

The Role of Self-Compassion in Effective Stress Processing – A Multimethod Approach

by

Christina Ewert

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy



Faculty of Human Sciences

University of Potsdam

January 2023

Unless otherwise indicated, this work is licensed under a Creative Commons License Attribution 4.0 International.

This does not apply to quoted content and works based on other permissions.

To view a copy of this licence visit:

<https://creativecommons.org/licenses/by/4.0>

First Supervisor: Prof. Dr. Michela Schröder-Abé

Second Supervisor: Prof. Dr. Florian Weck

Potsdam, 31th of January 2023

Published online on the

Publication Server of the University of Potsdam:

<https://doi.org/10.25932/publishup-60748>

<https://nbn-resolving.org/urn:nbn:de:kobv:517-opus4-607486>

Acknowledgement

This doctoral thesis was funded by a fulltime scholarship of the Potsdam Graduate School (PoGS). Thus, I would like to thank the PoGS for their financial support.

Furthermore, I would like to thank several people who supported the process of this dissertation. Without them, I would not have been able to finalize this project.

First, I would like to thank my supervisor Prof. Dr. Michela Schröder-Abé for her professional and emotional support during the last five years. I want to express my deep gratitude for always giving me the opportunity to develop and implement my own research ideas. Thank you for being interested in my research, for your good advice, your humor, your kindness and your sharing of knowledge about personality research with me. It has always been a pleasure.

I also would like to thank my student team at the Department of Differential Psychology and Diagnostics for their helpful input as well as their support in recruiting, designing the studies, data analyses and advice in writing – Anabel Büchner and Annika Vater, without you a completion of this PhD project would have hardly been possible.

Moreover, I would like to thank my family who supported me in engaging in studying Psychology and has come along with me throughout my whole academic life.

Especially, I would like to thank Cosma Hoffmann for being my PhD-buddy and such a good friend as well as best aunt for my kids. I know that I can always count on you.

Finally, my special thanks go to my life partner and best friend Jan Krause. Thank you so much for all your emotional, motivational, and technical support during the last years. I am very grateful for always having you by my side and watching how important it is for you, that we can equally strive for our life goals.

The present doctoral thesis is based on the following studies:

1. Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness*, *12*(5), 1063–1077. <https://doi.org/10.1007/s12671-020-01563-8>.
2. Ewert, C.; Buechner, A.; Schröder-Abé, M. (2022). *The mediating role of stress processing in the relation of self-compassion and affective well-being: Evidence from two longitudinal studies*. [Manuscript submitted for publication]. Department of Personality Psychology and Psychological Assessment, University of Potsdam.
3. Ewert, C., Hoffmann, C.F.A. & Schröder-Abé, M. (2022). Stress processing mediates the link between momentary self-compassion and affective well-being. *Mindfulness*. <https://doi.org/10.1007/s12671-022-0195>

Table of Contents

ABSTRACT.....	7
INTRODUCTION	8
1 SELF-COMPASSION	12
2 SELF-COMPASSION AND AFFECTIVE WELL-BEING	16
2.1 Forms of Well-Being	17
2.2 Relations between Self-Compassion and Affective Well-Being	18
3 STRESS PROCESSES AS MEDIATORS IN THE RELATION BETWEEN SELF-COMPASSION AND AFFECTIVE WELL-BEING	19
3.1 The Transactional Model of Stress.....	20
3.2 Self-Compassion, Perceived Stress and Affective Well-Being	27
3.3 Self-Compassion, Coping Responses and Affective Well-Being.....	29
4 SUMMARY AND RESEARCH QUESTIONS	32
4.1 Over view of the meta-analysis.....	36
4.2 Over view of Study 1 and Study 2: Longitudinal Studies	39
4.3 Over view of Study 3: Ambulatory Assessment Study	42
5 META-STUDY	45
6 STUDY 1 AND STUDY 2: LONGITUDINAL STUDIES	87

7	STUDY 3: AMBULATORY ASSESSMENT STUDY.....	127
8	GENERAL DISCUSSION.....	165
8.1	A Deeper Understanding of the Relation between SC, Stress Perception, and Coping with Stressful Situations	165
8.2	The Role of Stress Processing in the Relation of Self-Compassion and Affective Well-Being.....	167
8.3	Strengths, Limitations and Further Research	169
8.4	Practical Implications	175
8.5	Conclusions	175
9	REFERENCES	177
	EIDESSTATTLICHE ERKLÄRUNG	193

Abstract

Background: The concept self-compassion (SC), a special way of being compassionate with oneself while dealing with stressful life circumstances, has attracted increasing attention in research over the past two decades. Research has already shown that SC has beneficial effects on affective well-being and other mental health outcomes. However, little is known in which ways SC might facilitate our affective well-being in stressful situations. Hence, a central concern of this dissertation was to focus on the question which underlying processes might influence the link between SC and affective well-being. Two established components in stress processing, which might also play an important role in this context, could be the amount of experienced stress and the way of coping with a stressor. Thus, using a multi-method approach, this dissertation aimed at finding to which extent SC might help to alleviate the experienced stress and promotes the use of more salutary coping, while dealing with stressful circumstances. These processes might ultimately help improve one's affective well-being. Derived from that, it was hypothesized that more SC is linked to less perceived stress and intensified use of salutary coping responses. Additionally, it was suggested that perceived stress and coping mediate the relation between SC and affective well-being.

Method: The research questions were targeted in three single studies and one meta-study. To test my assumptions about the relations of SC and coping in particular, a systematic literature search was conducted resulting in $k = 136$ samples with an overall sample size of $N = 38,913$. To integrate the z -transformed Pearson correlation coefficients, random-effects models were calculated. All hypotheses were tested with a three-wave cross-lagged design in two short-term longitudinal online studies assessing SC, perceived stress and coping responses in all waves. The first study explored the assumptions in a student sample ($N = 684$) with a mean age of 27.91 years over a six-week period, whereas the measurements were implemented in the GESIS Panel ($N = 2934$) with a mean age of 52.76 years analyzing the hypotheses in a population-based sample across eight weeks. Finally, an ambulatory assessment study was designed to expand the findings of the longitudinal studies to the intraindividual level. Thus, a sample of 213 participants completed questionnaires of momentary SC, perceived stress, engagement and disengagement coping, and affective well-being on their smartphones three times per day over seven consecutive days. The data was processed using 1-1-1 multilevel mediation analyses.

Results: Results of the meta-analysis indicated that higher SC is significantly associated with more use of engagement coping and less use of disengagement coping. Considering the relations between SC and stress processing variables in all three single studies, cross-lagged paths from the longitudinal data, as well as multilevel modeling paths from the ambulatory assessment data indicated a notable relation between all relevant stress variables. As expected, results showed a significant negative relation between SC and perceived stress and disengagement coping, as well as a positive connection with engagement coping responses at the dispositional and intra-individual level. However, considering the mediational hypothesis, the most promising pathway in the link between SC and affective well-being turned out to be perceived stress in all three studies, while effects of the mediational pathways through coping responses were less robust.

Conclusion: Thus, a more self-compassionate attitude and higher momentary SC, when needed in specific situations, can help to engage in effective stress processing. Considering the underlying mechanisms in the link between SC and affective well-being, stress perception in particular seemed to be the most promising candidate for enhancing affective well-being at the dispositional and at the intraindividual level. Future research should explore the pathways between SC and affective well-being in specific contexts and samples, and also take into account additional influential factors.

Introduction

"Stress is not what happens to us. It's our response to what happens. And response is something we can choose." – His Holiness the 14th Dalai Lama

We must face various acute and chronic demands influencing us physiologically and psychologically throughout our whole life. Hectic rush at work or home: Stress has developed into a 'widespread disease'. According to a study by the Techniker Krankenkasse (2021), four out of ten Germans feel that their life is extremely stressful and demanding. In handling this, people show remarkable interindividual and intraindividual differences that have fundamental consequences for their well-being (Larsen, 2000). There has been ongoing research on personality factors that have a protective function for such demanding life events, and more recently, there has been a growing interest in far eastern concepts. Drawing on Buddhist philosophy, Kristin Neff introduced the concept of SC as an alternative, compassionate way of looking at oneself twenty years ago (Neff 2003a, 2003b). SC can be described as a self-caring attitude when facing painful situations in life, entailing full openness to one's own sorrowful experience without avoiding or denying it, revealing an intention of caring and healing one's own suffering. During the last two decades, empirical studies have established the mental health benefits of SC. Thus, a large body of research has already shown that high levels of SC have protective effects on mental health and numerous well-being components (e.g., Hollis-Walker & Colosimo, 2011; Zessin et al., 2015). A recent meta-analysis by Zessin et al. (2015) clearly demonstrated and summarized the positive effects of SC on various well-being outcomes, such as satisfaction with life, happiness, and affective well-being. Due to the theoretical rationale of this PhD thesis, the focus was set on affective well-being, which is considered as the momentary presence of pleasant and absence of unpleasant feelings (Lazarus & Folkman, 1984; Diener, 1984). Although positive effects of SC on affective well-being are well-established and health programs working with SC and related constructs are

currently booming in our society, research still questions the processes through which SC has salutary effects on affective well-being under stressful circumstances (e.g., Hamrick & Owens, 2018; López et al., 2018; Zessin et al., 2015). Common research on stress processing has widely shown that two key factors, namely an individual's perception of stress and the way of coping with demanding situations, are related substantially to aspects of affective well-being (e.g., Arch & Craske, 2006; Davies & Clark, 1998; Folkman et al., 1986; Penley & Tomaka, 2002). Hence, the present PhD thesis also aims at investigating these two primary ways, through which SC might produce its beneficial effects on affective well-being: First of all, SC could be one key component helping to construe a painful experience as less harmful, and thus, resulting in less perceived stress (e.g., Arch et al., 2014; Chishima et al., 2018; Sirois et al., 2014). Secondly, past research has also suggested that SC could help taking up a balanced perspective to threatening situations and facilitate coping more adaptively (more use of engagement and less use of disengagement coping) with painful experiences (e.g., Chishima et al., 2018; Costa & Pinto-Gouveia, 2013; Gillanders et al., 2015). Therefore, this PhD thesis suggests that stress processing, i.e., perceived stress and coping responses, mediate the association of SC with affective well-being.

Indeed, research of the past two decades has revealed a large body of evidence on salutary links between SC and engagement as well as disengagement coping responses (e.g., Allen & Leary, 2010; Gillanders et al., 2015). However, given the complexity of the construct coping and inconsistent results in the relation of SC and coping on the level of single strategies, a systematic review of the relation between SC and coping was still missing. Thus, to give a deeper insight into this relation, the first objective of this doctoral dissertation was to examine the interplay between SC and different forms of engagement and disengagement coping responses in a systematic way via a meta-study (meta-analysis).

Several studies have already found that a self-compassionate attitude is associated with healthier stress processing (i.e., less perceived stress and more salutary coping

responses), as well as have even suggested that either stress perception or coping responses could be processes underlying the association between SC and affective well-being (e.g., Arch et al., 2014; Fresnics & Borders, 2016; Gillanders et al., 2015). However, past research has been restricted in a number of ways: On the one hand, relations have almost exclusively been examined in cross-sectional designs that have been argued being insufficient, especially for exploring mediation effects (Selig & Preacher, 2009). On the other hand, former studies mainly relied on student samples or other very specific mostly clinical populations, which might restrain the generalization of the results (e.g., Gillanders et al., 2015; Neff et al., 2005; Sirois et al., 2014). In addition, past research has often missed deriving their suggestions from a broader theoretical model. Referring to Lazarus' transactional model of stress (Lazarus & Folkman, 1984), another objective of this doctoral dissertation was to take into account these limitations while investigating the relations between SC and stress processing variables, as well as explore the relevance of stress perception and coping responses as two potential mediating mechanisms in the association between SC and affective well-being with a longitudinal approach (Study 1 and Study 2).

Past research has also concentrated on relations of dispositional SC, meaning that individuals with higher levels of SC usually handle threatening situations more adaptively and experience increased affective well-being (e.g., Adams & Leary, 2007; Neff et al., 2005; Stutts et al., 2018). Taking into account that variations of behavior between individuals always go along with substantial variations within an individual over occasions and contexts, the effects of SC can also be examined at the individual level of fluctuations across situations (e.g., Fleeson & Jayawickreme, 2015; Moskowitz et al., 1997). However, levels of SC, affective well-being as well as underlying mechanisms at the within-person context have rarely been investigated until now and might differ from reported effects at the inter-individual level. Thus, it can also be suggested that individual differences in momentary levels of SC could be associated with momentary levels of perceived stress and the use of

coping responses, influencing affective well-being within this individual across different situations. Consequently, to further understand if the relations can be transferred to the within-person level, the last study (Study 3) of this dissertational project aimed at examining assumed links between momentary levels of SC, perceived stress, coping and affective well-being, and whether perceived stress and healthier coping responses are mediators in the relation between momentary SC and affective well-being using an ambulatory assessment approach.

A theoretical overview of all relevant constructs and their relations is given in the following paragraphs, taking into account the research questions of this doctoral dissertation. In the first chapter, an introduction to the central construct SC is given. It starts with a common definition of SC and leads to a detailed description of this construct for a deeper insight into central assumptions concerning the salutary nature of SC.

The second chapter aims to present information about the link between SC and affective well-being. The first paragraph starts with a brief overview of a prominent description of well-being, integrating different forms of well-being and ending with a definition and a short description of affective well-being implemented for the present PhD project. In addition, central assumptions about associations of SC and affective well-being components are provided in the second paragraph, giving a first integration of mechanisms and processes which may account for this relation.

The third chapter focuses on the relevance of stress processing, i.e., perceived stress and coping as underlying mechanisms in the relation of SC and affective well-being proposed by the transactional model of stress. It starts with a theoretical foundation about the main assumptions of the transactional model of stress, integrating subsections about the relevance of stress perception and coping responses as two key mechanisms in the etiology of stress processing in the following. Theoretical background of both processes is also presented in more detail to give a deeper understanding of how the complex structure of stress processing

is adopted for this PhD project. Moreover, two other subsections of this chapter illustrate the relevance of both mechanisms in the link between SC and affective well-being and give an overview of findings from previous studies concerning associations of SC, stress processes, and affective well-being, investigated with different methodological approaches. It is explained, in which way not only stress perception, but also healthier coping responses might play a major role in the relation with SC. Finally, at the end of each subsection, reasons are given for why they can be considered central mechanisms mediating the link between SC and affective well-being.

Chapter four aims to answer the research questions that were investigated by the PhD project. The following three chapters provide a short description of the studies included in this doctoral dissertation to gain evidence regarding the research questions. Thus, chapter five consists of the meta-study; a meta-analysis of the relation between SC and coping to structure previous findings. In chapter six, two studies (Study 1 and Study 2) are included, investigating the relevance of perceived stress and coping as potential mediators in the link between SC and affective well-being in two longitudinal samples. Chapter seven covers the last study (Study 3) of this PhD project which aimed to transfer the findings of the two longitudinal studies into the everyday context by examining the relations of momentary SC and affective well-being, as well as the mediational role of stress processes in this link at the within-person level.

Finally, in the eighth chapter, a summary of all studies is given, leading to a discussion of the central results. The last chapter closes with strengths and limitations of the findings as well as with practical implications.

1 Self-Compassion

The construct SC has exponentially gained importance in psychological research as well as in therapeutic practice since its introduction into the scientific community by Kristin Neff in 2003. In a quite recently published review paper, Bluth and Neff (2019) found over 1600

studies and dissertations on positive health benefits of SC on Google Scholar. Around half of them had appeared within the last few years. In Buddhist philosophy and practice, though, SC has a long tradition and is seen as inseparable from the compassion an individual has for others. Thus, Neff (2003a) orientated the concept of SC on compassion directed towards others. It can be described as not closing off oneself from one's own suffering or turning away from it, but rather to consciously perceiving it, opening up to it, and even letting oneself being touched by it. At the same time, the desire to alleviate one's own suffering and to be kind to oneself arises. Furthermore, it also goes along with a non-judgmental perception of one's own pain and fallibility by considering it as a part of a general human experience. By that, Neff means the feeling of forgiving oneself in terms of being human, which is naturally accompanied by limitations and imperfections. This does not mean that SC leads to passivity, complacency and self-pity. In fact, the contrary: Neff (2003a) argues, that through deep understanding and patience that an individual shows to one's own mistakes, a self-compassionate attitude can create an emotional safe space and provides liberation from maladaptive patterns of thinking, feeling and acting. Consequently, the only difference between compassion for others and compassion for oneself is that our own person becomes the target of caring in suffering moments. This is also in line with Buddhist philosophy, which considers compassion for others as well as for oneself as the central component of a blissful life (Davidson & Harrington, 2002). Finally, SC can be described in terms of three interwoven facets, each with a positive and a negative pole (Neff, 2003a), which are presented briefly in the following:

Self-kindness vs. self-judgment. Individuals are often inclined to judge themselves or others quickly. While other people tend to be rated somewhat milder, individuals are especially critical with themselves and their own flaws. Research has shown that reports from others via questionnaires turned out almost always more positive than self-reports of a person (Schahn & Amelang, 1992). Self-judgment often feels more natural to us than comforting

oneself when dealing with suffering or one's own flaws. Thus, people are not even aware of how to treat themselves differently, which can often be a source of their own suffering (Brown, 1999). The opposite pole to this is self-kindness, which includes forgiveness, empathy, sensitivity, warmth, and patience to all aspects of the self, which goes hand in hand with an unconditional self-affirmation and complete acceptance of one's own fallibility. Thus, especially in times of failure, it helps to facilitate meeting one's own suffering with active attempts of consolation and a deep understanding of one's imperfections, accompanied by the need to care for and heal oneself.

Common humanity vs. Isolation. Another basic Buddhist idea presumes that people are all closely connected and that it is illusory to be separated from others because we deeply long for contact with others constantly (Brown, 1999). Thus, common humanity can be seen as another central aspect of SC and facilitates feelings of connectedness to others in moments of suffering. According to Neff (2003a) it contains the ability to recognize that other people also make mistakes, encounter comparable difficulties and blows of fate in emotionally challenging situations. One's own pain and weaknesses are not viewed as something special, but rather as a natural part of life, which sometimes happen to every human being inevitably during the course of one's life. However, in times of pain and frustration, people tend to isolate themselves from others. They often feel ashamed of their flaws and suffering and want to withdraw and hide their "true selves". Reminding yourself that all people are compelled to go through painful experiences and have survived worse things, helps to detach from self-pity and one's own tunnel vision of an individual's painful experience and thus counteracts feelings of isolation. By classifying suffering in a more extensive social context, isolation can be diminished and feelings of connectedness with other people might be created (Neff & Germer, 2017).

Mindfulness vs. Over-identification. The concept of mindfulness has its roots in Buddhism and is often considered as the core of other contemplative traditions, in which

conscious attention is purposefully practiced in order to promote self-knowledge and compassion (Brown & Ryan, 2003). According to Neff (2003a), mindfulness means experiencing the present moment deeply in times of failure without going through harsh self-assessments or diverting worries about the past or future. Instead, mindfulness is characterized by a detached, accepting attitude towards one's own painful experience. By carefully perceiving your own thoughts and sensations, space opens up for conscious, non-reactive behavior (Neff & Beretvas, 2013). However, mindfulness of one's own experience can be thwarted by two other alternatives: over-identification with or avoidance of painful conditions. Over-identification means someone is completely absorbed by their own limitations or negative feelings, ultimately resulting in a vicious circle of pessimistic thinking and negative mood (Neff & Vonk, 2009). Thus, a person who broods or over-identifies tends to only focus on one's own negative thoughts and feelings in a stressful situation and, therefore, is less open to alternative, new information and more positive points of view (Whitmer & Gotlib, 2013). The other extreme is the avoidance of painful experiences, thoughts and emotions (Kabat-Zinn, 2003; Neff, 2003a). Research on this has already shown that negative feelings are often not being processed sufficiently but rather intensify. Thus, a deeper understanding of one's own feelings might be undermined in the long run leading to less mental health (Germer & Neff, 2013). Based on this, mindfulness can be described as being in a good balance between these two extremes while experiencing painful conditions and, therefore, is crucial for improved affective wellbeing and mental health (Neff, 2003a).

Thus, the components of SC can be described as three strongly interrelated components that are always accompanied by each other during painful times (Barnard & Curry, 2011). Although Neff (2003a) stated that every facet has distinct features, they still go hand in hand and can reinforce each other. People who are more caring and understanding of themselves could experience their own negative thoughts and feelings as less embarrassing. Consequently, they could tend to open up to others more easily rather than withdraw from

other people under stressful circumstances. They are more likely to share their suffering with others and acknowledge that others experience similar demands and challenges (Brown, 1999). Furthermore, a self-accepting and patient attitude in a painful moment help to engage in mindful awareness of oneself and the situation instead of identifying too strongly with it or tending to avoid negative experiences. Feelings of social connectedness to others might also facilitate treating oneself less harshly and shed another light on one's own fallibility, acknowledging it as rather something given to all people. Furthermore, people with higher social connectedness also possibly tend to treat themselves with the same kindness with which they face others. Lastly, common humanity could help to consider one's own self from a more distant point of view and, thus, to engage into more mindfulness towards one's own weaknesses, without avoiding them or over-identifying with them (Barnard & Curry, 2011). Vice versa, a balanced view of one's own painful experiences helps to distance from upcoming negative feelings and thoughts. This view might help to classify these experiences into a broader social context, which eventually could result in higher levels of common humanity and self-kindness. Thus, it is argued that one can only be self-compassionate, when all three components are activated (Barnard & Curry, 2011; Neff, 2003b). In summary, these components described above result in an attitude towards oneself that brings openness to one's own suffering in the face of difficult life situations without experiencing the need to avoid suffering or to close yourself off from them accompanied by the intention to take care of and heal oneself.

2 Self-Compassion and Affective Well-Being

According to Neff's theory (2003b), it seems obvious that more self-compassionate individuals can increase their mental health and well-being under challenging situations much easier than those with lower levels of SC. By adopting a compassionate attitude towards oneself rather than harsh self-judgment, one avoids becoming caught off guard by negative

feelings and opens up to positive emotions more effortlessly in painful situations or while experiencing personal failure. Thus, a detailed summary of research to the link of SC is presented in subsection 2.2. Affective well-being is briefly introduced and further classified into the broader well-being literature in subsection 2.1.

2.1 Forms of Well-Being

Research on the concept of well-being has developed dynamically over the past three decades. A large number of researchers from different fields engaged in this topic to find a satisfactory definition of well-being (Diener et al., 2018). However, there does not exist an appropriate, all-encompassing definition of well-being to date. Nevertheless, two very well-established ways of looking at well-being are presented in the following:

On the one hand, the model of *psychological well-being* introduced by Ryff (1989) can be described using six different components (self-acceptance, environmental mastery, purpose in life, positive relations with others, personal growth, and autonomy). It is based on the general assumption that individuals want to blossom in challenging life situations and feel comfortable, when they are able to consider these components as fulfilled throughout their lives. Chen et al. (2013) summarized these assumptions as "fulfillment of human potential and a meaningful life" (p. 1034).

Subjective well-being, on the other hand, focuses on the hedonistic aspect of well-being and is a collective term for how people evaluate their life and emotional experiences: Diener (1984) describes two relatively independent core components – cognitive and affective well-being. Cognitive well-being refers to general assessments of life. It is often summarized as satisfaction with life or satisfaction with one's own health, whereas affective well-being can be understood as specific emotional states in a reaction to events or living conditions. Thus, affective well-being can be described as the extent of momentary presence of positive or pleasant feelings, such as cheerfulness or joy, and the absence of negative or uncomfortable emotions, such as shame or anger.

Due to the theoretical focus on affect regulation (Lazarus & Folkman, 1984), the primary aim of this PhD thesis was to take into account the underlying mechanisms of SC and affective well-being, relations between SC and other forms of well-being are less strongly illuminated in the following section.

2.2 Relations between Self-Compassion and Affective Well-Being

In psychological research it is commonly recognized that SC could be one protective factor for mental health. Thus, a large number of research findings have already indicated that SC is an essential variable for the development and maintenance of mental health and well-being (e.g., Körner et al., 2015; Krieger et al., 2016; Marshall & Brockman, 2016; Zessin et al., 2015). From one perspective, individuals with higher levels of SC also reported more resources and positive experiences, such as positive affect, curiosity, wisdom, personal initiative, and optimism (Neff et al., 2007a; Neff & Vonk, 2009). From the other perspective, research has indicated that associations between SC, and negative affect variables, such as anxiety, depression and habitual negative affect, consistently result in negative correlations (e.g., Bluth et al., 2016; Johnson & O'Brien, 2013; Neff & McGehee, 2010; van Dam et al., 2011). Furthermore, studies suggest that a more self-compassionate attitude can also help to reduce specific negative emotions, such as shame and guilt, after an induction of negative affectivity (Johnson & O'Brien, 2013; Woods & Proeve, 2014), negative feelings after a failed crash diet (Leary et al., 2007) as well as fear of one's weaknesses after confronted with an ego-threat in a laboratory setting (Neff et al., 2007b).

Considering SC interventions investigating the protective effects of SC, short-time exercises to induce SC seem to decouple experienced responsibility for self-inflicted aversive events and arising feelings. In a study by Leary and colleagues (2007), participants should think about a past unpleasant event with personal negligence. Compared to subjects from the control group, individuals from the SC induction group experienced significantly less negative affect while, at the same time, an increase of one's own perceived responsibility.

There is also evidence that broader mindful SC programs effectively improving affective well-being and other mental health variables (Arch et al., 2014; Germer & Neff, 2013). For example, in a randomized controlled study evaluation of the eight-week Mindful Self-Compassion Program by Germer and Neff (2013), the protective effects of SC were investigated. Results indicated a significant increase in SC, compassion for others, mindfulness and life satisfaction, positive affectivity as well as decreased depression, anxiety and perceived distress among course participants compared to the waiting list control group. The effects could even be found six months as well as one year after the intervention program.

Finally, the protective effects of SC on affect and other well-being components could also be supported meta-analytically. In their meta-analysis between SC and various psychopathology variables based on data from over 4,000 test subjects, MacBeth and Gumley (2012) found strong negative correlations between SC and depressive symptoms as well as fear. Furthermore, another meta-analysis by Zessin and colleagues (2015) examined the findings of single studies of SC in relation to different concepts of well-being using data from over 16,000 test subjects and over 70 single studies: SC showed strong associations with affective well-being as well as other related well-being components, such as happiness and life satisfaction. Additionally, a subsample of studies even showed a causal effect of SC on well-being ($r = .47$).

Overall, broad evidence indicates that a self-compassionate attitude helps maintain positive affect and reducing negative affect in times of pain and failure, and thus, might form an essential protective factor for mental health.

3 Stress Processes as Mediators in the Relation between Self-Compassion and Affective Well-Being

As mentioned above, research has already found that dispositional SC is positively associated with affective well-being and other well-being components, as well as a protective effect on

overall well-being (for a review, see Zessin et al., 2015). However, the question about the underlying mechanisms between the link of SC and affective well-being was raised.

Based on Lazarus' transactional theory of stress (Lazarus, 1966), there has already been extensive evidence that two key factors are decisive for emotion regulation and, therefore, for improving affective well-being – *stress appraisals* and *coping* (e.g., Arch & Craske, 2006; Davies & Clark, 1998; Lazarus & Folkman, 1986; Weinstein et al., 2009). Hence, this work focuses on these two primary ways by which SC could unfold its beneficial effects in the face of challenges or stressful events. So far, associations between SC and stress (and SC and coping) have mainly been investigated on a cross-sectional level and are described in more detail below. Furthermore, the concepts of stress and coping in terms of Lazarus' stress theory are introduced and discussed at greater length regarding their connections with SC and affective well-being.

3.1 The Transactional Model of Stress

How people react cognitively and emotionally to challenges and demanding events varies greatly from person to person or even within a person over the course of a day, depending on one's daily condition. On the one hand, objective stressors exist, which can be described as all environmental conditions automatically triggering an individual's stress reaction, such as loud noises. On the other hand, it often depends on the individual subjective assessment of which circumstances or stimuli are perceived as threatening or challenging (Lazarus, 1966). In his famous cognitive, transactional stress theory, Lazarus (1966) assumed that not primarily objective stressors are responsible for how an individual responds to stress, but rather in which way it perceives or assesses potentially threatening circumstances. According to this model, cognitive evaluation processes occur between the stressor and the stress reaction, which are related to two different aspects of the situation: relevance and resources (Lazarus & Folkman, 1984). Hence, psychological stress relates to a relationship with the environment, which an individual assesses as significant in terms of his or her well-being, but at the same

time makes demands on the individual, which claim or overwhelm the ability to cope (Lazarus & Folkman, 1986). According to this view, stress arises from a dynamic (transactional) interplay of external loads and internal evaluation processes.

3.1.1 Stress Appraisals and Perceived Stress

Stress appraisals, therefore, affect all cognitive processes in which individuals judge events as potentially stressful. These evaluations often change the emotional meaning of a situation. Due to that, experiencing stress does not only arise from the event itself but is also significantly influenced by the individual assessment. In terms of *primary stress appraisals*, the individual assesses the relevance of the situation concerning one's own well-being or the achievement of one's own goals. If the situation is judged to be irrelevant-neutral, it does not require any effort, and no emotion arises; if it is rated as relevant and positive, it is followed by pleasant emotions. If the situation is relevant to a person and an individual experiences a risk of harm at the same time, stress arises (stress-related negative assessment, Lazarus & Folkman, 1986).

The quality and intensity of stressful emotions depend not only on primary appraisals but also on *secondary appraisal* processes. Lazarus and Folkman (1986) differentiate secondary appraisals into three possible aspects: challenge (the situation harbors a certain risk, but if it is successfully managed, it also can have beneficial outcomes), threat (damage or loss is most likely and anticipated) or damage or loss that has already occurred. All three categories require a certain use of resources: The stressor must be tolerated, minimized or eliminated, as well as one must also deal with the stress response the stressor has already caused. Thus, an individual must evaluate if and what needs to be done to avert the damage or how to draw something beneficial out of the situation – the central question behind it is: “(How) can I control the situation?” If the answer is ‘yes’ and an individual perceives enough resources available to cope with the stressor, stressful feelings turn out to be positive. On the other hand, negative stress is felt when the situational demands exceed the available resources

based on one's own evaluation, and thus, the occurrence of damage or loss is assessed as likely. Consequently, this can result in a cascade of more negative stress emotions, such as anger, anxiety, and depression.

In summary, the amount of perceived stress not only depends considerably on the subjective assessment of the situation (primary appraisal process), but also on the assessment of the available resources, and thus, the perceived controllability of the situation (secondary appraisal process). However, even if the words "primary" and "secondary" suggest something else, the two evaluation processes run in parallel and influence each other, so this separation is rather theoretical and can hardly be examined empirically. Thus, it is neglected in the following. Furthermore, in the context of this work, it is particularly interesting to what extent a situation is assessed as negative or challenging, thus leading to an increased experience of stress (Gross, 2007). For more in-depth explanations of the transactional stress model and associated evaluation processes, also see the monograph 'Emotion and Adaptation' (Lazarus, 1991).

3.1.2 Coping

Despite stress appraisals, another vital aspect of dealing with stress is *coping*. If resources are assessed as being insufficient, a stress reaction is triggered and coping processes are needed. Once a stressful emotion has occurred, the affected individual tries to ease the stress by diminishing the stressor or accompanying negative emotions to re-establish one's inner balance. Lazarus and Folkman (1984) defined coping in their transactional model as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). In more detail, an emotional response to the stressor firstly includes an individual's tendency to action, i.e., the intuitive need to act in a certain way, such as attacking when angry, crying when sad or fleeing when fearful (Lazarus, 1991). In many demanding situations, however, individuals are flexible enough to suppress the initial tendency to act and

are able to use a variety of possible coping strategies rather than act only intuitively, which probably leads to better results in the long run. Thus, coping efforts can influence further primary and secondary appraisal processes (i.e., reappraisals) leading to re-evaluating whether new information has altered the interaction between their individual and environmental conditions. Since Lazarus' and Folkman's description (1984) of coping, the construct has been investigated excessively and is now interpreted as regulating a wide range of functions in reaction to stress (Compas et al., 2017).

In their review article, Skinner et al. (2003) identified over 400 individual coping strategies. So far, psychological research has suggested several theoretical options to classify the broad range of coping (for an overview, see Compas et al., 2001; Compas et al., 2017). However, there is currently no consensus on which taxonomy should be preferred, as none of these classification systems integrate all coping strategies or can fully take into account the complexity of the construct coping (e.g., Carver and Connor-Smith, 2010; Compas et al., 2001; Skinner et al., 2003). Nevertheless, it is a popular approach to categorize coping into a hierarchical structure with two broader dimensions for which an interchangeable nomenclature can be found in literature: Most more recent research differentiates between the terms *engagement* and *disengagement coping*, whereas other authors use “adaptive and maladaptive coping” or “approach and avoidance coping” instead. Thus, these three two-dimensional distinctions can rather be considered as synonyms (e.g., Carver & Connor-Smith, 2010; Compas et al., 2017; Connor-Smith & Flachsbart, 2007). In this work, the terms engagement and disengagement coping were used as this rather seems to be a broader classification including also approach and avoidance coping responses. These are introduced in more detail in the following subsection. Additionally, another common, more classical taxonomy of coping - namely problem-focused vs. emotion-focused coping – (e.g., Carver & Connor-Smith, 2010; Folkman & Lazarus, 1988; Lazarus & Folkman, 1986) is also integrated briefly. Possible relations with SC are presented in section 3.3.

3.1.2.1 The Structure of Coping

Engagement coping is a type of coping including strategies, which help with handling a stressful situation or accompanying emotions actively, and thus, involve a cognitive, emotional, or behavioral ‘turning toward’ stressful situations (e.g., positive reframing and active coping). Therefore, they contribute to finding better solutions for problems and healthier affective well-being in the long-term. On the contrary, disengagement coping reflects a defensive form of regulation that involves strategies to escape from stressful stimuli (e.g., behavioral disengagement), to ignore them or to perceive them in a distorted manner (e.g., denial). Thus regarding long term solutions, trying to evade stressors or associated emotions can be considered rather dysfunctional (e.g., Carver & Connor-Smith, 2010; Compas et al., 2017; Connor-Smith & Flachsbart, 2007; Roth & Cohen, 1986).

The differentiation between engagement and disengagement coping emphasizes the orientation toward or away from a stressful stimulus and strongly overlaps with another common taxonomy of coping. Early on, Folkman, Lazarus, and colleagues (Folkman et al., 1986; Folkman & Lazarus, 1988) also differentiate between two main functions of coping: On the one hand, problem-focused coping responses attempt to influence the source of a stressor and, on the other hand, emotion-focused coping responses attempt to reduce negative emotions associated with the stressor which is often further distinguished into emotional approach and emotional avoidance coping.

Problem-focused strategies aim to impact the stressful stimulus itself by eliminating it, e.g., ending an unhealthy relationship, or decreasing its threatening effects if removing is not possible, e.g., a student who actively prepares several hours a day for a big exam instead of engaging in many other activities. Problem-focused coping, such as active coping, typically comes along with higher affective well-being and long-term mental health and, thus, can be subcategorized under engagement coping (Carver & Connor-Smith, 2010).

Emotion-focused coping comprises a wide range of strategies that can help to regulate the acute negative emotions occurring in the context of stressful situations by emotional approach coping such as self-soothing strategies (e.g., seeking emotional support), or avoidance coping strategies such as neglecting stressful situations (e.g. denial) or focusing on negative thoughts (e.g., venting) (Schnider et al., 2007). Almost all emotion-focused strategies seem to be helpful in the short term; however, some of them clearly predict more dysfunctional long-term results (Connor-Smith and Flachsbart, 2007; Lazarus and Folkman, 1984). On the one hand, emotional approach coping can often produce salutary psychological outcomes in the long run and even lead to better psychological functioning than problem-focused strategies depending on the kind of a stressful situation. Thus, it might be especially helpful when a demanding event that has already occurred in the past and is unchangeable (e.g., the death of a partner) or the hazard is uncontrollable (e.g., a terminal disease). On the other hand, emotional avoidance coping might help in regulating acute negative emotions but does not impact a threat's possible effects in terms of long term solutions, and thus, is nearly always seen as dysfunctional in the end (Carver & Connor-Smith, 2010; Stanton et al., 2000). For example, avoiding preparing a presentation for a conference might result in better feelings for the moment, but also might cause more stress emotions afterwards, and might result in other negative consequences such as a bad presentation and worse reputation. Hence, emotional approach strategies (e.g., positive reframing) can be sub-categorized under engagement coping, whereas emotional avoidance coping strategies (e.g., denial) might seem effective when it comes to short-term emotion regulation; in the long term, however, they can be harmful (e.g., Carver & Connor-Smith, 2010; Schnider et al., 2007; Skinner et al., 2003), and thus, can be sub-ordinated as disengagement coping.

To summarize common ways to model the construct of coping, many approaches use a hierarchical structure similar to a pyramid when referring to coping (Compas et al., 2017; Connor-Smith and Flachsbart, 2007; Skinner et al., 2003). In respect of that, engagement and

disengagement coping can be imagined at the top of the pyramid as broad coping dimensions (Compas et al., 2017; Connor-Smith and Flachsbart, 2007), whereas individual coping strategies are always sub-categorized under one of the two broad coping approaches. On a further level in-between the two broad dimensions and single strategies, problem- and emotion-focused coping can be integrated as well. Thus, whereas disengagement coping only entails emotional avoidance coping, engagement coping is further differentiated into problem-focused coping and emotional approach coping. The first study of this work primarily aimed to investigate associations between SC and coping in more detail. Thus, for a visualization of the taxonomy and the wide range of single coping strategies, see Figure 1 of the meta-analysis (section 5 at p. 83).

In terms of single coping strategies, however, this PhD work mainly focuses on dominant forms of engagement and disengagement strategies which have been identified in common literature and, therefore, these are briefly mentioned in the following (e.g., Deisinger et al., 2003; Fontain et al., 1993; Fortune et al., 2002; Lyne & Roger, 2000; Weinstein et al., 2009): According to Weinstein and colleagues (2009) three central engagement strategies can be found in research: *Acceptance* of the immutability of stressful reality as well as one's own occurred limitations; *cognitive reinterpretation* of stressful situations in terms of taking a new perspective to negative outcomes that allows seeing good things in difficult situations or recognizing them as opportunities for personal growth (Lyne & Roger, 2000); as well as *active coping*, i.e., a form of coping which contains all actions of an individual that aim to influence the outcome of a situation directly (Fortune et al., 2002; Lyne & Roger, 2000). Different ways of conceptualizing disengagement coping strategies exist in research. So far, the most widespread opinion among researchers is to include mental and behavioral disengagement strategies as well as denial (Deisinger et al., 2003; Fontaine et al., 1993; Weinstein et al., 2009). *Behavioral disengagement* involves reducing all efforts to cope with the stressor, sometimes even ignoring or abandoning the goal to which the stressor is linked

to. It can also manifest in the personal desire to deliberately want to isolate one's own stressful thoughts and emotions from others (Carver et al., 1989); whereas *mental disengagement* includes turning away from the stressful experience by wallowing in daydreams or engaging in a more pleasant activity. *Denial* means active attempts to withdraw attention from an unpleasant situation, even by eluding the reality's status from an unpleasant situation (Connor-Smith & Flachsbarth, 2007). Last but not least, also the strategy self-blame, i.e., a cognitive process in which an individual attributes the occurrence of a stressful event to oneself (Carver et al., 1989), should be mentioned here due to the close connection to SC (Leary et al., 2007; Neff, 2003a).

As the central aim of this PhD project is to give a deeper insight into the relation between SC and stress processing, in the next two chapters the relations between SC, perceived stress and coping, as well as the current state of research are illuminated in a nutshell. Moreover, the constructs are also discussed as underlying mechanisms between the link of SC and affective well-being.

3.2 Self-Compassion, Perceived Stress and Affective Well-Being

Over the last years, research on SC and stress processing has increased immensely. The concept of SC is often presented as an individual's attitude facilitating to maintain a balanced perspective in times of pain and failure (Gilbert & Procter, 2006). Hence, SC might help stay aware of painful emotions with an open-hearted self-caring attitude instead of evading threatening feelings (Neff, 2003b; Costa & Pinto-Gouveia, 2013). This is also in line with the stress model of Lazarus (1966), as it takes into account that specific environmental and personal factors can affect stress appraisal processes (Lazarus & Folkman, 1984). Hence, higher SC can be considered as such a personal resource variable, as a more self-compassionate mindset enables to appraise painful events and individual's flaws as less threatening in light of a shared human experience (Neff & Dahm, 2015). Taken together, one can assume that SC is another core component that has a positive effect on the cognitive

evaluation of stressful events leading to less perceived stress, and thus, ultimately helps to regulate negative emotions, especially in terms of unexpected and uncontrollable life events (Neff et al., 2007).

Indeed, numerous studies involving participants, who had to deal with stressful or challenging life conditions, have already indicated that a higher level of SC is associated with less perceived stress and reduced negative emotions on a cross-sectional level (e.g., Krieger et al., 2013; van Dam et al., 2011). For example, one study has found that people with chronic diseases and high levels of SC reported less perceived stress over the past month compared to the chronically-ill participants with low levels of dispositional SC (Sirois et al., 2014). Moreover, in a study by Chishima et al. (2018), subjects high in SC reported stressful events as less threatening and more controllable.

Furthermore, this effect has also been found in experimental and intervention programs and different samples. For instance, in two short-term interventions to promote SC (Arch et al., 2014; Arch et al., 2016), participants perceived less levels of stress in response to the Trier Social Stress Test (Kirschbaum et al., 1993) directly after the test and after a short latent phase. In addition, a study showed that after a four-month yoga-based meditation course for students, participants only experienced less stress when their ability to be more self-compassionate had also improved (Gard et al., 2012). Studies with specific samples such as adolescent volunteers or employees produced similar findings (e.g., Biegel, 2010; Bluth et al., 2015; Edwards et al., 2014). Thus, it can be concluded that higher levels of SC decrease the perception of stress indicating a causal relation.

More recently, researchers have also started to investigate the underlying psychological processes behind the beneficial effects of SC on affective well-being. In terms of the assumed mediational effect of perceived stress between the relation of SC and affective well-being, research findings have already suggested that SC helps maintain an emotional balance in the face of stressful events (Brion et al., 2014). Indeed, first studies have already

demonstrated that dispositional SC can help to reduce negative emotions in everyday life through less perceived stress (Krieger et al., 2013). Overall, one can hypothesize that a self-compassionate attitude helps to appraise stressors as less threatening which leads to perceive less stress, and in turn, has a positive influence on affective well-being.

3.3 Self-Compassion, Coping Responses and Affective Well-Being

It has already been demonstrated that a more self-compassionate attitude throughout one's life influences not only appraisals of threatful situations and an individual's perception of stress but also the chosen strategies, when trying to cope with stress (Gilbert & Procter, 2006), and thus, the nature of stressors to which individuals are exposed (e.g., through protective self-care behaviors) as well as physiological and affective responses to stress (Finlay-Jones, 2017). Furthermore, SC is also described as a useful ability that facilitates a balanced perspective in times of pain and actively deal with stressful situations by activating self-caring behavior. This might help to overcome harsh self-criticism and related negative emotions of shame and self-condemnation. Instead, it can lead to compassion for one's imperfections and flaws which are typically human as well as more positive emotions. Thus, considering the nature of SC, it seems reasonable to assume that SC is linked with coping in many ways (Neff, 2003a; Neff et al., 2005). In their review article on SC and coping, Allen and Leary (2010) argued that individuals with high levels of SC are more likely to use increased engagement coping forms as well as decreased disengagement coping strategies in dealing with difficult situations, which one would typically expect to be associated with the construct SC such as positive reframing, acceptance or denial. Over the past decade, research on SC and coping has increased rapidly and SC has indeed shown positive associations with engagement coping forms and negative associations with disengagement coping forms (e.g., Crary, 2013; Gillanders et al., 2015).

In terms of engagement coping, it is reasonable that especially acceptance and positive reframing might be associated with SC, as people with high SC, on the one hand, rather adopt

a non-judgmental stance towards one's own suffering helping to accept conditions just as they are. On the other hand, they might deal with threatening situations more objectively rather than over-identifying with them because difficult experiences are considered as fundamental in everyone's life (Allen & Leary, 2010; Leary et al., 2007). Indeed, several research findings constantly indicated positive associations between SC and acceptance as well as SC and positive reframing in students' samples as well as clinical samples (e.g., Chishima et al., 2018; Ewert et al., 2018; Neff et al., 2005; Sirois et al., 2014). Moreover, as SC is linked to the desire to strive for oneself's best and minimize future suffering as much as possible, one could also expect that it is related to active coping. Whereas research findings in terms of salutary relations of SC and emotional-focused coping strategies, such as positive reframing and acceptance, were consistent (e.g., Adams & Leary, 2007; Costa & Pinto-Gouveia, 2013; Gilbert & Procter, 2006; Wong & Yeung, 2017); studies on the link between SC and certain problem-focused strategies, i.e., active coping or planning, showed inconsistent results (e.g., Chishima et al., 2018; Exline et al., 2016; Gillanders et al., 2015). Especially some older studies often reported no association between SC and active coping forms (for a review, also see Leary and Allen, 2010; Neff et al., 2005). These studies had often focused on past, non-changeable situations or life events such as chronic or potentially-lethal diseases. Thus, it might be questionable if active coping behavior that encompasses attempts to eliminate, change or avoid stressors might be less effective in those contexts resulting in restricted usage of such coping responses (e.g., Brion et al., 2014; Costa & Pinto-Gouveia, 2013; Sirois et al., 2014). However, many more recent studies found the suggested positive relation between SC and active coping behavior (e.g., Pinto-Gouveia et al., 2012; Sirois et al., 2014).

Referring to the relation between SC and disengagement coping responses, it can be assumed that having a self-compassionate attitude to one's own shortcomings is negatively associated with avoidance-oriented coping strategies as it involves engaging in a balanced perspective on suffering and results in painful thoughts and feelings. Consequently, being

more self-compassionate entails meeting one's own fallibilities with equanimity and a more realistic view of the self (Leary et al., 2007), while denying threatful situations thwarts a clear view on one's own experiences (Carver & Connor-Smith, 2010). Thus, the negative link between SC and denial has also been indicated in research (e.g., Ewert et al., 2018; Sirois et al., 2014). SC also leads to forgiving oneself for own weaknesses. While facing demanding situations, the need to suppress painful thoughts and feelings or identify too strongly with them is minimized, as feelings of emotional safety are released. Indeed, studies have demonstrated a negative link between SC and behavioral disengagement coping responses (e.g., Gillanders et al., 2015; Neff et al., 2005, Sirois et al., 2014). Moreover, SC can provide a benevolent and balanced stance to one's flaws rather than getting lost in harsh self-criticism. Thus, research also demonstrated that people with higher levels of SC engage in less self-blame (e.g., Hamrick & Owens, 2018; Rubin et al., 2012).

Furthermore, there are initial studies with mostly clinical samples and cross-sectional designs that indicated certain coping strategies as a mediator between SC and mental health as well as affective well-being: Disengagement strategies (more precisely: cognitive and behavioral disengagement as well as rumination) showed a mediating effect in the connection between SC and symptom severity in patients with major depression (Krieger et al., 2013). Moreover, research has demonstrated that various coping forms such as acceptance, avoidance, and problem-focused coping styles represent an additional factor that has a positive effect on the link between SC and the amount of experienced anxiety and depressive symptoms in chronic pain sufferers (Costa & Pinto-Gouveia, 2013). Mediation analyses showed that higher SC was associated with lower self-blame as well as less disengagement coping which, in turn, were associated with less posttraumatic symptoms such as negative emotions among survivors of a sexual assault (Hamrick & Owens, 2018).

Last but not least, a laboratory study, which was conducted as part of my diploma thesis, also gives empirical evidence for the assumptions of this PhD project. For this purpose,

105 subjects participated in a short mental-arithmetic task orientated towards the arithmetic exercise from the widely known Trier Stress Test (Kirschbaum et al., 1998), which represented a potentially threatening social-evaluative situation. Results supported the idea that the protective effects of SC on negative affect were mediated by lower levels of disengagement coping (i.e., denial) in a laboratory setting (Ewert et al., 2018). Thus, it can be assumed that higher levels in SC help to deal with difficult situations in a more adaptive way. Individuals with higher SC consider their own fallacies and failures in a more balanced perspective. Thus, negative emotions such as shame and self-condemnation can be transformed into more productive emotions of compassion for one's own human fallibility, ultimately leading to increased affective well-being. However, these findings are limited as they cannot be transferred to different populations and everyday contexts and need further investigation.

4 Summary and Research Questions

Since Kristin Neff's (2003a) introduction of the construct SC, research interest in the beneficial effects of this concept has grown immensely. Many studies have already shown that a compassionate attitude towards oneself can lead to increased affective well-being and mental functioning (MacBeth & Gumley, 2012; Zessin et al., 2015). Still, questions have been raised on how SC unfolds its protective effects on affective well-being and positive functioning (e.g., Ewert et al., 2018; Homan & Sirois, 2017; Zessin et al., 2015). It is commonly known that stress perception as well as the type of coping are two key regulatory components in the stress processing-affective well-being dynamic (Lazarus & Folkman, 1984). Thus, based on the transactional model of stress (Lazarus & Folkman, 1984), the underlying mechanisms for beneficial effects of SC on affective well-being may be found in stress processing. Many studies have demonstrated that SC is associated with a reduced experience of stress (MacBeth & Gumley, 2012) as well as increased engagement coping or

reduced disengagement coping (e.g., Neff et al., 2005; Gillanders et al., 2015). Hence, research showed that self-compassionate individuals appear to react more adaptively to demanding circumstances in terms of their stress perception and coping responses (e.g., Krieger et al., 2013; Neff et al., 2005), suggesting that both stress processes are working mechanisms of SC. However, past studies have been restrained in several ways:

In a review article on how self-compassionate people cope with challenging life events, Allen and Leary (2010) report studies that focus only on associations between SC and very few coping strategies (cognitive restructuring, active coping/problem solving, support seeking, avoidance and distraction from negative emotions), due to a lack of studies over a decade ago. They also found conflicting results for the relations between SC and some problem-focused strategies, such as active coping. Therefore, the first aim was to systematically examine the connection between SC and the complex construct coping in order to find out which strategies play a major role in the context of SC. In addition, most of the research used cross-sectional instead of longitudinal designs, which have been criticized for not being sufficient for investigating especially mediation effects (Cole & Maxwell, 2003; Selig & Preacher, 2009). Furthermore, many studies have only focused on specific (sub-) clinical samples (Gillanders et al., 2015; Sirois et al., 2014), limiting the generalizability of the findings. Consequently, one central goal of this PhD project was to further investigate the relations between SC, stress processing, and affective well-being in two longitudinal samples to answer the question if Neff's and colleagues' findings can be transferred to different longitudinal contexts and more general samples. Moreover, except for my own work, in which I investigated both - perceived stress and coping - at the same time in the context of SC and affect in a laboratory setting (Ewert et al., 2018), studies on SC only investigated either perceived stress or specific coping strategies as a mechanism underlying the link between SC and affective well-being. Therefore, in order to take into account both processes which might be accountable for the positive association between SC and affective well-being, stress

perception and broader coping forms should be investigated simultaneously in an overall model. Hence, controlling for their overlap was another sub-goal of this work. Finally, almost all past research viewed SC on a dispositional level (e.g., Arch et al., 2014, Ewert et al., 2018, Homan & Sirois, 2017). As an individual's behavior also depends on situational cues and is not necessarily expressed consistently across diverse situations that differ in meaning, personality variables such as SC have both trait and state-like properties (Zuroff et al., 2021). This is also in line with more recent personality theories conceptualizing traits as density distributions of states (Fleeson & Jayawickreme, 2015). Thus, individuals may feel and behave more or less self-compassionately at different points in time or across different situations. So far, very few studies have also encouraged to examine influences of momentary SC on stress processing and well-being variables at the within-person-level in future research (Kelly et al., 2016; Li et al., 2019). Thus, another sub-goal of the current work was to investigate the effects of momentary SC with respect to stress processing and affective well-being in daily life at the within-person level. Hence, the pivotal objective of my work was to shed more light on all missing points in more detail using a multi-method approach and to give an answer to the following research questions:

- a) Is SC associated with less perceived stress?
- b) Is SC linked to more use of engagement coping and less use of disengagement coping?
- c) Do perceived stress, engagement as well as disengagement coping mediate the relation between SC and affective well-being?

In consideration of the current state of research illustrated above, the following hypotheses were derived:

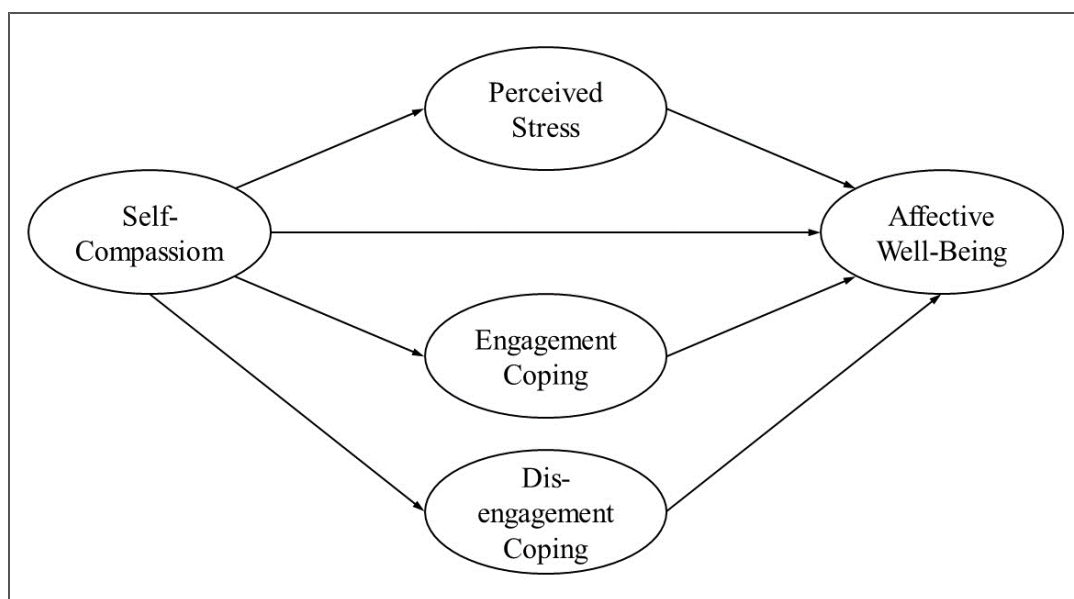
- (1) SC is linked to less perceived stress.
- (2) SC is associated with more use of engagement coping and less use of disengagement coping.

(3) Perceived stress, engagement, as well as disengagement coping mediate the relation between SC and affective well-being.

To give a better understanding of the assumed pathways. They are also illustrated in Figure 1.

Figure 1

Mediational model showing the assumed relations between SC and affective well-being with the three mediators perceived stress, engagement coping and disengagement coping.



More specifically, the three research projects utilized in this PhD thesis addressed the subsequent main research goals:

First, to gain a deeper understanding of the link between SC and the complex construct coping, the present meta-analysis wants to give an answer to the research question b) in more detail and examined the relation between SC and different forms of engagement (i.e., adaptive) and disengagement (i.e., maladaptive) coping in a systematic way (meta-study).

Second, to provide an answer to how SC is related to stress processing variables (i.e., perceived stress and coping) and especially illustrate the role of both - perceived stress and coping - as mechanisms underlying the relation between SC and affective well-being, SC,

perceived stress, engagement and disengagement coping, as well as affective well-being were investigated in two longitudinal studies (student vs. population-based sample) with three measurement waves each (Study 1 and Study 2: longitudinal studies).

Third, to give further understanding if the relations can be transferred to everyday experiences, the last study aimed to investigate all assumed hypotheses at the intra-individual level. Thus, the links between momentary levels of SC, perceived stress and coping as well as whether perceived stress and healthier coping responses are mediators in the relation between momentary SC and affective well-being were examined at the within-person level (Study 3: ambulatory assessment study).

4.1 Overview of the meta-analysis

Recent research on the relation between SC and coping with stressful situations has grown enormously over the last ten years, especially for less classical coping forms linked with unhealthy self-criticism (e.g., rumination and worry; Armstrong & Rimes, 2016; Mowlaie et al., 2016). These studies have already shown that high SC is related to higher use of a variety of engagement and less disengagement coping strategies in demanding or painful situations (e.g., Sirois et al., 2014; Gillanders et al., 2015). In a review article on how more self-compassionate people have a tendency to cope more adaptively with demanding life events, Allen and Leary (2010) reported studies that only focused on associations between SC and very few coping strategies (cognitive reframing, active coping/problem solving, seeking support, avoidance, and distraction) due to a lack of studies over a decade ago. They also found quite inconsistent outcomes for the link between SC and some problem-focused strategies, e.g., active coping in particular. Therefore, the main goal of the meta-study was to investigate the relation between SC and coping in a systematic way by performing a meta-analysis. More specifically, it targeted to answer the following research question: How does SC relate to different forms of engagement (i.e., adaptive) and disengagement (i.e., maladaptive) coping by investigating the link at three different levels. To examine relations

with SC at the highest level, coping was divided into adaptive and maladaptive coping. At the next level, the focus was on the two adaptive coping styles (problem-focused vs. emotional approach coping). Finally, the relation between SC and individual coping strategies were investigated at the lowest level of aggregation. In particular, it was assumed that SC was positively associated with adaptive coping, also containing problem-focused and emotional approach coping strategies, and that SC and maladaptive coping were negatively related. The main hypothesis was preregistered at the international prospective register of systematic reviews PROSPERO (registration identifier: CRD42018104926) following the guidelines of the PRISMA group (Moher et al., 2009).

The systematic literature search resulted in $k = 136$ samples with an overall sample size of $N = 38,913$. To integrate the z-transformed Pearson correlation coefficients, random-effects models were calculated.

As expected, results showed that SC was positively associated with adaptive coping ($r = .31, p < .001, 95\%-CI = [.23; .36]$) and negatively with maladaptive coping ($r = -.50, p < .001, 95\%-CI = [-.55; -.47]$). Moreover, also the link between SC and emotional approach coping ($r = .34, p < .001, 95\%-CI = [.25; .42]$) as well as the one as between SC and problem-focused coping ($r = .21, p < .001, 95\%-CI = [.17; .29]$) turned out to be as assumed. Last but not least, associations on the strategy level mostly showed in the expected directions as well (e.g., positive reframing: $r = .40$; acceptance: $r = .31$, behavioral disengagement: $r = -.26$ and denial: $r = -.21$), though, especially, non-classical coping forms such as rumination and worry also seem to be highly related to SC. Taking potential moderators into account, mainly the age of participants seems to be a notable moderator of the association between SC and coping responses.

Thus, being more self-compassionate might be one factor for shedding more light on stress processing in terms of using healthier coping responses while dealing with stressful life events. The size and direction of correlations between SC and considered coping responses

turned out to be as assumed. Future studies should investigate the pathways between SC and coping in particular and also take into account additional influential factors.

4.2 Overview of Study 1 and Study 2: Longitudinal Studies

A theoretical framework was provided by the transactional model of stress (Lazarus and Folkman, 1984), which suggests that the etiology of stress processing unfolds via two distinct but interrelated pathways - stress appraisals and coping responses. Both mechanisms are argued to promote higher affective well-being (Lazarus & Folkman, 1984). In addition, research has already found evidence that a self-compassionate attitude is associated with less perceived stress as well as more engagement and less disengagement coping responses. In line with Lazarus' stress theory, research has also proposed that both - stress perception and coping responses - could be processes underlying the association between SC and affective well-being. However, a longitudinal analysis of the overall model was still missing. Thus, the primary goal of these two longitudinal studies was to investigate if SC might work as an additional factor as it facilitates a self-caring and balanced attitude towards oneself in challenging situations, and thus, might help to regulate emotions. Furthermore, limitations of past research such as specific, mainly clinical samples as well as cross-sectional designs were taken into account in two longitudinal studies. These can be described as much more appropriate than cross-sectional studies for examining mediation effects as well as leading to better indications of a causal direction (e.g., Cole & Maxwell, 2003; Selig & Preacher, 2009). Moreover, except for my preliminary study, past research only considered either perceived stress or coping responses as underlying factors between the relation between SC and affective well-being. According to Lazarus' stress theory, both processes should be controlled for their overlap as they could mediate the relation between SC and affective well-being simultaneously. Therefore, all three issues were targeted in this work. Derived from that, it was hypothesized that a more self-compassionate attitude is linked to less perceived stress and more use of salutary coping responses (more engagement and less disengagement coping). Furthermore, it was suggested that perceived stress and coping responses mediate the relation between SC and affective well-being. All hypotheses were preregistered online at the Open

Science Framework (see at:

https://osf.io/fhm9q/?view_only=577dd62d2f5548d59ccf703ee1d0d0a6).

For testing these assumptions, two short-term longitudinal online studies were designed with three measurement waves each. To access SC, perceived stress, coping responses as well as affective well-being, several self-report measures were implemented in all three waves. The first study examined a student sample ($N = 684$; $M = 27.91$ years, $SD = 9.98$; range = 18 – 81) over a six-weeks period. The second one (GESIS Panel; $N = 2,934$; $M = 52.76$ years, $SD = 13.07$; range = 23 – 74) investigated the assumptions in a population-based sample across eight weeks. Three-wave cross-lagged designs were used as they have been recommended when testing mediation hypotheses in particular (Cole & Maxwell, 2003). Thus, effects between SC at Time 1 as the independent variable; perceived stress, adaptive (i.e., engagement) coping, and maladaptive (i.e., disengagement) coping at Time 2 as mediator variables controlling for each other; and affective well-being at Time 3 as the criterion variable were examined.

Considering only the link between SC and stress processing variables in both studies, all cross-lagged paths between all relevant variables turned out to be significant, demonstrating a negative relation between SC at Time 1 and perceived stress (Study 1: $B = -0.22$, $p < .01$, $95\%-CI = [-0.36; -0.09]$, Study 2: $B = -1.29$, $p < .001$, $95\%-CI = [-1.88; -0.73]$) and disengagement coping (Study 1: $B = -0.01$, $p < .01$, $95\%-CI = [-0.02; -0.00]$) as well as a positive link with engagement coping response at Time 2 (Study 1: $B = 0.03$, $p < .001$, $95\%-CI = [0.02; 0.04]$, Study 2: $B = 0.43$, $p < .001$, $95\%-CI = [0.32; 0.55]$) with one exception in the population sample for the relation of SC at Time 1 and disengagement coping two months later ($B = -0.08$, $p = .154$, $95\%-CI = [-0.19; 0.03]$). Furthermore, cross-lagged-panel analyses indicated that perceived stress mediated the relation between SC and affective well-being in both longitudinal studies (Study 1: indirect path through perceived stress: $E = .002$, $p < .05$, $95\%-CI = [.00; .01]$, Study 2: indirect path

through perceived stress: $E = .03, p < .001, 95\%-CI = [.03; .06]$). In terms of mediational pathways through coping responses, only engagement coping responses showed in the expected direction in Study 2 ($E = .013, p < .010, 95\%-CI = [-.00; .03]$). Disengagement coping responses did not turn out as a mediator in both studies.

Thus, a more self-compassionate attitude can enable effective stress processing, whereby especially a healthier stress perception seems to be the most promising factor facilitating affective well-being. This work may give a more profound understanding of the underlying processes of the link between SC and affective well-being.

4.3 Overview of Study 3: Ambulatory Assessment Study

Although several studies have shown that SC is associated with healthier stress processing and promotes affective well-being (e.g., Dupasquier et al., 2020; Homan & Sirois, 2017; Sirois et al., 2014), most past studies have focused on associations of SC as a trait, meaning that a person with higher levels of SC usually deals with stressors in a healthier way and experiences higher affective well-being (Adams & Leary, 2007; Stutts et al., 2018). Early on, research promoted that inter-individual variability of behavior (within-person) always goes hand in hand with substantial intra-individual variability (between-persons) over occasions and contexts (e.g., Fleeson & Jayawickreme, 2015; Moskowitz et al., 1997). Thus, SC and its effects can also be considered at the within-person level (Zuroff et al., 2021). However, relations at the within-person level of SC as well as underlying mechanisms between momentary levels of SC and affective well-being in the everyday context have rarely been investigated and might differ from reported between-person effects. So far, very few studies have examined the salutary effects of SC at the within-person level focusing exclusively on health behaviors, i.e., eating and exercise behavior (Breines & Chen, 2013; Kelly & Stephen, 2016; Li et al., 2020). However, these results cannot be generalized beyond specific health behavior such as eating behavior. Referring to Lazarus' stress theory (1966), one can also assume that individual differences in momentary levels of SC could impact momentary levels in perceived stress and the use of coping responses, influencing affective well-being within this individual across different occasions. As influences of momentary SC on stress processing variables such as different coping or emotional responses have not been investigated yet, the last study of this PhD project should answer the question if the assumed relations of SC, stress processes and affective well-being can be transferred to the within-person level. More precisely, it was assumed that higher levels of momentary SC were linked to lower levels of stress as well as were associated with higher use of engagement coping and less use of disengagement coping. Moreover, higher levels of momentary SC were linked to

more positive affect and less negative affect at the intra-individual level. The last central aim of this study was to examine whether momentary levels of stress and coping responses mediated the link between momentary SC and affective well-being.

To test these assumptions, an ambulatory assessment approach was implemented to examine the dynamic relations between psychological sensations over different occasions. 213 participants completed measures of momentary SC, momentary perceived stress, engagement and disengagement coping responses, as well as affective well-being (i.e., positive and negative affect) via their smartphones three times per day over a one-week period. 1-1-1 multilevel mediation analyses were chosen for data analyses.

Multilevel modeling indicated that higher momentary levels of SC were related to less momentary levels of stress, more engagement and less disengagement coping at the intra-individual level (Estimates of the within-person random slopes were in the range from $B = -1.73$ to $B = 0.42$, all $p < .05$, 95%-CI did not contain zero). Additionally, multilevel mediation analyses revealed that momentary SC was linked to more positive and less negative affect, via perceived stress and healthier coping responses at the within-person level (indirect effect estimates ranged from $B = -0.17$ to $B = 0.24$, all $p < .05$, 95%-CI did not contain zero; with one exception for engagement coping in the link between SC and negative affect, $p = .08$). In an alternative model with momentary SC one occasion prior as the independent variable, the within-person relations of the original 1-1-1 multilevel mediation could mainly be replicated (Estimates of the with-person random slopes ranged from $B = -1.69$ to $B = 0.11$, all $p < .05$, 95%-CI did not contain zero), with one exception for momentary SC and disengagement coping in the model with negative affect as the dependent variable. However, considering the mediational pathways, the most promising mediator in the link between SC one occasion prior and affective well-being turned out to be perceived stress (positive affect: $B = .05$, $p < .05$, 95%-CI = [0.00; 0.11]; negative affect: $B = -0.04$, $p = .07$, 95%-CI = [-0.09; -0.00]).

Thus, this work helps to give further insight into the relations between SC, stress processing and affective well-being, as well as into the mediational pathways between momentary SC on affective well-being at the intra-individual level. Theoretical and practical implications of these findings are discussed in section 8 in further detail.

5 Meta-Study

Self-Compassion and Coping: A Meta-Analysis

Title:**Self-compassion and Coping: A Meta-Analysis.**

Christina Ewert*

University of Potsdam, Institute of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany. Tel.: 01515757459207, E-Mail: cewert@uni-potsdam.de.

Annika Vater

University of Potsdam, Institute of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany, E-Mail: annika.vater@gmail.com.

Michela Schröder-Abé

University of Potsdam, Institute of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany, E-Mail: michela.schroeder-abe@uni-potsdam.de.

*Corresponding Author

Abstract

Objectives

Self-compassion, a positive and caring attitude toward oneself, has been identified as an important correlate of coping in stressful situations. High self-compassion is related to higher use of adaptive and less maladaptive coping in demanding or painful situations. However, estimates of these relations in terms of specific adaptive and maladaptive coping strategies have remained inconclusive. Therefore, the present meta-analysis investigates the relation between self-compassion and different forms of adaptive and maladaptive coping. It also takes into account potential moderators such as age, gender, and regional background.

Methods

A systematic literature search resulted in $k = 136$ samples with an overall sample size of $N = 38913$. Random-effects models were used to integrate the z -transformed Pearson correlation coefficients.

Results

Analyses yielded a positive correlation between self-compassion and adaptive coping ($r = .306$) and a negative correlation between self-compassion and maladaptive coping ($r = -.500$). The association of self-compassion with emotional approach coping was positive ($r = .340$), as was the association with problem-focused coping ($r = .205$). Participants' age appeared to be a significant moderator of the relation between self-compassion and coping.

Conclusions

Self-compassion is important for understanding the mechanisms involved in coping with stress and demanding life events. The size and direction of correlations depend on the coping strategies considered, with protective effects of self-compassion with respect to maladaptive coping being the most pronounced. Further research should examine the relation between self-compassion and coping in more detail and focus on additional moderators.

Keywords: Self-compassion, stress, coping, multi-level analysis

Throughout our lives, we experience many acute and chronic stressors that influence us physiologically and psychologically. There are substantial individual differences in how people cope with these challenges (Larsen, 2000), which have been analyzed with respect to broad personality factors such as the Big Five (Carver & Connor-Smith, 2010; Connor-Smith & Flachsbart, 2007). More recently, Eastern personality concepts have been explored in this context, as well. One of these concepts is self-compassion, which can be described as a caring attitude towards oneself in potentially threatening situations (Neff, 2003b). There is a large body of research indicating associations between self-compassion, individuals' evaluations of potentially threatening situations, and the ways they then respond to these stressful situations. Moreover, meta-analytic evidence suggests that self-compassion is a protective factor in relation to psychopathology and to enhancing well-being in general (MacBeth & Gumley, 2012; Muris & Petrocchi, 2017; Zessin et al., 2015). In addition, it is well known that the way people cope with stress is crucial for their mental and physical health (Littleton et al., 2007). Research on the relation between self-compassion and coping mostly indicated positive associations of self-compassion with adaptive coping strategies and negative relations with maladaptive coping strategies (Costa & Pinto-Gouveia, 2013; Leary et al., 2007; Neff et al., 2005). However, so far there has been no quantitative integration of evidence on the association between self-compassion and coping.

Self-compassion has recently received increased attention, especially in the exploration of psychological functioning while living a stressful life. Neff (2003b, p.87) defined it as "being touched by and open to one's own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one's suffering, and to heal oneself with kindness." Self-compassion encompasses three interrelated elements (Neff, 2003a; Leary et al., 2007): self-kindness versus self-judgment, a sense of common humanity versus

isolation, and mindfulness versus over-identification. Self-kindness includes forgiveness, empathy, sensitivity, warmth, and patience toward all aspects of oneself in times of suffering, accompanied by complete acceptance of one's own fallibility and the desire to care for oneself in moments of grief and pain. A sense of common humanity brings with it feelings of social connectedness amid suffering and seeing failures and shortcomings as part of being human and as something that all people may experience in life. Mindfulness describes a balanced awareness of painful experiences between the two extremes of avoiding vs. over-identification. Mindfulness enables one to deeply experience one's own fallibilities without suffering from distracting worries and strong self-evaluations. All three facets of self-compassion are thought to interact and create a mindset that is characterized by an openness to one's feelings in demanding life situations with the intention to care for oneself instead of criticizing one's own mistakes or failures (Neff, 2016).

Confronted with stressful situations, individuals try to alleviate stress by reducing stressors, regulating negative emotions, and re-establishing their inner balance; that is, they engage in coping. The most commonly used definition of coping by Lazarus and Folkman (1984) described it as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p.141). Much of the research on coping originated from Lazarus' (1966) transactional model of stress and coping. According to the model, stress is a bidirectional process: Not only do appraisals influence coping efforts, but the effectiveness of coping efforts, in turn, impacts how individuals perceive a situation and their own ability to cope with the associated demands. In the stage of primary appraisal, individuals classify a situation as potentially threatening, challenging, or harmless. Simultaneously, individuals assess the resources that are required to minimize, tolerate, or eradicate the potential stressor and the stress it produces (secondary appraisal). If resources are evaluated as being insufficient, a stress reaction is triggered. Once this is the case, the coping process comes into

play. Coping attempts are assumed to affect further primary and secondary appraisals (i.e., reappraisal). Then, individuals re-evaluate whether new information has changed the interaction between their personal and environmental conditions. Since the definition of Lazarus and Folkman (1984), the construct of coping has been broadened and is now viewed as the regulation of a broader range of functions in reaction to stress (Compas et al., 2017).

Several taxonomies to classify coping strategies have been proposed (for an overview, see Compas et al., 2017; Compas et al., 2001). However, none of these systems of classification integrates all coping strategies or fully accounts for the complexity of coping (Carver & Connor-Smith, 2010; Compas et al., 2001; Skinner et al., 2003). In the present meta-analysis, a hierarchical model integrating two popular coping categorization approaches – namely (1) problem-focused vs. emotion-focused coping (Carver & Connor Smith, 2010; Connor-Smith & Flachsbart, 2007; Roth & Cohen, 1986) and (2) adaptive vs. maladaptive coping (e.g., Carver & Connor-Smith, 2010) – is used to structure and categorize the different coping strategies. The theoretical background for this coping structure is presented in detail below.

While problem-focused coping attempts to influence the source of stress, emotion-focused coping attempts to diminish associated negative emotions by means of different strategies (Carver et al., 1989). Problem-focused coping is used to influence the stressor itself by removing it or reducing its impact if the stressor itself cannot be removed. For example, a student expecting an exam in a few weeks could actively prepare for this by creating a To-Do list (planning), which could also help to prioritize studying before leisure activities (suppression of competing activities) and to schedule meetings with a fellow student to discuss problems with the learning material (instrumental social support). Problem-focused coping typically predicts higher psychological functioning and long-term mental health (Lazarus & Folkman, 1984). Emotion-focused coping aims at minimizing emotional distress that comes with a challenging or threatening situation. Emotion-focused coping includes a

wide range of strategies, such as self-soothing strategies (e.g., seeking emotional support), venting, avoiding stressful situations or focusing on negative thoughts (e.g., rumination or worry). Emotion-focused strategies are traditionally considered helpful in the short term but predict poorer outcomes in the long run. (Connor-Smith & Flachsbart, 2007; Lazarus & Folkman, 1984). One reason could be that they might help in regulating acute negative emotions but not in overcoming the problem itself, resulting in more stress in the end. For example, a student might feel better avoiding studying for an exam for the moment, but by doing this, they might not have enough time in the end and fail the exam, causing more negative consequences. Emotion-focused coping strategies can be further differentiated into emotional approach coping (e.g., cognitive reframing or acceptance) and emotional avoidance coping (e.g., denial or wishful thinking) (e.g., Schnider et al., 2007). Emotional avoidance coping is nearly always dysfunctional, as it does not affect a threat's possible impact in the long run. In contrast, emotional approach coping is more adaptive and can sometimes result in more positive psychological adjustment than problem-focused strategies, especially when the threat is uncontrollable (e.g., a terminal disease) or a demanding, unchangeable event that has already happened in the past (e.g., the death of a close friend) (Carver & Connor-Smith, 2010; Gillanders et al., 2015; Stanton et al. 2000).

Coping approaches, in general, have often been categorized into two dimensions for which an interchangeable nomenclature is used: While some authors distinguished between adaptive and maladaptive coping, others used the terms “engagement and disengagement coping” or “approach and avoidance coping”. However, these three two-dimensional distinctions are thought to be equivalent (Carver & Connor-Smith, 2010; Connor-Smith, Compas, et al., 2000; Connor-Smith & Flachsbart, 2007). For clarity of presentation, the present meta-analysis only refers to adaptive and maladaptive coping. Adaptive coping includes coping strategies aimed at actively dealing with the stressor or the associated emotions that are experienced in stressful situations. Adaptive coping thus contributes to more

sustainable long-term solutions to problems. Maladaptive coping encompasses strategies to escape the stressor or associated emotions and can be seen as dysfunctional in terms of long-term solutions (Connor-Smith et al., 2000; Connor-Smith & Flachsbart, 2007; Roth & Cohen, 1986; Skinner et al., 2003; Tobin et al., 1989). This adaptive-maladaptive distinction focuses on the orientation towards or away from the stressor and thus overlaps with the distinction between problem-focused and emotion-focused coping. Adaptive coping comprises all problem-focused strategies (e.g., active coping) and all emotional approach strategies (e.g., positive reframing). Maladaptive coping comprises emotional avoidance coping strategies (e.g., denial) aimed at escape from the distressing feeling. Rumination and worry were introduced later in the literature and had not been included in traditional categorizations (Carver et al., 1989). However, the two concepts have also been subcategorized as maladaptive coping in newer coping literature, as their long-term outcome is less protective in terms of psychological health (Carver & Connor-Smith, 2010).

Although the aforementioned ways of grouping coping strategies into broader categories are the two most commonly used, reviews have revealed more than 100 ways to describe the structure of coping (Carver & Connor-Smith, 2010; Connor-Smith & Flachsbart, 2007; Skinner et al., 2003). To model the coping construct, many of the common approaches employed a hierarchical structure to describe coping (Compas et al., 2017; Connor-Smith & Flachsbart, 2007; Skinner et al., 2003). Such a hierarchical model can be imagined as similar to a pyramid and is used to structure the present meta-analysis: At the top of the pyramid, adaptive and maladaptive coping are differentiated into broad coping dimensions (Compas et al., 2017; Connor-Smith & Flachsbart, 2007). On the next level, adaptive coping is further differentiated into problem-focused coping and emotional approach coping, whereas maladaptive coping entails emotional avoidance coping. The bottom level entails individual coping strategies. For a visualization of the taxonomy used in this work, see Figure 1.

[Insert Figure 1 about here.]

In recent years, self-compassion has gained immense interest in the field of stress processing. Conceptualizations of self-compassion describe it as an attitude helping individuals to maintain a balanced perspective in the face of failure. Thus, instead of avoiding painful feelings, individuals held them in awareness with a self-caring attitude and a sense of shared humanity (Costa & Pinto-Gouveia, 2013; Gilbert & Procter, 2006; Neff, 2003b). Finlay-Jones (2017) found that being more self-compassionate in daily life may influence the nature of stressors to which individuals are exposed (e.g., through protective self-care behaviors), the appraisals of stressors that individuals encounter, physiological and affective responses to stress, and the strategies that individuals deploy when attempting to cope with stress. According to the model of Lazarus (1966), stress appraisal processes are influenced by specific environmental and personal factors (Lazarus & Folkman, 1984). Thus, in line with Lazarus' (1966) stress theory, high levels of self-compassion can be seen as a personal resource that might help an individual to appraise stressful situations and personal weaknesses as less threatening when considering them in light of the shared human experience (Neff & Dahm, 2015). Moreover, self-compassion can be thought of as a useful skill that helps individuals to maintain a balanced perspective in the face of failure, and which transforms negative emotions of shame and self-condemnation into more productive emotions of compassion for one's imperfect humanity. Thus, self-compassionate individuals might not engage in harsh self-criticism or overidentify with their flaws; instead, they may have more resources left to reappraise a demanding situation, activate self-care behaviors, and handle stressors actively by relating to oneself with kindness. Therefore, it is reasonable to assume that self-compassion is associated with coping behavior in many ways (Neff et al. 2005).

It can be assumed that self-compassion is negatively related to maladaptive (emotional avoidance-oriented) coping. A self-compassionate attitude might help someone take a stressor as it is instead of avoiding painful feelings or ruminating on their own sufferings and failures. Furthermore, it facilitates forgiveness of one's own weaknesses due to less self-blaming,

which makes it less necessary to deny one's failures and shortcomings (Neff, 2003b). In addition, a self-compassionate orientation may foster emotional approach coping because self-compassion entails the ability to experience one's feelings with clarity and helps, therefore, to generate an accepting and balanced attitude towards one's own suffering, minimizing the tendency to construe negative experiences in a gloomy, self-destructive way (Chishima et al. 2018; Neff et al., 2005; Neff, 2003b). Indeed, studies have already shown that self-compassion is negatively related to maladaptive coping forms and positively related to adaptive coping forms, especially to emotional approach coping strategies (Costa & Pinto-Gouveia, 2013; Leary et al., 2007; Neff et al. 2005; Sirois, Molnar, & Hirsch, 2014).

Despite the growing body of literature linking self-compassion with more adaptive and less maladaptive coping, research has been inconclusive with respect to the link between self-compassion and some of the specific coping strategies. While several studies have shown consistent benefits of self-compassion in applying emotional approach coping strategies like positive reframing and acceptance (Adams & Leary, 2007; Costa & Pinto-Gouveia, 2013; Gilbert & Procter, 2006; Neff, Rude, & Kirkpatrick, 2007; Wong & Yeung, 2017), research on the relation between self-compassion and certain problem-focused strategies (including active coping, planning, suppression of competing activities, and restraint coping) has yielded mixed results (Chishima et al. 2018; Exline et al., 2016; Gillanders et al., 2015). In their theoretical review of how people who were high in self-compassion tended to cope with stressful events, Allen and Leary (2010) only focused on a few coping strategies (cognitive reframing, problem solving, seeking support, avoidance, and distraction) due to a lack of studies at that time. They also reported quite inconsistent results regarding the relation between self-compassion and some coping strategies, in particular for the relation between self-compassion and problem-focused strategies. Moreover, recent research has suggested that the relation between self-compassion and problem-focused strategies might be influenced by two factors, namely the controllability of stressful situations and how threatening the stressor

is perceived to be (Chishima et al. 2018). In addition, past studies often focused on dealing with a stressor that has already occurred and could not be changed, such as chronic illnesses or pain. Problem-focused strategies such as active coping, which involve efforts to remove or circumvent stressors, are of questionable utility in such circumstances (Brion et al. 2014; Costa & Pinto-Gouveia, 2013; Sirois et al., 2014). Lastly, being self-compassionate means that individuals do not engage in harsh self-condemnation or over-identification with their dysfunctional thoughts; rather, they experience the emotional safety needed to face situations without running away from them. In the last few years, research on self-compassion and coping has grown immensely, especially for coping strategies associated with unhealthy self-criticism (e.g., rumination, and worry), which have not been reviewed in a systematic way (Armstrong & Rimes, 2016; Mowlaie et al., 2016).

The present study aims to perform a meta-analysis on the relation between self-compassion and coping. Specifically, it aims to answer the following research questions: (1) How does self-compassion relate to different forms of coping? (2) Do selected moderators influence the relation between self-compassion and different forms of coping? The first research question was investigated at three different levels of detail: At the most aggregated level, we differentiated between adaptive and maladaptive coping to investigate relations with self-compassion. At the second level, we focused on the two adaptive coping styles (problem-focused and emotional approach coping). At the lowest level of aggregation, we examined the relation between self-compassion and individual coping strategies. We hypothesized that self-compassion is positively related to adaptive coping, including problem-focused and emotional approach coping strategies, and that self-compassion and maladaptive coping (emotional avoidance coping) are negatively related. Additionally, we hypothesized that the relation between self-compassion and emotional approach coping is stronger than the relation between self-compassion and problem-focused coping. The second research question explored the impact of potential moderators on the relation between self-compassion and different forms of

coping. Age, gender, and study region (as an indicator for cultural differences) have often been taken into account as potential moderators in psychological research (Connor-Smith & Flachsbart, 2007; Sirois et al., 2014). Since there is still little research on the moderators of the relation between self-compassion and coping, age, gender, and study region were thus exploratively analyzed in the present meta-analysis. The main hypotheses were pre-registered at the international prospective register of systematic reviews PROSPERO. The registration identifier is CRD42018104926.

Method

Literature Search

This meta-analysis included published and unpublished studies. The literature search was conducted in Pubmed, PubPsych, PsycARTICLES, Psychology & Behavioral Science Collection, PsycINFO, PSYINDEX, MedPilot, and Google Scholar on literature written in English or German until the second week of February 2019. To find relevant publications, the following keywords and operators were used: In separate searches, the terms “compassion” or “self-compassion” or “Self-Compassion-Scale” were combined with one of the three following groups of search terms using the AND operator: (1) broader coping constructs, i.e. “adaptive coping” or “maladaptive coping” or “approach coping” or “avoidance coping” or “engagement coping” or “disengagement coping” or “problem-focused coping” or “emotional coping”; (2) frequently used coping scales measuring a variety of coping strategies, i.e. “COPE” or “Ways of Coping Checklist” or “Coping Strategies Questionnaire” or “Coping Inventory for Stressful Situations” or “Coping Response Inventory” or “Chronic Pain Coping Inventory; (3) individual coping strategies, i.e. “active coping” or “planning” or “suppression of competing activities” or “restraint coping” or “instrumental social support” or “emotional social support” or “reframing” or “positive reinterpretation” or “acceptance” or “turning to religion” or “spirituality” or “problem solving” or “humor” or “humour” or “denial” or “behavioral disengagement” or “mental disengagement” or “self-distraction” or “venting (of

and focus on negative emotions)” or “drug disengagement” or “alcohol disengagement” or “drug abuse” or “alcohol abuse” or “expressive suppression” or “experiential avoidance” or “self-blame” or “rumination” or “wishful thinking” or “worry.” In addition, the reference sections of all published studies were scanned for additional published or unpublished studies.

To deal with possible influences due to publication bias, the following methods were used. First, authors of published articles were asked for missing data and for further unpublished material (e.g., theses, book chapters, posters, etc.). Second, Kristin Neff’s homepage (www.self-compassion.org), which gives an overview of works in this field of research, was checked for more information (e.g., papers, dissertations, unpublished material, etc.). Third, the mailing list systems of the German Psychological Society, the Association for Research in Personality, and the European Association of Personality Psychology were used to ask researchers in the field for unpublished material. Using these three approaches, nine additional publications were found for further examination.

Selection of the Studies

We followed the guidelines of the PRISMA group (Moher et al., 2009) and used a PRISMA flow chart for visualization (see Figure 2). The initial search produced 869 records after removing duplicates. In the next step, 592 studies were excluded based on the following criteria: (1) no measure of coping, (2) no measure of self-compassion, (3) review articles, (4) no empirical study. 277 studies met the inclusion criteria for the first step, which were as follows: (1) measure of coping – at least one standardized measure of a single coping strategy had to be collected in a single study (see Appendix A in the supplementary materials); (2) measure of self-compassion (Self-Compassion Scale; Neff, 2003a), its short form (Raes et al., 2011), or translations of these scales, and (3) participants aged ≥ 17 . Next, an in-depth eligibility check was performed to include only studies (4) reporting baseline correlations of self-compassion and our target variables mentioned above. For studies not reporting correlation coefficients or showing other missing data, researchers were contacted (a

maximum of three times). After the first inclusion of the 272 initially included full-text articles with 277 suitable studies, 130 studies with 136 samples remained for the quantitative analysis. The rest were excluded because of the following reasons: no quantitative data analysis was performed, studies seemed relevant, but the complete paper was not available or not written in English or German, or correlation coefficients were not reported in the papers and could not be obtained via e-mail request. For all studies, if data were reported separately for different subsamples, data were entered accordingly and then aggregated. Thus, for each analysis, only one effect size per study was used. Supplementary materials for meta-analysis is provided at <https://osf.io/27d43/>

[Insert Figure 2 about here.]

Coding of Study Characteristics, Measurements, and Correlations

In the first step, the following study characteristics were coded. Names of authors and year of publication were reported in the beginning. Afterwards, several sample characteristics were coded, such as sample size, the sample's mean age and standard deviation, gender (percentage of female participants per study), and region (Western and Eastern). In a second step, measurement characteristics were coded. Coping was classified in three different ways. First, all coping strategies were categorized into the two broader subgroups of overall adaptive coping and overall maladaptive coping. Second, adaptive coping strategies were coded into the subcategories of problem-focused coping and emotional approach coping. Third, each individual coping strategy was coded. Finally, the Pearson correlation (r) coefficients between self-compassion and the different categorizations of coping were coded. For the few studies that measured the underlying constructs in the opposite direction (e.g., psychological flexibility instead of experiential avoidance), it was necessary that the theoretically incongruent effect sizes were multiplied by -1 for further analyses. Coding was performed by the first author and afterwards independently by the second author for thirty percent of the studies in order to analyze intra-coder and inter-coder reliability to evaluate the coding

process. Inter-coder agreement (two coders used the same code on one occasion) and intra-coder agreement (a single coder did two rounds of coding on the same studies) were calculated (Cohen's Kappa). For all variables, the intra-coder and inter-coder agreement rates were higher than $\kappa = .95$, except for the intra-coder agreement rate of coping ($\kappa = .904$). Every study characteristic was initially coded by the first author and afterwards independently by the second author. Differences between coders were solved via discussion.

Data Analyses

In the case of multiple effect sizes for the same coping strategy (e.g., if results for several measures were reported), effect sizes were first aggregated into one effect size using a random-effect assumption. For analyses on higher-order categories (e.g., adaptive/maladaptive or problem-focused/emotional approach coping), we then additionally aggregated all coping strategies allocated in the respective category. Thus, each analysis only included one effect size per sample (Schmidt & Hunter, 2014). For aggregation, all Pearson correlation coefficients of each sample were weighted by their corresponding sample size, and the inverse-weighted means were transformed into Fisher's Z (Hedges & Olkin, 1985).

First, two primary meta-analyses were conducted to compute the main effects on all studies reporting associations between self-compassion and overall adaptive coping, as well as between self-compassion and overall maladaptive coping. Second, meta-analyses were carried out for problem-focused and emotional approach coping. Due to the structure of coping that was adopted in the present study, overall maladaptive coping and emotional avoidance coping were treated as equivalent, and thus only results for overall maladaptive coping are reported. Third, separate meta-analyses were conducted for each individual coping strategy if at least three studies were available. We used random-effects models because of the expected and statistically confirmed heterogeneity between studies. Furthermore, random-effects models consider the variability in study effect sizes due to the population variability in effect sizes (Card, 2012), which allows for generalization of the results beyond the set of

studies analyzed in the meta-analysis (Hedges & Vevea, 1998). Raw effect sizes, given as Pearson's r , were transformed to Fisher's z scale prior to meta-analytic syntheses for variance stabilization (Borenstein, 2011). After completion of the analyses, they were converted back to Pearson's r for interpretive purposes. We used the Wald Test (Wald, 1943) to test the statistical significance of the model coefficients. Additionally, 95% confidence intervals were reported.

In the case of significant between-study heterogeneity, indicated by a significant Q statistic, moderator analyses were performed to identify sources of heterogeneity. The effects of moderator variables on effect sizes were analyzed with random-effect meta-regression analyses for all variables: the proportion of women, mean age of participants, geographic region of the sample, and coping style. For that, the two dichotomous variables were dummy-coded prior to analysis: geographical region of the sample (Western = 0, Eastern = 1) and coping style (problem-focused coping = 0, emotion-focused coping = 1). Meta-regression models using all studies that allow the amount of residual heterogeneity to be different in each subgroup were performed (Rubio-Aparicio et al., 2020). To detect meaningful differences, moderator analyses separately for all broader coping categories and for individual coping strategies when at least ten studies were available (Borenstein et al., 2011). Weighted mean effect sizes, study heterogeneity, sensitivity analyses, and subsequent moderator analyses were calculated (Quintana, 2015). In the sensitivity analysis, we first used the Baujat plot (Baujat et al., 2002) to detect outliers visually. The impact of any outliers was also addressed by the influence function (for further explanation, see Baujat et al., 2002; Viechtbauer & Cheung, 2010). Potential publication bias of the meta-analysis was evaluated in two ways: (1) inspection of funnel plots (i.e., a scatter plot of the effect sizes relative to their corresponding sample size, Light & Pillemer, 1984; Sterne & Egger, 2001) and, if publication bias was indicated, (2) via rank correlation test (Begg & Mazumdar, 1994) and Egger's regression test (Egger et al., 1997), the latter being more suitable for smaller meta-analyses. Publication bias

and sensitivity analyses were performed in all analyses that included at least ten samples. With fewer studies, the statistical test power is too low to be able to distinguish chance from real asymmetry (Higgins & Green, 2011). If publication bias was indicated, the trim and fill method was applied, giving a plausible approximation of “missing effect sizes” (Duval & Tweedie, 2000).

Results

Descriptive Information

In total, the meta-analysis included effect sizes from 130 studies with 136 samples. Except for one study (Neff et al., 2005), all studies included in the meta-analysis had been published since 2009. Most samples were recruited in Western countries ($k = 126$); only ten came from Eastern countries (e.g., Japan, Iran). In total, the meta-analysis comprised 38913 participants with a mean age weighted by the sample size of 30.16 years ($SD = 14.21$). The proportion of female participants was on average 66 percent ($SD = 14.63$).

Association between Self-compassion and Coping

Table 1 gives an overview of the results of the meta-analyses for the broader categories and all individual coping strategies. Self-compassion and overall coping forms were significantly related: The correlation between self-compassion and overall adaptive coping was $r = .306, p < .001$. The association between self-compassion and overall maladaptive coping was $r = -.500, p < .001$. When examining the relation between self-compassion and adaptive coping in more detail, we found a stronger association for emotional approach coping ($r = .340, p < .001$) than for problem-focused coping ($r = .205, p < .01$). To test whether the relation between self-compassion and emotional approach coping was significantly stronger than the relation between self-compassion and problem-focused coping, a moderation analysis was performed. As expected, meta-regression showed a significant moderation effect ($QM = 4.473, p < 0.05, z = 2.115$).

Self-compassion and the individual problem-focused coping strategies (active coping, planning, instrumental support, religious coping) were significantly positively related (ranging from $r = .141$ to $r = .250$, $ps < .05$). Considering emotional approach coping strategies (emotional support, acceptance, positive reframing, humor), all of them except humor showed a significantly positive association with self-compassion (ranging from $r = .141$ to $r = .396$, $ps < .05$). Furthermore, the emotional avoidance coping strategies of behavioral disengagement, denial, experiential avoidance, rumination, worry, self-blame, and substance use were significantly negatively associated with self-compassion, with correlations ranging from $r = -.117$ to $r = -.606$ ($ps < .001$), while expressive suppression, venting, and distraction did not show a significant connection to self-compassion. The relations between self-compassion and three individual coping strategies (restraint coping, suppression of competing activities, and wishful thinking) could not be calculated due to a lack of studies. For visualization, forest plots are also reported in Appendix B (supplementary materials).

[Insert Table 1 about here.]

Heterogeneity of Studies

In all analyses including at least three studies, except for substance use ($Q = 9.820$, $p = .278$), heterogeneity was found as indicated by the Q statistic: The effect size estimates were highly heterogeneous for both overall adaptive coping ($Q = 564.697$, $p < .001$) and overall maladaptive coping ($Q = 1762.078$, $p < .001$). Approximately 95 % of the variance in effect sizes for overall adaptive coping and 93 % of the variance in effect sizes for overall maladaptive coping can be attributed to between-study variance. For problem-focused coping ($Q = 259.046$, $p < .001$) and emotional approach coping ($Q = 308.941$, $p < .001$), the effect size estimates were also significantly heterogeneous. Except for substance use, the effect size estimates for all individual coping strategies were highly heterogeneous. For detailed information on study heterogeneity of the individual coping strategies, see Table 1.

Detection of Influential Cases and Outliers

Outlier and influential case diagnostics were performed whenever heterogeneity was present. For overall adaptive coping, for problem-focused coping, and for emotional approach coping, Huysmans and Clement (2017) contributed the most to heterogeneity, which was additionally found to be influential for the overall results (see influence functions in Appendix B, Figures S 3, S6, S9). Thus, meta-analyses were carried out a second time after removing this study. Re-analyses revealed a similar overall effect size ($r = .309, p < .001$) as the original analysis ($r = .306, p < .001$), and were also statistically significant. The same applied to the relations between self-compassion and the two subcategories problem-focused coping ($r = .224, p < .001$, original: $r = .205, p < .001$) as well as emotional approach coping ($r = .359, p < .001$, original: $r = .340, p < .001$). As sensitivity analysis suggested that this single effect size had almost no effect on the whole meta-analysis, was retained for the remainder of the analyses. Considering the relation between self-compassion and maladaptive coping, visual inspection of the Baujat Plot identified the study by Brooks et al. (2012) as an outlier. However, the study did not influence the overall effect size in a relevant way, indicated by nonsignificant influence diagnostics.

Outlier and influence diagnostics were also performed on the analyses of single coping strategies if they contained at least ten studies. Outlying and influential studies were only found for the relations between self-compassion and religious coping (Birnie et al. 2010; Rouse, 2012, Study 1). As for adaptive coping, the sensitivity analysis suggested only a modest effect on the effect size, and therefore the studies that represented outliers were retained for the rest of the analyses (for more information, see Supplementary Materials, Appendix B, Table S 2).

Publication Bias

For overall adaptive coping, no indications of publication bias could be found: Visual inspection of the funnel plot revealed a more or less equally dispersed distribution of study effect sizes on both sides of the overall mean effect size. Egger's regression test revealed no

evidence of publication bias ($z = 0.789, p = .430$), nor did the Rank correlation test ($\tau = 0.062, p = .566$). For overall maladaptive coping, a visual inspection of the funnel plot suggested an asymmetrical distribution (see Appendix B, Figure S 24). However, neither Egger's regression test ($\tau = -0.486, p = .627$) nor the Rank correlation test ($z = 0.036, p = 0.588$) were significant. The correlation effect size found by the trim and fill method ($r = -.498, p < .001$) did not differ much from the original one ($r = -.500, p < .001$) and was still highly significant. For the funnel plot giving a plausible approximation of "missing effect sizes", see Appendix B, Figure S 25.

Furthermore, initial visual inspection and analyses revealed no potential bias for the relation between self-compassion and either of the two coping styles (problem-focused and emotional approach coping), nor the individual coping strategies, except for the association with acceptance. For this association, Egger's regression test did show a significant result ($z = 1.984, p < .05$), indicating asymmetry in the funnel plot and, therefore, some evidence for publication bias in this relation. Funnel plots, fail-safe-N analyses, and if publication bias was indicated, Duval and Tweedie's (2000) trim and fill analyses are reported in the supplemental materials (see Appendix B).

Moderator Analyses on Demographic Variables

The study characteristics of mean age, proportion of females, and geographic region (Eastern and Western) were examined in moderator analyses to assess their potential impact on the relations between self-compassion and coping strategies when there were at least ten studies available.

The moderator analyses showed a significant effect of mean age for the relation between self-compassion and overall adaptive coping ($QM = 19.263, p < .001$), but not for the one between self-compassion and overall maladaptive coping ($QM = 0.052, p = .820$). Thus, higher age was connected to a stronger relation between self-compassion and adaptive coping. The mean age of the participants also moderated the association between self-compassion and

problem-focused coping ($QM = 11.945, p < .001$). In samples with higher age, the association between self-compassion and problem-focused coping was stronger. Additionally, the moderation analysis revealed a significant effect of mean age for the association between self-compassion and emotional approach coping ($QM = 9.719, p < .01$). When investigating individual coping strategies, mean age turned out to be a significant moderator for the relation between the problem-focused strategy of religious coping and self-compassion ($QM = 5.404, p < .05$), as well as between the emotional approach coping strategy positive reframing and self-compassion ($QM = 4.580, p < .01$), demonstrating that the association between self-compassion and these strategies are stronger among older individuals.

With one exception, no significant effects could be found for the other two moderators (i.e., percentage of females and geographical region) for the relation between self-compassion and all three levels of coping. The exception was a significant effect of gender moderating the association of self-compassion and religious coping ($QM = 7.541, p < .01$). In sum, we found little evidence for moderating effects of gender or geographical region influencing the connection between self-compassion and coping.

Results of the analyses of the potential moderators in the association between self-compassion and coping are presented in Table 2 and in Appendix C (supplementary materials) on the association between self-compassion and individual coping strategies.

[Insert Table 2 about here.]

Discussion

The Relation between Self-compassion and Coping

This meta-analysis aimed to investigate the relation between self-compassion and different forms of coping. For that, coping was considered on three different levels, which were all significantly related to self-compassion. As expected, at the broadest level, self-compassion was strongly positively associated with overall adaptive coping. Therefore, self-compassion

indeed seems to be a personal resource that provides a framework to handle demanding situations by relating to oneself with kindness, putting one's own difficulties into a larger human perspective, and encountering challenging emotions with balanced awareness. Thus, self-compassionate individuals might not engage in harsh self-criticism or over-identify with their flaws; instead, they may have more resources left to activate self-care behaviors and handle stressors and, subsequently, emotions (Neff et al., 2005; Folkman & Lazarus; 1990). In contrast, self-compassion has demonstrated negative associations with maladaptive coping. Therefore, self-compassionate individuals appear to engage less in strategies that are dysfunctional for well-being in the long run, such as trying to act as if the stressor were not real and blaming themselves for causing the distressing situation.

Considering the two subordinated adaptive coping styles, self-compassion was positively related to both emotional approach coping and problem-focused coping, although the latter connection was somewhat weaker. Also, Neff (2003b) and colleagues (Diedrich et al., 2014) described a self-compassionate attitude rather as emotion-focused and as helpful in regulating negative emotions, in which pain and distressing feelings are not avoided but perceived with awareness, kindness, and a sense of common humanity. Thus, distressing feelings might be converted into more positive states. Nevertheless, the adaptive responses of self-compassionate individuals to stressful situations also seems to be composed of strategies aiming to regulate the source of the stressor (problem-focused strategies), indicating that a self-compassionate attitude facilitates dealing with demanding situations actively to overcome them and their impending negative emotions.

The pattern of results regarding individual coping strategies was similar to the findings on broader levels of coping. Except for humor, all adaptive coping strategies included in the analyses (i.e., active coping, planning, religious coping, instrumental support coping, emotional support coping, acceptance, and positive reframing) were significantly positively related to self-compassion. Mirroring the results of the broader coping styles mentioned

above, positive reframing and acceptance (i.e., two emotional approach coping strategies) showed the highest associations with self-compassion. Therefore, the results suggested that self-compassionate individuals deal with stressful situations in a sustainable manner, especially through the reconstruction of a stressful situation in positive terms and acceptance of the current situation. All maladaptive coping strategies (behavioral disengagement, denial, experiential avoidance, expressive suppression, rumination, self-blame, worry, venting, distraction, substance use) were negatively correlated with self-compassion; however, correlations with expressive suppression, experiential avoidance, venting, and distraction were not significant. The strongest negative correlations with self-compassion were observed for the maladaptive coping strategies of self-blame, rumination, and worry. This indicates that a self-compassionate attitude particularly helps individuals to not engage in harsh self-condemnation or over-identification with their dysfunctional thoughts. All correlations can be seen as small to medium effect sizes, except for rumination, experiential avoidance, and worry with a large effect size estimate (Cohen, 1988).

The findings of the present meta-analysis largely matched those of the review by Allen and Leary (2010); however, there were also some results that contradicted the findings presented in Allen and Leary's review. For example, the relation between social support and coping was significant in our meta-analysis, but seemed not relevant in the review. These contradictory results may be due to the fact that our meta-analysis included more studies with an Eastern cultural background. In particular, newer studies with this background (Jeon et al., 2016) that were not included in the preceding review revealed a significant and positive association. In contrast, older studies conducted exclusively in Western countries yielded mainly small and nonsignificant correlations. This indicates that cultural differences may play a role in this relation as well. However, since the association was rather small, the moderation analysis did not reach significance, and we could only include very few studies, further research is needed to clarify this. In addition, the present meta-analysis included

questionnaires not only on seeking social support but also on receiving more social support from other people. As argued by Allen and Leary (2010), self-compassionate individuals may gain indirect social support, particularly from the knowledge that other people experience similar situations but do not necessarily seek support from others in stressful situations more frequently. Future research should, therefore, investigate the relation between self-compassion and different forms of social support coping.

This meta-analysis also investigated the influence of three different demographic moderators (age, gender, and region) on the relation between self-compassion and coping. With one exception, no significant moderation was found for gender and region. However, the age of the participants turned out to be a moderator of the relation between self-compassion and adaptive coping, problem-focused coping, and emotional approach coping, as well as several individual strategies (religious coping and positive reframing). These results indicated that the relation between self-compassion and coping was stronger among older people. This dovetails with findings from the meta-analysis of Zessin et al. (2015), in which age marginally influenced the association between self-compassion and psychological well-being. It is not clear why the protective effects of self-compassion were stronger in older individuals; thus future research may focus on the processes underlying this effect.

Limitations and Implications for Further Research

Some limitations should be mentioned in the following. A general problem with meta-analyses is a methodological one regarding unpublished data that could not be included in this meta-analysis. Moreover, over 50 studies would have been included via inclusion criteria except that relevant data for analysis were missing and could not be obtained by contacting the responsible researchers. Although publication bias was demonstrated for the association between self-compassion and maladaptive coping, even after correction for the bias with the trim and fill method, the resulting effect still showed a significant, negative association comparable to the original one. Therefore, it might be assumed that publication bias does not

influence the overall result very much. Additionally, with very few exceptions, no publication bias was found, indicating that the level of overall findings would probably not change if more unpublished studies were available.

Second, for some coping strategies such as venting or distraction, only very few studies were available. Therefore, results regarding these individual strategies should be interpreted with caution. Still, we decided to include all strategies in the main analyses, not only to give a better insight into the link between self-compassion and coping, but also to provide a more complete overview of existing research and identify gaps in the literature. Results showed that it might be interesting to conduct more empirical studies, especially on problem-focused coping. We had originally planned to include other, mainly problem-focused, coping strategies (e.g., restrained coping or suppression of competitive activities), but this was not possible due to a lack of research on their connection with self-compassion. Thus, future research should focus on this rather understudied aspect.

Third, coping as a construct is very complex. As mentioned earlier, there is no structure of coping that is generally accepted or applicable. Consequently, coping terms including several individual coping strategies that have been examined in research are not always equivalent, which can impede comparability among these studies. This meta-analysis mainly focused on the two common classifications of coping strategies. However, other strategies that are not usually included in these classifications might also play an important role in coping with stress. For example, proactive coping and hope both have a problem-focused nature, allowing one to scan stressful episodes more easily before they arise and, if necessary, follow a different path to achieve the desired goals and a happier life. Still, we excluded these strategies in the present analysis in order to focus on popular and well-founded coping terms. However, these restrictions show that results have to be generalized carefully and it is recommended to always note the specific strategies included when regarding broader coping terms.

It should be mentioned that Neff's Self-Compassion Scale has been criticized in recent years. Several studies re-examining the factor structure of the SCS have been conducted in the context of validating translations of the scale (Mantzios et al., 2015; Petrocchi et al., 2014). The large majority of translations replicated the six-factor structure of the scale, but not all examined the second higher-order model; and those that did yielded inconsistent findings (Hupfeld & Ruffieux, 2011; Petrocchi et al., 2014). However, a summary of new empirical evidence was provided using a bi-factor analysis by Neff and colleagues (2019), which indicates that at least 90 % of the reliable variance in SCS scores can be explained by an overall self-compassion factor. The results justify the use of a total scale score, which was used in the present meta-analysis as well. Nevertheless, support for a six-factor structure of the SCS was also found. Research suggests that the exploration of positive and negative indicators of self-compassion could be helpful in identifying the "relevant" components of self-compassion (Muris & Petrocchi, 2017; van Dam et al., 2011). Thus, more research focusing on the subscale level of self-compassion is clearly indicated. However, due to a lack of empirical studies on the subscale level of self-compassion, it was not possible to analyze the relation between the elements of self-compassion and coping in the present meta-analysis.

Furthermore, significant between-study heterogeneity was found for the relation between self-compassion and almost all coping forms in the present meta-analysis. The next step is to identify sources of heterogeneity. Study characteristics such as gender and age can be potential sources of heterogeneity (Bortz & Döring, 2006), and moderator analyses were conducted to assess their impact on effect sizes, albeit with few significant findings. Therefore, it might be worthwhile to investigate further moderators once a larger number of studies is available. Future studies should investigate further moderators, such as the type of stressor (e.g., whether the relation between self-compassion and problem-focused strategies is stronger in controllable situations) and subpopulations (e.g., whether the relation between self-compassion and maladaptive coping is stronger in clinical or non-clinical populations).

Another limitation is that most of the included studies were conducted in North America and Europe, which creates a more Western perspective on the relation between self-compassion and coping. More studies from Eastern parts of the world are needed to investigate potential cultural differences. Due to differences in stress regulation, the relation between self-compassion and coping might differ between cultures (Oyserman et al., 2002).

Being a quantitative cross-sectional meta-analysis, the present study is not able to make a statement concerning the causality behind the correlations of self-compassion and coping. On the one hand, higher levels of self-compassion might favor adaptive coping and buffer against maladaptive coping. On the other hand, adaptive coping strategies (e.g., positive reframing or active coping) might help to increase self-compassion. In the current analysis, baseline correlations were used to ensure the comparability of the correlations extracted from different study designs (i.e., longitudinal vs. cross-sectional ones).

Accordingly, variation and stability of the associations over time were not accounted for in this study. There has been research on a broad diversity of self-compassion trainings in the long term and experimental manipulations in the short term (e.g., Finlay-Jones, 2017; Germer & Neff, 2013; Smeets et al., 2014). However, there has been only a few studies using such experimental designs to investigate the causal relation between self-compassion and coping, focusing on the strategy of rumination (Johnson & O'Brien, 2013; Odou & Brinker, 2013, 2014).

Building on the results of our meta-analysis, future studies may want to expand the research question and analyze links between concepts that are closely related to self-compassion (e.g., compassion) and coping (e.g., coping flexibility). Compassion can be described as “being touched by the suffering of others, opening one’s awareness to others’ pain and not avoiding or disconnecting from it, so that feelings of kindness toward others and the desire to alleviate their suffering emerge” (Neff, 2003b, p. 86-87). Given that self-compassion and compassion are overlapping but not identical constructs (Mills, 2018), it

might be interesting to meta-analyze the compassion-coping link as well. Moreover, there is theory and empirical evidence stressing the benefits of coping flexibility (i.e., the ability to shift between different coping strategies to find the most effective response) as an adaptive response to stress (Kato, 2012). The latest research has already shown the protective impact of mindfulness on situational coping variability in daily life (Keng et al., 2018). Thus, it might also be interesting to examine how self-compassion relates to coping flexibility. Given the overlap between mindfulness and self-compassion, it may be hypothesized that self-compassion is associated with more flexible situational coping, as well as an overall profile of more adaptive dispositional coping. Therefore, examining how self-compassion relates to coping flexibility might be beneficial for further understanding of how self-compassion exerts its positive relation with coping. Further research is thus needed to investigate the direction of causality and processes underlying the link between self-compassion and coping.

Summing up, this meta-analysis helps us to gain a deeper understanding of the relation between self-compassion and coping and stimulates new research questions. It was established that self-compassion was related to higher levels of adaptive coping and lower levels of maladaptive coping in general. Older age strengthened the relations between self-compassion and adaptive coping forms. Moreover, the differences between problem-focused and emotional approach coping strategies in the present analysis also emphasize the diversity within the broad construct of coping and support the usefulness of our approach of distinguishing between these different forms in our analyses. As self-compassion appears to exert positive effects on coping with difficult situations, questions regarding potential ways of influencing self-compassion arise. More research on the reasons for individual differences in self-compassion as well as on the different interventions focusing on self-compassion can provide further knowledge on how self-compassion might be influenced in order to influence coping. Additionally, future studies should investigate the impact of potential moderators, such as controllability of a stressor or coping flexibility, on both the broad self-compassion

level and the subscale level, as well as causal mechanisms in the relation between self-compassion and coping.

Acknowledgments:

The authors would like to thank all authors providing their data for this meta-analysis.

Author Contributions:

CE: designed the meta-analysis, did the literature search, provided the data analyses and wrote the paper; AV: collaborated with the design and writing of the study, assisted with the literature search and data analyses; MSA: assisted to design the study, collaborated in the writing of the manuscript. All authors approved the final version of the manuscript for submission.

Funding Information:

This study was funded by a scholarship from the Potsdam Graduate School to the first author.

Compliance with Ethical Standards

Conflict of Interest:

The authors declare that they have no conflict of interest.

Ethical Approval:

This article (meta-analysis) does not contain any studies with human participants performed by any of the authors.

Informed consent:

No additional informed consent was obtained from all individual participants.

References

References to and relevant data from the studies included in the meta-analysis are given in Appendix D (see supplementary materials).

- Adams, C. E., & Leary, M. R. (2007). Promoting self-compassion toward eating among restrictive and guilty eaters. *Journal of Social and Clinical Psychology, 10*(10), 1120–1144. <https://doi.org/10.1521/jscp.2007.26.10.1120>.
- Allen, A. B., & Leary, M. R. (2010). Self-Compassion, stress, and coping. *Social and Personality Psychology Compass, 4*(2), 107–118. <https://doi.org/10.1111/j.1751-9004.2009.00246.x>.
- Armstrong, L., & Rimes, K. A. (2016). Mindfulness-Based Cognitive Therapy for neuroticism (stress vulnerability): A pilot randomized study. *Behavior Therapy, 47*(3), 287–298. <https://doi.org/10.1016/j.beth.2015.12.005>.
- Baujat, B., Mahé, C., Pignon J.-P., & Hill C. (2002). A graphical method for exploring heterogeneity in meta-analyses: Application to a meta-analysis of 65 trials. *Statistics in Medicine, 21*(18), 2641–2652. <https://doi.org/10.1002/sim.1221>.
- Begg, C. B., & Mazumdar, M. (1994). Operating characteristics of a rank correlation test for publication bias. *Biometrics, 50*, 1088–1101. <https://doi.org/10.2307/2533446>.
- Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health, 26*, 359–371. <https://doi.org/10.1002/smi.1305>.
- Borenstein, M. (2009). *Introduction to meta-analysis*. John Wiley & Sons.
<https://onlinelibrary.wiley.com/doi/book/10.1002/9780470743386>
- Brion, J. M., Leary, M. R., & Drabkin, A. S. (2014). Self-compassion and reactions to serious illness: The case of HIV. *Journal of Health Psychology, 19*(2), 218–229.
<https://doi.org/10.1177/1359105312467391>.

- Brooks, M., Kay-Lambkin, F., Bowman, J., & Childs, S. (2012). Self-Compassion amongst clients with problematic alcohol use. *Mindfulness, 3*, 308–317.
<https://doi.org/10.1007/s12671-012-0106-5>
- Cartwright, T., Edean, N., & Porter, A. (2009). Illness perceptions, coping and quality of life in patients with alopecia. *The British Journal of Dermatology, 160*(5), 1034–1039.
<https://doi.org/10.1111/j.1365-2133.2008.09014.x>
- Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61*(1), 679–704. <https://doi.org/10.1146/annurev.psych.093008.100352>.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267–283.
- Chishima, Y., Mizuno, M., Sugawara, D., & Miyagawa, Y. (2018). The influence of self-compassion on cognitive appraisals and coping with stressful events. *Mindfulness, 9*(6), 1907–1915. <https://doi.org/10.1007/s12671-018-0933-0>.
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin, 127*(1), 87–127.
<https://doi.org/10.1037//0033-2909.127.1.87>.
- Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin, 143*(9), 939–991. <https://doi.org/10.1037/bul0000110>.
- Connor-Smith, J. K., Compas, B. E., Wadsworth, M. E., Thomsen, A. H., & Saltzman, H. (2000). Responses to stress in adolescence: Measurement of coping and involuntary stress responses. *Journal of Consulting and Clinical Psychology, 68*(6), 976–992.
<https://doi.org/10.1037//0022-006X.68.6.976>.

- Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology, 93*(6), 1080–1107. <https://doi.org/10.1037/0022-3514.93.6.1080>.
- Costa, J., & Pinto-Gouveia, J. (2013). Experiential avoidance and self-compassion in chronic pain. *Journal of Applied Social Psychology, 43*(8), 1578–1591. <https://doi.org/10.1111/jasp.12107>.
- Diedrich, A., Grant, M., Hofmann, S. G., Hiller, W., & Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behaviour Research and Therapy, 58*, 43–51. <https://doi.org/10.1016/j.brat.2014.05.006>.
- Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics, 56*, 455–463. <https://doi.org/10.1111/j.0006-341X.2000.00455.x>.
- Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ, 315*(7109), 629–634. <https://doi.org/10.1136/bmj.315.7109.629>.
- Exline, J. J., Homolka, S. J., & Harriott, V. A. (2016). Divine struggles: Links with body image concerns, bingeing, and compensatory behaviours around eating. *Mental Health, Religion & Culture, 19*(1), 8–22. <https://doi.org/10.1080/13674676.2015.1087977>.
- Finlay-Jones, A. L. (2017). The relevance of self-compassion as an intervention target in mood and anxiety disorders: A narrative review based on an emotion regulation framework. *Clinical Psychologist, 21*(2), 90–103. <https://doi.org/10.1111/cp.12131>.
- Germer, C. K., & Neff, K. D. (2013). Self-compassion in clinical practice. *Journal of Clinical Psychology, 69*(8), 856–867. <https://doi.org/10.1002/jclp.22021>.
- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy, 13*(6), 353–379. <https://doi.org/10.1002/cpp.507>.

- Gillanders, D. T., Sinclair, A. K., MacLean, M., & Jardine, K. (2015). Illness cognitions, cognitive fusion, avoidance and self-compassion as predictors of distress and quality of life in a heterogeneous sample of adults, after cancer. *Journal of Contextual Behavioral Science*, 4(4), 300–311. <https://doi.org/10.1016/j.jcbs.2015.07.003>.
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Academic Press. <https://idostatistics.com/hedges-olkin-1985-statistical-methods-for-meta-analysis/>.
- Hupfeld, J., & Ruffieux, N. (2011). Validierung einer deutschen Version der Self-Compassion Scale (SCS-D). [Validation of a German version of the Self-Compassion Sale]. *Zeitschrift für Klinische Psychologie und Psychotherapie*, 40(2), 115–123. <https://doi.org/10.1026/1616-3443/a000088>.
- Huysmans, Z., & Clement, D. (2017). A preliminary exploration of the application of self-compassion within the context of sport injury. *Journal of Sport & Exercise Psychology*, 39, 56–66. <https://doi.org/10.1123/jsep.2016-0144>.
- Jeon, H., Lee, K., & Kwon, S. (2016). Investigation of the structural relationships between social support, self-compassion, and subjective well-being in Korean elite student athletes. *Psychological Reports*, 119(1), 39–54. <https://doi.org/10.1177/0033294116658226>.
- Johnson, E. A., & O'Brien, K. A. (2013). Self-Compassion soothes the savage ego-threat system: effects on negative affect, shame, rumination, and depressive symptoms. *Journal of Social and Clinical Psychology*, 32(9), 939–963.
- Kato, T. (2012). Development of the Coping Flexibility Scale: Evidence for the coping flexibility hypothesis. *Journal of Counseling Psychology*, 59(2), 262–273. <https://doi.org/10.1037/a0027770>.
- Kato, T. (2015). Frequently used coping scales: A meta-analysis. *Stress and Health: Journal of the International Society for the Investigation of Stress*, 31(4), 315–323. <https://doi.org/10.1002/smi.2557>.

- Keng, S. L., Choo, X., & Tong, E. M. W. (2018). Association between trait mindfulness and variability of coping strategies: A diary study. *Mindfulness*, *9*(5), 1423–1432. <https://doi.org/10.1007/s12671-018-0885-4>.
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry*, *11*(3), 129–141. https://doi.org/10.1207/S15327965PLI1103_01.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw-Hill. <https://psycnet.apa.org/record/1966-35050-000>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*: Springer. https://books.google.de/books/about/Stress_Appraisal_and_Coping.html?id=i-ySQQuUpr8C&redir_esc=y.
- Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology*, *92*(5), 887–904. <https://doi.org/10.1037/0022-3514.92.5.887>.
- Littleton, H., Horsley, S., John, S., & Nelson, D. V. (2007). Trauma coping strategies and psychological distress: A meta-analysis. *Journal of Traumatic Stress*, *20*(6), 977–988. <https://doi.org/10.1002/jts.20276>.
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, *32*(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>.
- Mantzios, M., Wilson, J. C., & Giannou, K. (2015). Psychometric properties of the Greek versions of the Self-Compassion and Mindful Attention and Awareness Scales. *Mindfulness*, *6*(1), 123–132. <https://doi.org/10.1007/s12671-013-0237-3>.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Plos Medicine*, *6*(7), 1–6. <https://doi.org/10.1371/journal.pmed.1000097.g001>.

- Mowlaie, M., Mikaeili, N., Aghababaei, N., Ghaffari, M., & Pouresmali, A. (2016). The relationships of sense of coherence and self-compassion to worry: The mediating role of personal intelligence. *Current Psychology, 10*(3), 630-636. <https://doi.org/10.1007/s12144-016-9451-1>.
- Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. *Clinical Psychology & Psychotherapy, 24*(2), 373–383. <https://doi.org/10.1002/cpp.2005>.
- Neff, K. (2003a). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*, 223-250. <https://doi.org/10.1080/15298860309027>.
- Neff, K. (2003b). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2*, 85–101. <https://doi.org/10.1080/15298860309032>.
- Neff, K., D., & Dahm, K., A. (2015). Self-compassion: What it is, what it does, and how it relates to mindfulness. In B.D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 121–137). Springer. https://doi.org/10.1007/978-1-4939-2263-5_10
- Neff, K. D., Hsieh, Y.-P., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity, 4*(3), 263–287. <https://doi.org/10.1080/13576500444000317>.
- Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007). An examination of self-compassion in relation to positive psychological functioning and personality traits. *Journal of Research in Personality, 41*(4), 908–916. <https://doi.org/10.1016/j.jrp.2006.08.002>.
- Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., Guo, H. X., Hirsch, J. K., Hupfeldt, J., Hutz, C. L., Kotsou, I., Lee, W. K., Montero-Marin, J., Sirois, F. M., de Souza, L. K., Svedsen, J. L., Wilkinson, R. B., & Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse

- samples: Support for use of a total score and six subscale scores. *Psychological Assessment*, *31*(1), 27–45. <https://doi.org/10.1037/pas0000629>.
- Odou, N., & Brinker, J. (2013). Exploring the relationship between rumination, self-compassion, and mood. *Self and Identity*, *13*(4), 449–459. <https://doi.org/10.1080/15298868.2013.840332>.
- Odou, N., & Brinker, J. (2014). Self-compassion, a better alternative to rumination than distraction as a response to negative mood. *The Journal of Positive Psychology*, *10*(5), 447–457. <https://doi.org/10.1080/17439760.2014.967800>.
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, *128*(1), 3–72. <https://doi.org/10.1037//0033-2909.128.1.3>.
- Petrocchi, N., Ottaviani, C., & Couyoumdjian, A. (2014). Dimensionality of self-compassion: Translation and construct validation of the self-compassion scale in an Italian sample. *Journal of Mental Health*, *23*(2), 72–77. <https://doi.org/10.3109/09638237.2013.841869>.
- Quintana, D. S. (2015). From pre-registration to publication: A non-technical primer for conducting a meta-analysis to synthesize correlational data. *Frontiers in Psychology*, *6*, 1549. <https://doi.org/10.3389/fpsyg.2015.01549>.
- Raes, F., Pommier, E., Neff, K. D., & van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, *18*(3), 250–255. <https://doi.org/10.1002/cpp.702>.
- Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist*, *41*(7), 813–819. <https://doi.org/10.1037//0003-066X.41.7.813>.
- Rouse, S. V. (2012). Universal worth: Construct and scale development. *Journal of Personality Assessment*, *94*, 62–72. <https://doi.org/10.1080/00223891.2011.627960> .

- Rubio-Aparicio, M., López-López, J. A., Viechtbauer, W., Marín-Martínez, F., Botella, J., & Sánchez-Meca, J. (2020). Testing categorical moderators in mixed-effects meta-analysis in the presence of heteroscedasticity. *The Journal of Experimental Education*, 88(2), 288–310. <https://doi.org/10.1080/00220973.2018.1561404>.
- Schmidt, F. L., & Hunter, J. E. (2014). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage. <https://idostatistics.com/hunter-schmidt-2014-methods-meta-analysis-correcting-error-bias-research-findings/>
- Schnider, K. R., Elhai, J. D., & Gray, M. J. (2007). Coping style use predicts posttraumatic stress and complicated grief symptom severity among college students reporting a traumatic loss. *Journal of Counseling Psychology*, 54(3), 344–350. <https://doi.org/10.1037/0022-0167.54.3.344>.
- Schwarzer, R. (1998). Stress and coping from a social-cognitive perspective. *Annals of the New York Academy of Sciences*, 851(1), 531–537. <https://doi.org/10.1111/j.1749-6632.1998.tb09032.x>
- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2014). Self-Compassion, Stress, and Coping in the Context of Chronic Illness. *Self and Identity*, 14(3), 334–347. <https://doi.org/10.1080/15298868.2014.996249>.
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129(2), 216–269. <https://doi.org/10.1037/0033-2909.129.2.216>.
- Smeets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. *Journal of Clinical Psychology*, 70(9), 794–807. <https://doi.org/10.1002/jcjp.22076>.

- Stanton, A. L., Kirk, S. B., Cameron, C. L., & Danoff-Burg, S. (2000). Coping through emotional approach: Scale construction and validation. *Journal of Personality and Social Psychology*, *78*(6), 1150–1169. <https://doi.org/10.1037//0022-3514.78.6.1150>.
- Tobin, D. L., Holroyd, K. A., Reynolds, R. V., & Wigel, J. K. (1989). The hierarchical factor structure of the coping strategies inventory. *Cognitive Therapy and Research*, *13*(4), 343–361. <https://doi.org/10.1007/BF01173478>.
- Viechtbauer, W., & Cheung, M. W.-L. (2010). Outlier and influence diagnostics for meta-analysis. *Research Synthesis Methods*, *1*(2), 112–125. <https://doi.org/10.1002/jrsm.11>
- Wald, A. (1943). Tests of statistical hypotheses concerning several parameters when the number of observations is large. *Transactions of the American Mathematical Society*, *54*(3), 426–482.
- Wong, C. C. Y., & Yeung, N. C. Y. (2017). Self-compassion and posttraumatic growth: Cognitive processes as mediators. *Mindfulness*, *4*(2), 107. <https://doi.org/10.1007/s12671-017-0683-4>.
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology. Health and Well-Being*, *7*(3), 340–364. <https://doi.org/10.1111/aphw.12051>.

Figure 1

Pyramid structure based on the underlying hierarchical scoping structure used in this meta-analysis



Figure 2

Prisma flow diagram depicting the sample development through the selection process

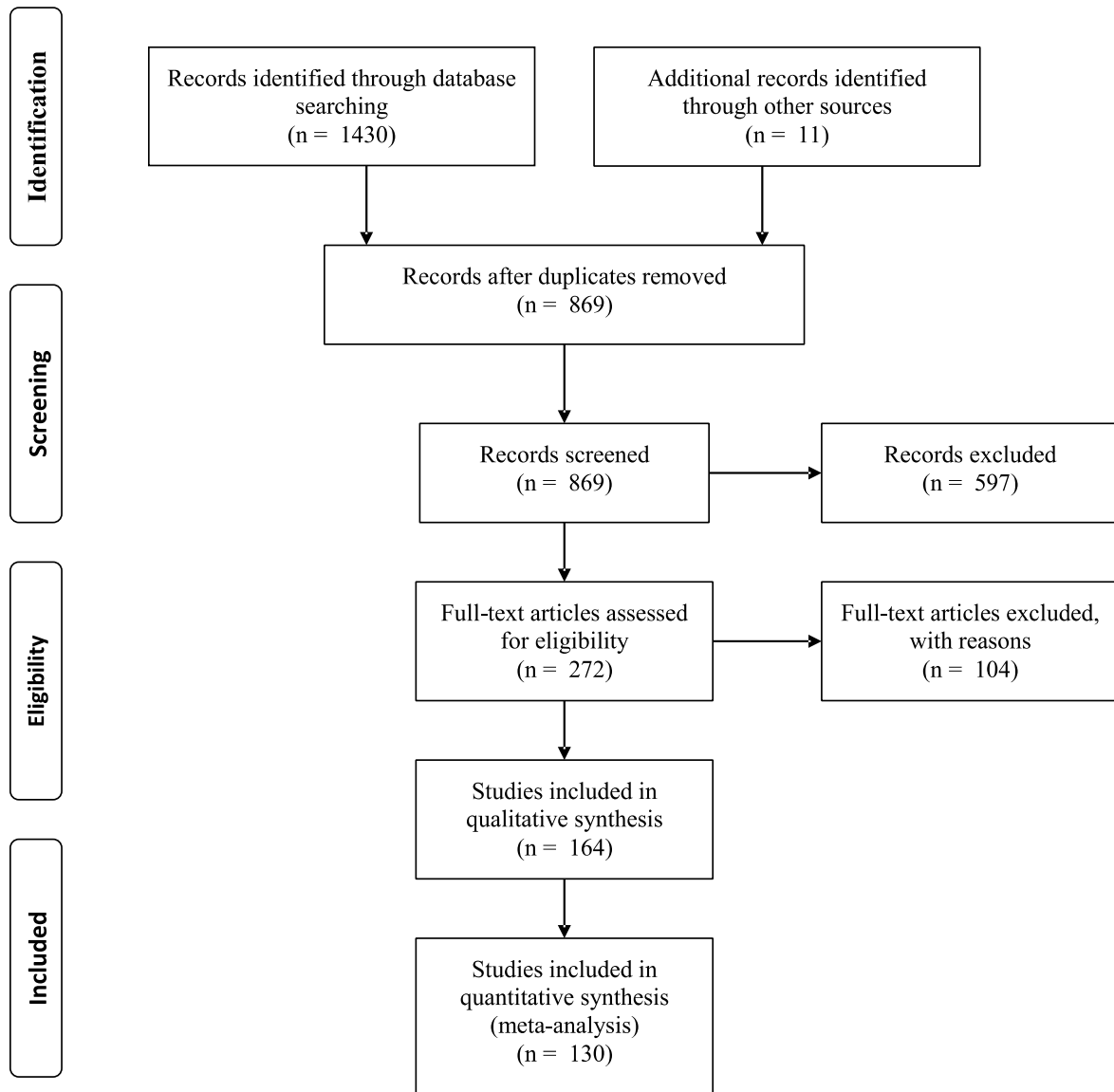


Table 1

Meta-analytic results on the association between self-compassion and coping and descriptive statistics of sample characteristics

	<i>k</i>	<i>n</i>	<i>r</i>	<i>Z</i>	95% CI	<i>Q</i>	<i>I²</i>	Female %	Mean Age	Region
Adaptive coping	42	15240	.306	7.926***	.226, .363	564.697***	0.056	59.13	32.26	36:6
Problem-focused coping	21	10957	.205	4.448**	.166, .291	259.046***	.041	57.15	26.35	16:5
Emotional approach coping	30	7542	.340	7.403***	.254, .420	308.941***	.062	60.77	34.00	27:3
Active coping	5	1987	.250	2.669**	.068, .416	51.039***	.042	66.21	27.63	4:1
Planning	6	2390	.218	2.427*	.043, .381	71.395***	.047	67.83	32.01	5:1
Religious coping	12	8576	.158	3.233**	.063, .251	82.626***	.024	60.85	24.61	10:2
Instrumental support coping	6	2320	.141	2.651**	.037, .242	24.858***	.014	59.13	25.92	4:2
Humor	5	1748	.096	1.851	-.006, .196	15.928***	.009	68.49	23.00	3:2
Emotional support coping	5	1995	.141	2.234*	.017, .260	24.143***	.016	43.46	21.57	3:2
Acceptance	15	3893	.312	5.718***	.209, .408	141.053***	.041	72.99	35.26	14:1
Positive reframing	13	4458	.396	8.201***	.309, .477	111.989***	.029	70.55	31.18	12:1
Maladaptive coping	103	27537	-.505	-22.480***	-.551, -.468	1761.191***	.053	68.09	32.93	97:5
Behavioral disengagement	5	1987	-.261	-4.511***	-.365, -.150	23.583**	.041	66.21	27.63	4:1
Denial	5	1982	-.212	-4.910***	-.292, -.129	14.858**	.006	71.41	28.19	4:1
Experiential avoidance	29	6256	-.555	-12.799***	-.617, -.485	351.879***	.059	69.09	28.46	28:0
Expressive suppression	3	1195	-.123	-1.548	-.274, .033	14.495***	6.034	62.40	37.22	3:0
Rumination	48	12491	-.534	-20.463***	-.574, -.492	338.005***	.031	68.88	34.04	45:3
Self-blame	8	2931	-.467	-9.843***	-.542, -.385	46.210***	.064	69.39	30.97	7:1
Worry	16	3723	-.606	-18.285***	-.556, -.661	73.326***	.015	68.58	31.33	15:1
Venting	4	1662	-.143	-1.822	-.289, .011	30.169***	.021	60.89	22.39	3:1
Distraction	3	1552	-.050	-0.828	-.165, .068	7.458*	.008	64.19	23.26	2:1
Substance use	9	5263	-.117	-6.874***	-.150, -.084	9.820	<.001	66.98	26.56	7:2

Notes. *k* = number of samples; *n* = sample size; *r* = average Pearson correlation coefficient; *Z* = z-value, Wald-Test; CI = confidence interval; *Q* = Cochran's Q statistic for between-study heterogeneity; *I²* = percentage of true between-study heterogeneity; *T²* = estimate for total amount of study heterogeneity in effect sizes; region: first digit = number of Western samples, second digit = number of Eastern samples
 p* < .05; *p* < .01; ****p* < .001

Table 2*Moderator Analysis on Relationship between Self-Compassion and Coping*

	<i>k</i>	<i>n</i>	<i>QM</i>	<i>b</i> ₁	<i>Z</i>
Adaptive coping	42	15240			
Age of participants	37	13780	19.263***	0.011	4.389***
Percentage of females	42	15240	0.044	0.000	0.210
Region	42	15240	2.582	0.171	1.607
Maladaptive coping	103	27537			
Age of participants	91	25485	0.052	-0.000	-0.227
Percentage of females	100	27066	0.033	-0.000	-0.181
Region	102	27390	0.000	0.003	0.029
Problem-focused coping	21	10957			
Age of participants	21	9651	11.945***	0.015	3.456***
Percentage of females	21	10957	5.055	0.007	2.248
Region	21	10957	0.247	0.055	0.496
Emotional approach coping	32	7542			
Age of participants	29	6770	9.719**	0.009	3.118**
Percentage of females	31	7542	0.000	0.000	0.020
Region	31	7542	1.657	0.201	1.287

Notes. *k* = number of samples; *n* = sample size; *QM* = Test of Moderators, omnibus test; *b*₁ = slope; *Z* = z-value, Wald-Test

p* < .01; *p* < .001

6 Study 1 and Study 2: Longitudinal Studies

The Mediating Role of Stress Processing in the Relation of Self-Compassion and Affective Well-Being: Evidence from two Longitudinal Studies.

Title:

The mediating role of stress processing in the relation of self-compassion and affective well-being: Evidence from two longitudinal studies.

Christina Ewert*

University of Potsdam, Department of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany. Tel.: 01515757459207, E-Mail: christina.ewert.inbox@gmail.com.

Anabel Buechner

Humboldt Universität zu Berlin, Department of Psychology, Rudower Chaussee 18,
12489 Berlin, Germany, E-Mail: buechnea@hu-berlin.de.

Michela Schröder-Abé

University of Potsdam, Department of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany, E-Mail: michela@uni-potsdam.de.

*Corresponding Author

Abstract

Objectives

A growing body of research has already demonstrated the link between self-compassion and improved well-being and mental health. Still, research has raised questions about the mechanisms underlying its beneficial effect on mental health outcomes. Thus, this research examines perceived stress and coping as mechanisms underlying the relation between self-compassion and affective well-being.

Methods

In two longitudinal studies with three measurement waves each, we assessed self-compassion, perceived stress, adaptive and maladaptive coping, and affective well-being. Study 1 analyzed a student sample (N = 684) across six weeks. Study 2 followed a population-based sample (N = 2934) across a two-month period.

Results

Cross-lagged-panel analyses indicated that perceived stress mediated the link between self-compassion and affective well-being in both longitudinal studies. Adaptive coping responses mediated this link in Study 2. Maladaptive coping responses did not act as mediators in both studies.

Conclusion

Self-compassion facilitates effective stress processing as a means to enhance affective well-being. Our work helps in understanding of underlying processes of the link between self-compassion and well-being.

Keywords: Self-compassion, stress, coping, affect, cross-lagged-panel analysis

People show remarkable individual differences in how they handle demanding or threatening situations. These differences have fundamental consequences for their affective well-being (AWB) (Lazarus & Folkman, 1986). Over the last two decades, self-compassion (SC), a construct with Buddhist roots, has gained increasing attention in psychological research. SC is considered a healthy stance towards the self as it entails comforting oneself in difficult times with warmth, balanced awareness, and a sense of interconnectedness (Neff 2003a, b). During the last years, empirical studies have established the mental health benefits of SC (Compas et al., 2017; Hollis-Walker & Colosimo, 2011, Zessin et al., 2015). Although positive effects of SC on AWB are well-established and health programs working with SC are currently booming in our society, research has raised questions about the underlying mechanisms through which SC has salutary effects on AWB (Zessin et al. 2015). In terms of beneficial processes related to higher AWB, Lazarus' (1966) focused on two factors – perceived stress and coping – which could be also important mechanisms in the relation between SC and AWB (e.g. Arch & Craske, 2006; Folkman et al., 1986; Penley & Tomaka, 2002). To date, studies with cross-sectional designs have explored the psychological processes underlying the beneficial effects of SC for mental and physical health. Taken together, self-compassionate individuals appear to react more adaptively to difficult situations in terms of their stress appraisals and coping (e.g. Arch et al., 2014; Ewert et al., 2018; Sirois et al., 2014). Thus, we expect that both can be mediators accountable for the positive link between SC and AWB. The present research takes into account methodological limitations of cross-sectional designs using a longitudinal design in two different samples. Our research aims at investigating the mediating role of both perceived stress and coping in the link between SC and AWB, i.e. the presence of positive affect as well as the absence of negative affect (Diener, 1984).

SC is a self-caring attitude encompassing three main positive facets, with each having a negative counterpart: (1) self-kindness (vs. self-judgment), which means to be

understanding and accepting towards one's shortcomings and mistakes and encountering oneself in times of failure and suffering with sympathy, patience, and care; (2) common humanity (vs. isolation), which entails seeing one's experiences as part of the shared human experience and keeping in mind that all humans are imperfect and make mistakes; (3) mindfulness (vs. over-identification), which involves holding negative mental states in balanced awareness (Neff, 2003b). A more recent meta-analysis by (Zessin et al., 2015) provided evidence for the positive effects of SC on a variety of well-being outcomes such as satisfaction with life, affect, and happiness. The results demonstrated a positive effect of SC on AWB of medium effect size. In addition, SC has been linked to positive mental health outcomes (MacBeth & Gumley, 2012; Muris & Petrocchi, 2017).

So far, research with cross-sectional designs has already shown that one possible mechanism mediating the link between SC and AWB is the amount of stress individuals experience in their lives. Experiencing stress is not only influenced by an event itself, but substantially by one's individual stress perception and appraisals (Lazarus, 1966). Personal resources are linked to emotions in appraising stressful events in a healthier way (Schwarzer et al., 1998). SC might function as a personal resource impacting stress appraisal processes positively. Due to these appraisals, the emotional meaning of situations will often be changed influencing one's AWB fundamentally (Lazarus and Folkman, 1986). Indeed, research already showed that individuals high in SC perceive weakness in demanding situations as less threatening when considering in light of the shared human experience (Neff & Dahm, 2015). In addition, several studies have demonstrated that individuals high in SC reported lower levels of stress (e.g., Brion et al., 2014; Homan & Sirois, 2017) and perceived stressful situations as more controllable. Moreover, results from intervention studies showing that an increase in SC was followed by a decrease in perceived stress, indicated that there may be a causal relation from SC to perceived stress e.g. (Gard et al., 2012; Neff & Germer, 2013). Research has also demonstrated that SC can help to experience distressing social events as

less stressful which comes along with less negative feelings (Ewert et al., 2018; Krieger et al., 2013). Therefore, we assume that more self-compassionate people appraise stressors as less negative and threatening, and, in turn, experience higher AWB.

Coping responses constitute a second key component in (Lazarus, 1966)' stress model. Hence, they might also play an important role in the link between SC and AWB. Coping is defined as "the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them" (Lazarus & Folkman, 1984, p.233). Thus, when people have already perceived stress, they often try to reduce the underlying threat by alleviating negative emotions and getting back their inner balance.

Neff (2003 a, b) assumed that self-compassion can facilitate adaptive coping responses and reduce maladaptive coping in terms of more salutary long-term solutions to threatening circumstances in life. This link might be due to the fact that SC entails a non-judgmental stance towards challenging experiences which can foster the ability to acknowledge the conditions just as they are (Neff et al., 2005). Thus, individuals high in SC might be less likely to deny or catastrophize stressful situations because they experience difficulties as an integral part of life (Neff, 2003b). In addition, as SC encompasses a caring rather than a harsh, judgmental stance towards the self in times of distress, individuals high in SC might be able to see their flaws in a realistic manner (Rubin et al., 2012; Sirois et al., 2014). Indeed, literature has indicated that self-compassionate individuals respond to stressful situations more adaptively (e.g., Ewert et al., 2018; Ewert et al., 2021; Homan & Sirois, 2017; Sirois et al., 2014). More recently, the associations between SC and coping strategies have been extensively reviewed. Overall SC has demonstrated positive associations with adaptive coping strategies (e.g., positive reframing, active coping) and negative associations with maladaptive coping responses (e.g., behavioral disengagement, denial) for a review (Ewert et al., 2021). Over the last few years, research focused more on the underlying processes behind the salutary effects of self-compassion on mental health. Less perceived stress (e.g., Arch et al.,

2014; Li et al., 2020) and healthier coping in demanding situations (e.g. Ewert et al., 2018; Homan & Sirois, 2017; Sirois et al., 2014) were identified as mediators in the link between self-compassion and affective well-being.

Summing up, research has suggested that both stress perception and coping responses might be processes underlying the link between SC and AWB. However, past studies have been limited in three ways: Most of them used cross-sectional designs that have been criticized for not being sufficient for investigating mediation effects (e.g., Cole & Maxwell, 2003; Selig & Preacher, 2009). Second, many studies have focused on specific clinical samples (e.g., Gillanders et al., 2015; Sirois et al., 2014), limiting the generalizability of the findings. Third, a key consideration missing from most previous studies is whether both perceived stress and coping mediate the relation between SC and AWB when considered simultaneously, thus controlling for their overlap. We conducted two longitudinal studies giving consideration to all three issues.

Building on previous theories and empirical research, the following hypotheses were derived: We hypothesized that trait SC predicts less perceived stress, more use of adaptive coping, and less use of maladaptive coping. In addition, we hypothesized that perceived stress and coping responses are related to AWB. Based on that, we hypothesized that perceived stress and coping responses mediate the relation between SC and AWB.

To test our hypotheses, we used a short-term three-wave longitudinal design and conducted autoregressive cross-lagged analyses in two studies. The three-wave autoregressive cross-lagged design is especially helpful with testing mediation hypotheses (Cole & Maxwell, 2003). In Study 1 we tested our hypotheses in a student sample. Study 2 was conducted to test whether our findings could be generalized to a population-based sample. All hypotheses were preregistered at the Open Science Framework for Study 2 (see at: https://osf.io/fhm9q/?view_only=577dd62d2f5548d59ccf703ee1d0d0a6).

Study 1

Methods

We conducted a longitudinal online study with three assessments with an interval of six weeks between each survey. Participants completed several self-report measures to assess SC, perceived stress, coping styles as well as positive and negative affect. All measures were assessed on all three occasions. Study 1 was part of a larger study which also included further variables. For an overview of other questionnaires, see Appendix A in the Supplemental Materials (https://osf.io/hwf2n/?view_only=8cab3488cd0548589274f0c96ec1396c). All participants were recruited via the participant pool of cognitive sciences at an urban university in Germany and in class announcements. Additionally, flyers were placed at urban meditation centers, yoga schools, fitness studios, super markets, and at public canteens. In return for participation, ten monetary gift cards were raffled among all participants. Moreover, students received study participation credit. In addition, individual feedback on several variables measured in the questionnaire was provided. All participants gave their informed content prior to the participation.

Participants

721 individuals initially participated in the survey via an electronic platform. As 37 of them either just opened the study link or only filled out the first page (demographic variables) of the survey, these individuals were excluded from further data analyses. This resulted in an actual dataset of 684 participants at Time 1 with a mean age of $M = 27.91$ years ($SD = 9.98$; range = 18 – 81) of whom 72.5 % ($N = 496$) classified as female, 26.5 % ($N = 181$) as male and 1 % ($N = 7$) as other. 463 of the participants were students (67.7 %); 109 (15.9 % of the total sample) studied Psychology. The second largest group was employees, comprising 16.5 % ($N = 113$) of the total sample. The remaining 112 participants (15.8 %) were subcategorized under self-employed or other. In terms of their educational background, 206 (30.1 %) of the participants held a university degree and 366 (53.5 %) a university entrance

qualification. Six weeks after Time 1 and Time 2, participants were automatically invited via e-mail to take part in Time 2 and Time 3 of the survey. If necessary, they were reminded once after three days. At Time 2, 516 participants of the initial sample participated in the survey. Participants reported a mean age of $M = 27.88$ years ($SD = 10.07$; range = 18 – 81). 384 (74.4 %) of the sample classified as female, 121 (23.4 %) as male. 357 of the participants were students (69.2 %); 89 of them were psychology students. The second largest group was employees, containing 16.3 % ($N = 84$) of the total sample. The remaining 75 participants (14.5 %) were subcategorized under self-employed or other. Referring to their educational background, 155 (30.0 %) of the participants had a university degree, and 276 (53.5 %) a university entrance qualification. At Time 3, 397 individuals participated again with a mean age of $M = 27.98$ years ($SD = 9.98$; range = 18 – 73). 74.8 % ($N = 297$) categorized themselves as female, 23.3 % ($N = 93$) as male. 271 of the participants were students (67.7 %); 70 (17.6 % of the total sample) studied Psychology. Employees comprised 16.6 % ($N = 66$) of the total sample. 60 of the sample (15.7 %) were subcategorized under self-employed or other. In terms of their educational background, 127 (32.0 %) of the participants held a university degree and 206 (51.9 %) a university entrance qualification.

We targeted a maximum number of participants per time point. According to (Fritz & Mackinnon, 2007), when regression estimates are small, 462 participants are required to detect indirect effects with 0.8 power using bias-corrected bootstrapping. Given that we used the full-information-maximum-likelihood (FIML) approach to deal with missing data (see section Study 1, Data Analyses), we judged a sample size of 684 participants at Time 1 as sufficient to achieve a statistical power of at least .08 for our main analyses.

Measures

Self-Compassion. SC was measured with the German version of the Self-Compassion-Scale (SCS-D; (Hupfeld & Ruffieux, 2011; Neff, 2003a). The scale encompasses 26 items and six subscales. These subscales are self-kindness (e.g., “I try to be understanding and patient

towards those aspects of my personality I don't like"), self-judgment (e.g., "I am disapproving and judgmental about my own flaws and inadequacies"), common humanity (e.g., "I try to see my failings as part of the human condition"), isolation (e.g., "When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world"), mindfulness (e.g., "When something painful happens I try to take a balanced view of the situation"), and over-identification (e.g., "When something upsets me I get carried away with my feelings"). The items are rated on a five-point Likert scale ranging from (1) "almost never" to (5) "almost always". In order to compute the total score, items referring to uncompassionate behavior (self-judgment, isolation, and over-identification) scales were reverse-coded, subscale means were calculated by averaging the item responses of each scale, and finally, a grand mean was computed from the six subscale means. Higher scores indicated more SC.

Perceived Stress. As an indicator for stress appraisals, the German version of the 10 item Perceived Stress Scale (PSS-10; Cohen et al., 1983; Klein et al., 2016) was used. Participants reported the degree to which they have appraised situations as unpredictable, uncontrollable, and overstraining in the past month, rated on a five-point Likert scale ranging from (0) never to (4) very often (e.g., "In the last month, how often have you been angered because of things that were outside of your control?").

Coping. To assess adaptive and maladaptive coping, the German adaptation of the Brief COPE (Carver, 1997; Knoll et al., 2005) was used. The Brief COPE assesses 14 different coping strategies measured by a scale with two items each, resulting in a total of 28 items. In the current study, the Brief COPE was used in a retrospective dispositional format by asking the participants how they have been dealing with stressful situations. Items were rated on a four-point Likert scale from (1) not at all to (4) very much. For the purpose of the current study, only six strategies were considered for further analysis due to their relevance with SC (Ewert et al., 2021). Scale scores were computed by summing up the two items of

each scale. Higher values indicate more habitual use of the coping strategy. In order to create a composite score for the variable adaptive coping, the means of the following scales were averaged: active coping (e.g., “I’ve been concentrating my efforts on doing something about the situation I’m in”), positive reframing (e.g., “I’ve been looking for something good in what is happening”), and acceptance (e.g., “I’ve been learning to live with it”). Similarly, the scales for denial (e.g., “I’ve been refusing to believe that it has happened”), behavioral disengagement (e.g., “I’ve been giving up the attempt to cope.”), and self-blame (e.g., “I’ve been criticizing myself”) were averaged to compute a composite score for maladaptive coping.

Affective Well-being. We assessed two components of AWB, positive and negative affect, with the standardized German version of the 20 item Positive and Negative Affect Schedule (PANAS; (Krohne et al., 1996; Watson et al., 1989). The two affect dimensions are measured by 10 items each. The Positive Affect scale measures the extent to which the participant experienced enthusiasm, activeness, and alertness (e.g., interested, proud, determined), while the Negative Affect scale assesses distress and aversive mood states (e.g., irritable, guilty, scared). In the current study, participants were asked to rate on a five-point scale from (1) very slightly to (5) very much the extent to which they experience each mood state in general. Scale scores are computed by averaging item responses. Higher values indicate more experience of positive and less experience of negative affect. All item responses were summed up and averaged to compute a scale score of AWB. Before, items of negative affect were inverted.

Data Analyses

Associations between the variables were tested by Pearson correlations. To test our hypotheses, we implemented a cross-lagged panel model (CLPM) for longitudinal data using Mplus (Muthén & Muthén, 2017). The three-wave autoregressive cross-lagged design can be used to examine how constructs are related to each other over time while simultaneously

controlling for the stability of the investigated constructs over time (Kline, 2005). According to Selig and Preacher (2009, p.147), the CLPM “allows time for causes to have their effects, supports stronger inference about the direction of causation in comparison to models using cross-sectional data and reduces the probable parameter bias that arises when using cross-sectional data.” Overviews of the use of the CLPM for mediation analyses are given by (Cole & Maxwell, 2003)) as well as MacKinnon (2008). To explore the mediation hypotheses, we examined whether each indirect effect was significant ($p < .05$) and explored the 95% confidence intervals of each effect in this mode by using 5000 samples with a bias-corrected approach (Preacher & Hayes, 2008). If effects were marginally significant ($p < .10$), we also reported 90% confidence intervals if the value zero was included. As a missing data estimation approach for structural equation modeling, we used full information maximum likelihood (FIML). All available data can be used by this approach by approximating an individual likelihood function for every participant built on all existing variables (Enders & Bandalos, 2001).

The CLPM in Figure 1 shows that SC was used as the independent variable, perceived stress, adaptive coping, and maladaptive coping were used as parallel mediator variables, and AWB was used as the criterion variable. While controlling for their autoregressive effects, cross-lagged paths ran from SC at Time 1 to perceived stress and coping responses at Time 2, and to AWB at Time 2 and Time 3 as well as from SC at Time 2 to perceived stress, coping responses, and affective wellbeing at Time 3. For reasons of parsimony, we followed the guidelines given by (Zyphur et al., 2020) and treated autoregressive paths from Time 1 to Time 2 as equivalent to autoregressive paths from Time 2 to Time 3 for the each variable. In addition, we implemented cross-lagged paths from perceived stress and both coping styles at Time 1 to AWB at Time 2, and from perceived stress and coping responses at Time 2 to AWB at Time 3. Three indirect paths were relevant for our mediation hypothesis: The one from SC at Time 1 to AWB at Time 3 through perceived stress at Time 2, as well as the two paths from

SC at Time 1 to AWB at Time 3 through adaptive and maladaptive coping responses. Figure 1 demonstrates the corresponding autoregressive paths as well as the cross-lagged paths established in the cross-lagged panel model. The data file for Study 1 can be found in Appendix C at the OSF.

Based on recommended guidelines, several indicators of fit were used to evaluate our path model. We reported chi-square statistics (χ^2), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean squared residual (SRMR). Good fit indices are indicated by values equal or greater than 0.95 for CFI, and equal or less than 0.05 for RMSEA and SRMR, whereas an acceptable fit is assumed by values greater than or equal to .90 for CFI and less than or equal to .08 for RMSEA and SRMR (Little, 2013). Since chi-square-tests are sensitive to sample-size and often provide significant results (Marsh et al., 2004), the other applied goodness-of-fit indices are more reliable in this context and were preferred to examine the goodness-of-fit in both studies. We also checked suggested modification indices and, if theoretically reasonable, implemented additional substantive paths. Modification indices are a way of improving the model by identifying parameters which, if included, would improve model fit starting with the largest sensible modification and ending with the last highest one which was required to approach acceptable fit indices.

Results and brief discussion

Preliminary analyses

Pearson correlations, descriptive statistics (mean, SD), and internal consistencies for all variables are presented in Table 1. All correlations turned out to be in anticipated directions. As expected, almost all correlations showed medium to strong associations (Cohen, 1988) between SC and the other variables at all three times of the measurement, whereas associations between adaptive and maladaptive coping turning out to be rather small.

Main analyses

To examine our hypotheses, we tested the indirect effects between SC at Time 1 as the independent variable; stress, adaptive coping, and maladaptive coping at Time 2 as mediator variables controlling for each other; and AWB at Time 3 as the criterion variable. We had hypothesized that trait SC would predict less perceived stress, more use of adaptive coping, and less use of maladaptive coping. We had also hypothesized that perceived stress, adaptive and maladaptive coping would mediate the relations between SC and AWB.

Fit statistics for our model showed good to excellent fit to the data ($\chi^2(52) = 120.96, p < .001, RMSEA = .04, SRMR = .05, CFI = .98$). All autoregressive paths were highly significant (all $ps < .001$). With two exceptions, cross-lagged effects between all relevant variables turned out to be significant, indicating a negative relation between SC at Time 1 and perceived stress ($B = -0.221, SE = 0.069; p < .01, 95\%CI = [-0.359, -0.091]$) and maladaptive coping responses ($B = -0.013, SE = 0.005; p < .01, 95\%CI = [-0.023, -0.004]$) at Time 2, and a positive relation with adaptive coping at Time 2 ($B = 0.030, SE = 0.006; p < .001, 95\%CI = [0.018, 0.043]$). Furthermore, cross-lagged effects between perceived stress at Time 2 and AWB at Time 3 were negative and significant ($B = -0.011, SE = 0.004; p < .01, 95\%CI = [-0.019, -0.003]$). However, the cross-lagged effects between coping responses at Time 2 and AWB at Time 3 did not turn out to be significant (adaptive coping: $B = -0.017, SE = 0.036; p = .636, 95\%CI = [-0.089, 0.055]$; maladaptive coping: $B = 0.019, SE = 0.045; p = .677, 95\%CI = [-0.069, 0.108]$). The indirect effect of SC at Time 1 on AWB at Time 3 via perceived stress at Time 2 was significant, while the indirect effects via adaptive and maladaptive coping responses at Time 2 were not significant. Table 2 presents an overview of indirect effect estimates. For effect estimates of all autoregressive and additional cross-lagged paths which were implemented in our model, see Appendix B (Table S2) in the Supplemental Materials at OSF.

The findings of Study 1 provided initial support for our hypotheses. SC predicted lower perceived stress. Moreover, results indicated that individuals higher in SC made greater

use of adaptive coping strategies and lower use of maladaptive coping strategies. The mediation hypothesis could only partially be supported. As predicted, the effects of SC on AWB were mediated by perceived stress. However, since adaptive and maladaptive coping responses were not significantly related to AWB in the cross-lagged model, these variables did not turn out to be mediators in this sample. Nevertheless, these findings are promising in showing that SC has salutary effects on AWB through more effective stress regulation to some extent, in this context mainly through perceiving events as less stressful.

Study 2

Study 1 was limited in terms of generalizability due to the fact that most of the participants were young, female, and highly educated individuals. To overcome this methodological issue, Study 2 was conducted to examine the relations between SC, perceived stress, coping responses, and AWB in a representative population-based sample. We preregistered our hypotheses, design, and analyses online at the Open Science Framework before starting with data collection (see preregistration at: https://osf.io/fhm9q/?view_only=577dd62d2f5548d59ccf703ee1d0d0a6). We had originally preregistered the hypothesis whether the effects of SC on perceived stress and coping held when controlling for the effects of neuroticism for the GESIS data (Study 2). However, due to panel time restrictions, we could not include neuroticism in Study 2. For more information, see at supplemental materials (Appendix B, Table S4 and S5).

Methods

Participants and procedure

We used data from a probability-based panel operated by GESIS (GESIS Panel), which collects survey data from a German-speaking population aged between 18 and 70 years permanently residing in Germany (Bosnjak et al., 2018). To compensate for non-coverage among non-internet users and to include all persons not willing to participate in online surveys into the panel, each bimonthly GESIS Panel data collection wave is administered in

two self-administered (mixed) survey modes, namely (1) an online mode through web-based surveys and (2) an off-line mode through paper-and-pencil surveys sent via postal mail. The present study design was submitted to the GESIS Panel, peer-reviewed, and received a five-minute slot per requested panel wave. We collected our variables of interest in three waves from August to December 2018 (waves df, ef, ff) with a two months' interval between each wave. All variables relevant to our hypotheses were measured at each of the three waves. Some measures needed to be shortened (e.g., SC) to suit the conditions of the GESIS Panel (limitation of five minutes for each wave). In total, 3148 individuals participated in at least one of the three relevant waves of the GESIS Panel, 214 of them did not participate in the part of the panel our questionnaires of interest were implemented in. Thus in total, the final sample included 2934 participants with a mean age of $M = 52.76$ years ($SD = 13.07$; range = 23 – 74), of whom 47.3% classified as female, 44.5% as male, and 8.2% did not provide information regarding gender. In terms of their educational background, 33.9% of the participants had a university degree, and over 44% held a university entrance qualification. More than half of the participants (55.8%) completed either a college degree, a vocational training or held none of them. Only three percent were students, and around 10% did not provide information regarding educational background. At Time 1, 2765 individuals participated in the survey with a mean age of $M = 52.75$ years ($SD = 13.08$; range = 24 – 74) of whom 47.6% ($N = 1315$) classified as female, 52.4% ($N = 1450$) as male. In terms of their educational background, around five percent ($N = 137$) of the participants were students, 1594 (57%) completed either college or vocational training, 945 (34.2%) of all participants held a university degree, and 1223 (44.2%) a university entrance qualification. At Time 2, 2710 participated in the survey with a mean age of $M = 52.72$ years ($SD = 13.08$; range = 24 – 74). 1281 (48%) of the sample classified as female, 1429 (52%) as male. Referring to their educational background, 132 of the participants were students (4.9%), 1596 (58.9%) completed either college or vocational training, 937 (34.6%) of the participants had a

university degree, and 1198 (44.9 %) a university entrance qualification. At Time 3, 2668 individuals participated with a mean age of $M = 52.71$ years ($SD = 13.06$; range = 24 – 74). 48.1 % ($N = 1304$) categorized themselves as female, 51.9 % ($N = 1364$) as male. In terms of their educational background, 133 of the participants were students (5 %), 1592 (59.7 %) completed either college or vocational training, 930 (34.9 %) of the participants held a university degree, and 1198 (44.2 %) a university entrance qualification.

Measures

Self-Compassion. SC was measured with the adapted German version of the Self-Compassion-Scale-Short (SCS-D-Short; Hupfeld & Ruffieux, 2011; Neff, 2003a). This version consists of 12 items. The measure includes six subscales consisting of two items for each scale: Responses are given on a five-point Likert scale ranging from (1) “almost never” to (5) “almost always.” In order to compute the total score, a grand mean was computed from the six subscale means. Higher scores indicated higher trait SC.

Perceived Stress. As an indicator for perceived stress, the German version of the 10 item Perceived Stress Scale (PSS-10; Cohen et al., 1983; Klein et al., 2016) was used. We implemented five of the ten items from the original version, which had the highest factor loadings. Participants reported the degree to which they had appraised situations as unpredictable, uncontrollable, and overstraining in the past month, rated on a five point Likert scale ranging from (0) “never” to (4) “very often” (e.g., “Relating to the last month, how often have you been upset because of something that happened unexpectedly?”).

Coping. As in Study 1, adaptive and maladaptive coping were measured with the German adaptation of the Brief COPE (Carver, 1997; Knoll et al., 2005). Responses were given on a four-point Likert scale from (1) “not at all” to (4) “very much.” Due to the restricted number of items that could be implemented in the panel, we included four of the six strategies used in Study 1: positive reframing, acceptance, denial, and behavioral disengagement. To create a composite index score for the variable adaptive coping, the means

of the positive reframing and the acceptance scale were averaged. The means of denial and behavioral disengagement were averaged to form a composite score for maladaptive coping.

Well-being. AWB was assessed with a 10-item short form (Thompson, 2016) of the standardized version of the 20 item Positive and Negative Affect Schedule (PANAS; Krohne et al., 1996; Watson et al., 1989). The two dimensions, positive (e.g., active, inspired, alert) and negative affect (e.g., upset, hostile, shamed), were measured by five items each. Responses to which extent they experience each affect in general were given on a five-point scale from (1) “never” to (5) “very much.” Items of negative affect were inverted and then averaged, and finally all item responses were summed up and averaged to compute the scale score of AWB.

Data analytic strategies

We used the same data analytic strategy as in Study 1. Due to strict provisions of German data protection law, we cannot make the data of Study 2 publicly available. However, the data are available from the Probability-Based Mixed-Mode Access GESIS Panel (for requests, please contact info@gesis.org). Furthermore, the input files (Mplus-Syntax) for all model analyses of Study 1 and 2 can be found in Appendix D. In contrast to Study 1, the autoregressive paths from Time 1 to Time 2 were not treated as equivalent to the autoregressive paths from Time 2 to Time 3 because this would have resulted in insufficient model fit (see Zyphur et al., 2020).

Results and brief discussion

Preliminary analyses

In Table 3, intercorrelations, descriptive statistics (mean, SD), and internal consistencies for all variables can be found. All correlation coefficients turned out to be in the predicted directions. Comparable to Study 1, relations between adaptive and maladaptive coping showed zero correlations.

Main analysis

As in Study 1, to investigate the effect of SC (Time 1) on AWB (Time 3) via stress regulation processes (Time 2), a cross-lagged model was implemented. Without including modification indices, our model fit indices were not acceptable in this case. Hence, we followed the suggestion of modification analyses and decided to apply the same additional autoregressive paths which has already been indicated by modification indices analyses for the model in Study 1. Our model showed acceptable to very good fit indices ($\chi^2(45) = 775.40, p < .001$, RMSEA = .07, SRMR = .07, CFI = .95). All autoregressive paths were highly significant (all $ps < .001$).

The cross-lagged effects between SC at Time 1 and perceived stress at Time 2 ($B = -1.290, SE = 0.292; p < .001, 95\%CI = [-1.881, -0.730]$) as well as adaptive coping responses at Time 2 ($B = 0.432, SE = 0.058; p < .001, 95\%CI = [0.315, 0.545]$) were significant. By contrast, the cross-lagged coefficient between SC at Time 1 and maladaptive coping responses ($B = -0.080, SE = 0.056; p = .154, 95\%CI = [-0.187, 0.034]$) at Time 2 were not significant. In addition, cross-lagged effects between perceived stress at Time 2 and AWB at Time 3 ($B = -0.021, SE = 0.003; p < .001, 95\%CI = [-0.026, -0.014]$) and between maladaptive coping responses at Time 2 and AWB at Time 3 ($B = -0.036, SE = 0.014; p < .01, 95\%CI = [-0.063, -0.010]$) were negative and significant; whereas adaptive coping at Time 2 and AWB at Time 3 were only marginally positively associated ($B = 0.030, SE = 0.018; p = .092, 90\%CI = [0.002, 0.059]$). Effect estimates of all autoregressive and additional cross-lagged paths which were implemented in our model are presented in Appendix B (Table S3) in the Supplemental Materials at OSF.

To investigate whether the relation between SC (Time 1) and AWB (Time 3) was mediated by a healthier stress regulation in terms of less perceived stress and more salutary coping responses (Time 2), we explored each indirect effect (see Table 4). The indirect effect of SC on AWB via perceived stress was significant, whereas the indirect effect via adaptive coping was only marginally significant. The indirect effect for maladaptive coping was not

significant.

Study 2 was conducted to replicate and generalize the findings of Study 1 by exploring the relation between SC, stress processing, and AWB in a representative population-based sample. We found that more self-compassionate individuals perceived less stress over a two-month period. They also reported more use of adaptive coping, although, inconsistent with Study 1, they did not demonstrate less use of maladaptive coping responses. Replicating Study 1, we found that lower levels of perceived stress mediated the effects of SC on AWB. In line with our hypotheses, we also found that adaptive coping also acted as a mediator. In sum, our results showed that a more effective stress regulation (i.e., lower levels of perceived stress and more use of adaptive coping) explain why individuals with higher levels of SC experienced higher levels of AWB.

General Discussion

The aim of the present research was to identify psychological processes accountable for the positive association between SC and AWB. We investigated the role of perceived stress and coping as possible mediators of this link in two longitudinal studies. Supporting our first hypothesis, SC significantly predicted less perceived stress in both studies, which is in line with previous research (e.g., Neff & Pommier, 2013; Sbarra et al., 2012; Sirois, 2014). Referring to the transactional model of stress (Lazarus, 1966), SC seems to provide a framework that enables individuals to perceive situations in a less threatening manner (primary appraisal) and/or to strengthen their perception that they are able to cope with the situational demands (secondary appraisal). These results are also in line with Gilbert's general assumption (Gilbert, 2005) that having a more self-compassionate attitude facilitates sensations such as safeness and security which helps to diminish perceiving harm and distress and, thus, maintain positive emotions.

In addition, SC predicted more use of adaptive coping in both studies, which is in line with previous literature (e.g., Ewert et al., 2018; Gillanders et al., 2015; Sirois et al., 2015).

Our hypothesis that SC predicts maladaptive coping responses was only partially supported. In Study 1, SC predicted maladaptive coping over a six-week period, which is in line with current literature (e.g., Chishima et al. 2018, Sirois et al. 2014). Thus, self-compassionate individuals appeared to engage less in strategies that are dysfunctional for their AWB in the long run, such as trying to act as if the stressor were not real, neglecting it, and attributing the distressing situation as one's own fault. In the cross-lagged model in Study 2 however, SC at Time 1 showed no significant association with maladaptive coping two months later. An explanation might be that the scales had to be shortened in Study 2 and, therefore may have tapped into aspects of maladaptive coping that are less relevant for the link between SC and maladaptive coping (Ewert et al. 2021).

Grounded in the transactional stress theory (Lazarus and Folkman, 1984), one of the central aims of this work was to investigate if perceived stress and coping might work as mechanisms underlying the link between SC and AWB. In both studies, the positive link between SC and AWB was consistently mediated through more benign stress appraisals. However, referring to coping as a mediator of the link between SC and AWB, maladaptive coping did not turn out to be a mediator between SC and AWB in both studies. Adaptive coping only marginally mediated the link between SC and AWB in Study 2. Clearly, these results need to be replicated, and further research is needed to explain the differences between the two studies. One explanation for the inconsistencies concerning coping responses might be that some coping strategies that were not measured in our studies are more relevant for the mediational link between SC and AWB. Maladaptive coping responses such as worry and rumination that have emerged from different theoretical backgrounds showed a strong connection with SC (for a review see (Ewert et al., 2021), and already turned out to be consistent mediators between SC and affect in past research (e.g., Fresnics & Borders, 2016; Raes, 2010). However, past studies exploring coping as underlying process in the connection of SC and AWB were mainly cross-sectional, thus it is still unclear if these effects could be

demonstrated in other designs such as longitudinal or experimental studies. This should be explored in more detail in future studies. Nevertheless, especially healthier stress perception seems to be the most robust mediator of the link between self-compassion and affective well-being over time (also cf. Ewert et al., submitted, for further evidence at the within-person level). These results are in line with Gilbert's general suggestion (Gilbert, 2005) that more self-compassionate individuals find it easier to feel safe and secure in challenging situations than individuals with lower levels of self-compassion which, in turn, protects them from harmful and distressing emotions. Thus, more self-compassionate individuals may be able to experience demanding situations in a calmer and more accepting way preventing them from negative feelings and facilitating positive emotions right from the onset without the need of any further coping responses.

Strengths, Limitations, and Directions for Future research

One notable strength of our work is its three-wave autoregressive cross-lagged design, which is a good approach for the investigation of effects over time of one construct on another and the other way around, while at the same time controlling for the stability of the examined constructs over time (Kline, 2005). Such designs are especially helpful with exploring some of the questions and misconceptions that sometimes emerge in longitudinal tests of mediational models. Thus, it decreases the possible parameter biases that can arise when working with cross-sectional data (Cole & Maxwell, 2003). Moreover, we tested our hypotheses in two different samples, one of which was a population-representative sample. By that, we could generalize and replicate our findings. In addition, we preregistered our hypotheses and the design of Study 2. Nevertheless, there are some limitations in both studies which we want to address in the following.

First, our correlational study design limits the ability to draw causal conclusions. Our longitudinal design and CLPM are an improvement compared to the majority of past studies that used cross-sectional designs. But still, our designs are non-experimental, thus third

variables might account for the effects or other direction are thought to be possible (e.g. influences of coping responses on self-compassion). So far, there have been only a few studies using experimental designs to investigate the causal relation between SC and coping, focusing only on the strategy of rumination (Johnson & O'Brien, 2013; Odou & Brinker, 2013, 2014). Thus, further research should investigate the assumed direction of causality by using self-compassion interventions in the long term and experimental manipulations in the short term (e.g., Finlay-Jones, 2017; Germer & Neff, 2013; Smeets et al., 2014).

Second, despite the fact that we used a population-representative sample, the generalizability of our results might still be limited due to the fact that data were collected in a culture with a Western perspective on the investigated relations only. Due to differences in stress regulation, the links between self-compassion, stress processing and affective well-being might vary between Western and Eastern cultures (Oyserman et al., 2002). Thus, future studies should investigate whether our results can also be replicated in Eastern countries.

Third, due to the time limit given by the GESIS Panel for external studies, measures of all variables had to be shortened as well. These abbreviated versions of the scales might also reflect only an insufficient amount of the whole content of the assessed constructs. Consequently, further studies should use the full version of measures assessing the relation among all variables to replicate our findings. Still, access to the panel enabled us to investigate our hypotheses in a representative sample which can be considered a particular strength of our study. Moreover, we were only able to include a subset of adaptive and maladaptive coping strategies. Including further coping strategies as a mediator between SC and AWB might shed more light on the underlying processes.

Another point to mention is that retrospective scales were used. The responses to items concerning global evaluations might be influenced by temporary factors, such as transitory mood and situational variables (see for an overview Pavot et al., 2018). Therefore, further studies should investigate the research questions using methods such as experience sampling

that reduce memory bias (Csikszentmihalyi & Larson, 2014). Using a daily assessment method would also provide insights into whether the trait associations investigated in the current two studies can be transferred to the state level of the variables and to the within-person effects of momentary SC on stress processing and AWB (cf. Ewert et al., submitted). Moreover, the time between the three waves was rather short, which might have contributed to higher autoregressive paths. Therefore, less variance remains to be explained by the cross-lagged paths. This is important for the relation between coping and AWB, which was significant when only correlations were considered but turned out non-significant in our cross-lagged model.

In addition, future studies should investigate possible moderator variables such as the type of stressor which might moderate the link of SC and AWB through stress processing. For example, the link between SC and AWB might be mediated by maladaptive coping responses only in uncontrollable situations such as a life-threatening illness.

More research is also needed in order to understand the precise relation between SC and stress appraisals. Our results suggest that appraisals are the dominant process through which SC unfolds its beneficial effects on AWB. With the exception of Chishima et al. (2018), all studies examining the link between SC and stress appraisals have measured these exclusively as a unidimensional construct, not taking into account that there might be differences in the relation between SC and primary vs. secondary appraisal. For example, more SC could unfold higher perceived controllability of stressful situations leading to especially more problem-focused coping and less maladaptive coping, whereas SC might diminish the perceived threat, which in turn, could result in engaging in both more problem-focused and more maladaptive coping (Chishima et al., 2018). A separate investigation would allow more insights into whether the reducing influence of SC on perceived stress is equally vs. differently determined through primary and secondary appraisals.

Conclusion

The findings of both studies are promising in showing that SC has salutary effects AWB through stress processing reflected in perceived stress. Summarizing the findings of the two studies, it can be assumed that the predominant way through which a self-compassionate attitude unfolds its protective effect on AWB is appraising situations as less stressful. There was also some preliminary evidence that coping with stressful situations in a more adaptive way has some role in the relation between SC and AWB. However, the mediating role may depend on specific coping responses, which should be explored in future research. We hope that this work gives a better understanding of stress perception and coping responses as processes underlying the link between SC and AWB.

Supplementary Information The online version contains supplementary material available at https://osf.io/hwf2n/?view_only=8cab3488cd0548589274f0c96ec1396c

Declarations

Acknowledgments:

The authors would like to thank Jan Krause for his help in preparing the data for final analyses. We also would like to thank the GESIS Panel for the opportunity to implement our questionnaires on three consecutive panel waves.

Author Contributions:

CE: designed the study, did the literature search, provided the data analyses and wrote the paper; AB: collaborated with the design and data collection, assisted with the literature search, data analyses, collaborated in writing of the manuscript; MSA: assisted to design the study and with data analyses, wrote the manuscript. All authors approved the final version of the manuscript for submission.

Funding Information:

This work was funded by a scholarship from the Potsdam Graduate School to the first author. Furthermore, the authors disclosed receipt of the following support for the research and publication of this article: The establishment of the GESIS Panel was funded by the German Federal Ministry of Education and Research.

Compliance with Ethical Standards**Conflict of Interest:**

The authors declare that they have no conflict of interest (see also below attached file ‘declaration of competing interest’).

Ethical Approval:

All procedures performed in the current work involving human participants were in accordance with the ethical standards of the University of Potsdam. The procedures used in this work also adhere to the tenets of the Declaration of Helsinki. Furthermore, the research design of Study 2 was approved by the research committee of the GESIS Panel.

Informed consent:

Informed consent was obtained from all participants included in the two studies.

References

Arch, J. J., Brown, K. W., Dean, D. J., Landy, L. N., Brown, K. D., & Laudenslager, M. L. (2014). Self-compassion training modulates alpha-amylase, heart rate variability, and subjective responses to social evaluative threat in women. *Psychoneuroendocrinology*, *42*, 49–58. <https://doi.org/10.1016/j.psyneuen.2013.12.018>

- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, *44*(12), 1849–1858. <https://doi.org/10.1016/j.brat.2005.12.007>
- Bosnjak, M., Dannwolf, T., Enderle, T., Schaurer, I., Struminskaya, B., Tanner, A., & Weyandt, K. W. (2018). Establishing an Open Probability-Based Mixed-Mode Panel of the General Population in Germany. *Social Science Computer Review*, *36*(1), 103–115. <https://doi.org/10.1177/0894439317697949>
- Brion, J. M., Leary, M. R., & Drabkin, A. S. (2014). Self-compassion and reactions to serious illness: The case of HIV. *Journal of Health Psychology*, *19*(2), 218–229. <https://doi.org/10.1177/1359105312467391>
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, *4*(1), 92–100. https://doi.org/10.1207/s15327558ijbm0401_6
- Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, *61*(1), 679–704. <https://doi.org/10.1146/annurev.psych.093008.100352>.
- Chishima, Y., Mizuno, M., Sugawara, D., & Miyagawa, Y. (2018). The influence of self-compassion on cognitive appraisals and coping with stressful events. *Mindfulness*, *9*(6), 1907–1915. <https://doi.org/10.1007/s12671-018-0933-0>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* 2 edition Lawrence Erlbaum. Hillsdale, NJ.
- Cohen, S., Kamarck, & Mermelstein Robin (1983). A Global Measure of Perceived Stress. *Journal of Health and Social Behaviour*, *24*(4), 385–396.
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, *112*(4), 558–577. <https://doi.org/10.1037/0021-843X.112.4.558>

- Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin, 143*(9), 939–991. <https://doi.org/10.1037/bul0000110>
- Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experiencesampling method. In M. Csikszentmihalyi & R. Larsen (Eds.), *Flow and the foundations of positive psychology* (pp. 35-54). Springer. https://link.springer.com/chapter/10.1007%2F978-94-017-9088-8_3
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542–575. <https://doi.org/10.1037/0033-2909.95.3.542>
- Enders, C., & Bandalos, D. (2001). The Relative Performance of Full Information Maximum Likelihood Estimation for Missing Data in Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal, 8*(3), 430–457. https://doi.org/10.1207/S15328007SEM0803_5
- Ewert, C., Gaube, B., & Geisler, F. C. M. (2018). Dispositional self-compassion impacts immediate and delayed reactions to social evaluation. *Personality and Individual Differences, 125*, 91–96. <https://doi.org/10.1016/j.paid.2017.12.037>
- Ewert, C.; Hoffmann, C., F., A.; Schröder-Abé M. (2022). *Be a friend to yourself – Stress processing mediates the link between momentary self-compassion and affective well-being* [Manuscript submitted for publication]. Department of Personality Psychology and Psychological Assessment, University of Potsdam.
- Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-Compassion and Coping: a Meta-Analysis. *Mindfulness, 12*(5), 1063–1077. [https://doi.org/10.1007/s12671-020-01563-](https://doi.org/10.1007/s12671-020-01563-8)

- Finlay-Jones, A. L. (2017). The relevance of self-compassion as an intervention target in mood and anxiety disorders: A narrative review based on an emotion regulation framework. *Clinical Psychologist, 21*(2), 90–103. <https://doi.org/10.1111/cp.12131>
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology, 50*(3), 571–579. <https://doi.org/10.1037/0022-3514.50.3.571>
- Fresnics, A., & Borders, A. (2016). Angry Rumination Mediates the Unique Associations Between Self-Compassion and Anger and Aggression. *Mindfulness, 50*(7), 554–564. <https://doi.org/10.1007/s12671-016-0629-2>
- Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science, 18*(3), 233–239. <https://doi.org/10.1111/j.1467-9280.2007.01882.x>
- Gard, T., Brach, N., Hölzel, B. K., Noggle, J. J., Conboy, L. A., & Lazar, S. W. (2012). Effects of a yoga-based intervention for young adults on quality of life and perceived stress: The potential mediating roles of mindfulness and self-compassion. *The Journal of Positive Psychology, 7*(3), 165–175. <https://doi.org/10.1080/17439760.2012.667144>
- Germer, C. K., & Neff, K. D. (2013). Self-compassion in clinical practice. *Journal of Clinical Psychology, 69*(8), 856–867. <https://doi.org/10.1002/jclp.22021>
- Gilbert. (2005). *Compassion: Conceptualisations, research and use in psychotherapy: & (2005). Focused therapies and compassionate mind training for shame and self-attacking. In (Ed.), Compassion: Conceptualisations, research and use in psychotherapy (pp. 263–325). Hove, UK: Routledge.*
- Gillanders, D. T., Sinclair, A. K., MacLean, M., & Jardine, K. (2015). Illness cognitions, cognitive fusion, avoidance and self-compassion as predictors of distress and quality of life in a heterogeneous sample of adults, after cancer. *Journal of Contextual Behavioral Science, 4*(4), 300–311. <https://doi.org/10.1016/j.jcbs.2015.07.003>

- Hollis-Walker, L., & Colosimo, K. (2011). Mindfulness, self-compassion, and happiness in non-meditators: A theoretical and empirical examination. *Personality and Individual Differences, 50*(2), 222–227. <https://doi.org/10.1016/j.paid.2010.09.033>
- Homan, K. J., & Sirois, F. M. (2017). Self-compassion and physical health: Exploring the roles of perceived stress and health-promoting behaviors. *Health Psychology Open, 4*(2), 2055102917729542. <https://doi.org/10.1177/2055102917729542>
- Hupfeld, J., & Ruffieux, N. (2011). Validierung einer deutschen Version der Self-Compassion Scale (SCS-D). *Zeitschrift Für Klinische Psychologie Und Psychotherapie, 40*(2), 115–123. <https://doi.org/10.1026/1616-3443/a000088>
- Johnson, E. A., & O'Brien, K. A. (2013). Self-Compassion soothes the savage ego-threat system: effects on negative affect, shame, rumination, and depressive symptoms. *Journal of Social and Clinical Psychology, 32*(9), 939–963. <https://doi.org/10.1521/jscp.2013.32.9.939>
- Klein, E. M., Brahler, E., Dreier, M., Reinecke, L., Muller, K. W., Schmutzer, G., Wolfling, K., & Beutel, M. E. (2016). The German version of the Perceived Stress Scale - psychometric characteristics in a representative German community sample. *BMC Psychiatry, 16*, 159. <https://doi.org/10.1186/s12888-016-0875-9>
- Kline, R. B. (2005). *Principles and practice of structural equation modeling (Second ed.)*. Guilford Publications. https://books.google.de/books/about/Principles_and_Practice_of_Structural_Eq.html?id=EkMVZUxZrgIC&redir_esc=y
- Knoll, N., Rieckmann, N., & Schwarzer, R. (2005). Coping as a mediator between personality and stress outcomes: A longitudinal study with cataract surgery patients. *European Journal of Personality, 19*(3), 229–247. <https://doi.org/10.1002/per.546>
- Krieger, T., Altenstein, D., Baettig, I., Doerig, N., & Holtforth, M. G. (2013). Self-compassion in depression: Associations with depressive symptoms, rumination, and

- avoidance in depressed outpatients. *Behavior Therapy*, *44*(3), 501–513.
<https://doi.org/10.1016/j.beth.2013.04.004>
- Krohne, H. W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der "Positive and Negative Affect Schedule" (PANAS) *Diagnostica*, *42*(2), 139–158.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw-Hill.
<https://psycnet.apa.org/record/1966-35050-000>.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer
[.https://books.google.de/books/about/Stress_Appraisal_and_Coping.html?id=iySQQuUpr8C&redir_esc=y](https://books.google.de/books/about/Stress_Appraisal_and_Coping.html?id=iySQQuUpr8C&redir_esc=y).
- Lazarus, R. S., & Folkman, S. (1986). Cognitive theories of stress and the issue of circularity. In M.H. Appley, R. Trumbull (Eds.) *Dynamics of Stress. The Plenum Series on Stress and Coping* (pp. 63–80). Springer. http://dx.doi.org/10.1007/978-1-4684-5122-1_4.
- Li, Y., Deng, J., Lou, X., Wang, H., & Wang, Y. (2020). A daily diary study of the relationships among daily self-compassion, perceived stress and health-promoting behaviours. *International Journal of Psychology : Journal International De Psychologie*, *55*(3), 364–372. <https://doi.org/10.1002/ijop.12610>
- Little, T. D. (2013). *Longitudinal structural equation modeling. Methodology in the Social Sciences*. The Guilford Press.
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, *32*(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Routledge.
<https://www.routledge.com/Introduction-to-Statistical-Mediation-Analysis/MacKinnon/p/book/9780805864298>

- Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In Search of Golden Rules: Comment on Hypothesis-Testing Approaches to Setting Cutoff Values for Fit Indexes and Dangers in Overgeneralizing Hu and Bentler's (1999) Findings. *Structural Equation Modeling: A Multidisciplinary Journal*, *11*(3), 320–341.
https://doi.org/10.1207/s15328007sem1103_2
- Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. *Clinical Psychology & Psychotherapy*, *24*(2), 373–383.
<https://doi.org/10.1002/cpp.2005>
- Muthén, L.K. and Muthén, B.O. (2017). *Mplus User's Guide (Eighth ed.)*.
https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf
- Neff, K. (2003b). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, *2*, 85–101. <https://doi.org/10.1037/e342422004-001>
- Neff, K. D. (2003a). The Development and Validation of a Scale to Measure Self-Compassion. *Self and Identity*, *2*, 223–250.
<https://doi.org/10.1080/15298860390209035>
- Neff, K. D. & Dahm, K. A. (2015). Self-compassion: what it is, what it does, and how it relates to mindfulness. In Ostafin, B.D., Robinson, M. D.& Meier, B. P. (Eds.), *Handbook of mindfulness and selfregulation* (pp. 121–137). Springer.
https://doi.org/10.1007/978-1-4939-2263-5_10.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, *69*(1), 28–44.
<https://doi.org/10.1002/jclp.21923>
- Neff, K. D., Hsieh, Y.-P., & Dejjitrat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, *4*(3), 263–287.
<https://doi.org/10.1080/13576500444000317>

- Odou, N., & Brinker, J. (2013). Exploring the Relationship between Rumination, Self-compassion, and Mood. *Self and Identity, 13*(4), 449–459.
<https://doi.org/10.1080/15298868.2013.840332>
- Odou, N., & Brinker, J. (2014). Self-compassion, a better alternative to rumination than distraction as a response to negative mood. *The Journal of Positive Psychology, 10*(5), 447–457. <https://doi.org/10.1080/17439760.2014.967800>
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*(1), 3–72. <https://doi.org/10.1037//0033-2909.128.1.3>
- Pavot, W. (2018). The cornerstone of research on subjective well-being: Valid assessment methodology. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of wellbeing*. DEF Publishers. <https://www.semanticscholar.org/paper/The-Cornerstone-of-Research-on-Subjective-Valid-Oishi/e37c922e4cea6b89782d6f9f59bfed7f42249dc4>.
- Penley, J. A., & Tomaka, J. (2002). Associations among the Big Five, emotional responses, and coping with acute stress. *Personality and Individual Differences, 32*(7), 1215–1228. [https://doi.org/10.1016/S0191-8869\(01\)00087-3](https://doi.org/10.1016/S0191-8869(01)00087-3)
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. <https://doi.org/10.3758/brm.40.3.879>
- Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences, 48*(6), 757–761. <https://doi.org/10.1016/j.paid.2010.01.023>
- Rubin, D. C., Hoyle, R. H., & Leary, M. R. (2012). Differential predictability of four dimensions of affect intensity. *Cognition & Emotion, 26*(1), 25–41.
<https://doi.org/10.1080/02699931.2011.561564>

- Sbarra, D. A., Smith, H. L., & Mehl, M. R. (2012). When leaving your ex, love yourself: Observational ratings of self-compassion predict the course of emotional recovery following marital separation. *Psychological Science*, *23*(3), 261–269.
<https://doi.org/10.1177/0956797611429466>
- Schwarzer, R. (1998). Stress and coping resources: Theory and review. In Schwarzer, R. (Ed.), *Advances in health psychology research* (pp. 1-24). Berlin: Freie Universität Berlin. Institut für Arbeits-, Organisations und Gesundheitspsychologie
- Selig, J. P., & Preacher, K. J. (2009). Mediation Models for Longitudinal Data in Developmental Research. *Research in Human Development*, *6*(2-3), 144–164.
<https://doi.org/10.1080/15427600902911247>
- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2014). Self-Compassion, Stress, and Coping in the Context of Chronic Illness. *Self and Identity*, *14*(3), 334–347.
<https://doi.org/10.1080/15298868.2014.996249>
- Smeets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. *Journal of Clinical Psychology*, *70*(9), 794–807. <https://doi.org/10.1002/jclp.22076>
- Thompson, E. R. (2016). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology*, *38*(2), 227–242. <https://doi.org/10.1177/0022022106297301>
- Watson, D., Clark, L. A., & Tellegen, A. (1989). Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070.
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology. Health and Well-Being*, *7*(3), 340–364. <https://doi.org/10.1111/aphw.12051>

Zyphur, M. J., Allison, P. D., Tay, L., Voelkle, M. C., Preacher, K. J., Zhang, Z.,
Hamaker, E. L., Shamsollahi, A., Pierides, D. C., Koval, P., & Diener, E. (2020).
From Data to Causes I: Building A General Cross-Lagged Panel Model (GCLM).
Organizational Research Methods, 23(4), 651–687.
<https://doi.org/10.1177/1094428119847278>.

Figure 1

Three-wave cross-lagged model for time-lagged effects between self-compassion (SC), perceived stress (ST), adaptive coping (AC), maladaptive coping (MC), and affective well-being (AWB). Dashed lines indicate stability paths among the same construct, whereby bold solid lines represent cross-lagged paths interesting for our mediation model. Autoregressive paths from T1 to T3, error variables, and covariances were omitted from the diagram.

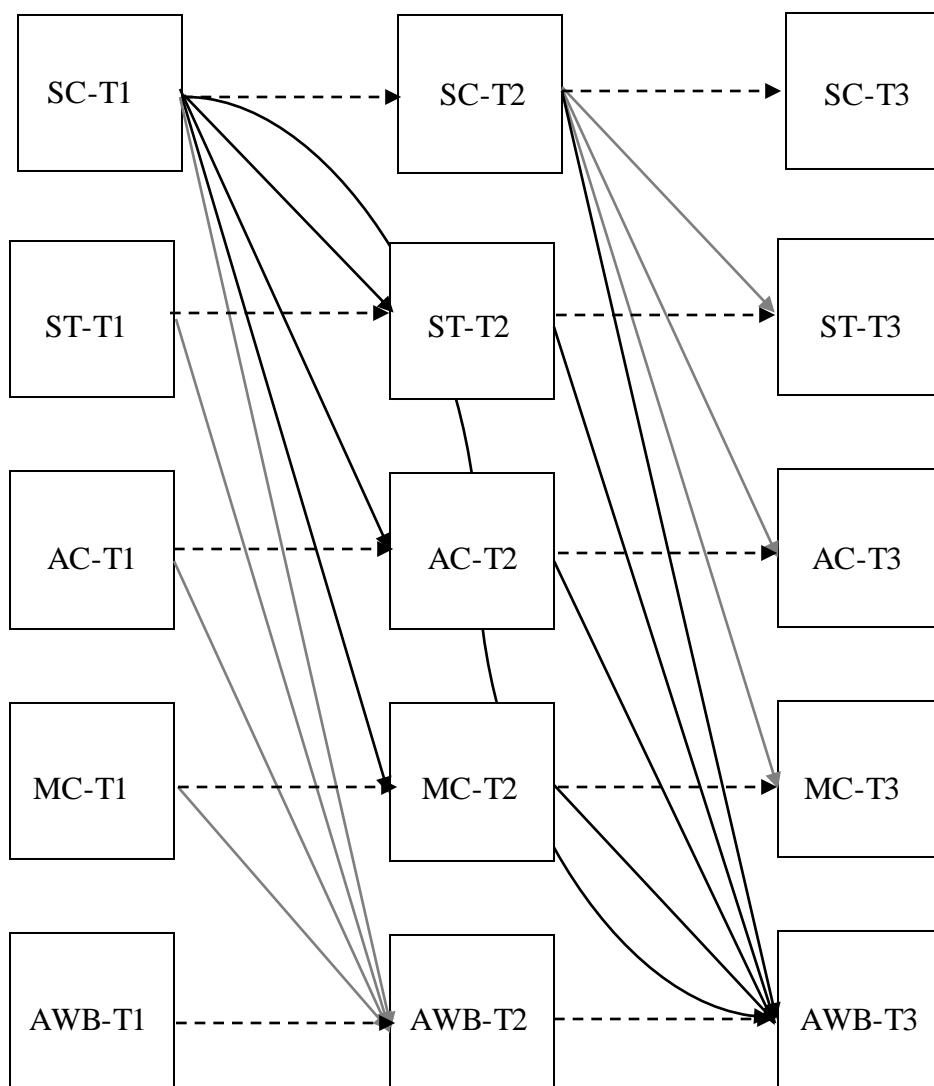


Table 1

Pearson correlations, means, standard deviations, and reliabilities of all variables assessed in Study 1

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SCT1	(.93)														
2. SCT2	.85	(.93)													
3. SCT3	.82	.90	(.94)												
4. ST T1	-.51	-.53	-.52	(.87)											
5. ST T2	-.44	-.58	-.53	.66	(.87)										
6. ST T3	-.45	-.56	-.60	.62	.69	(.89)									
7. ACT1	.47	.52	.52	-.45	-.31	-.31	(.73)								
8. ACT2	.47	.53	.53	-.35	-.45	-.43	.57	(.75)							
9. ACT3	.40	.55	.55	-.28	-.33	-.39	.57	.63	(.77)						
10. MC T1	-.41	-.49	-.42	.46	.35	.35	-.31	-.24	-.17	(.70)					
11. MC T2	-.34	-.47	-.42	.43	.45	.39	-.21	-.26	-.19	.54	(.72)				
12. MC T3	-.37	-.47	-.49	.33	.44	.51	-.19	-.26	-.23	.45	.60	(.72)			
13. AWB T1	.42	.49	.48	-.59	-.45	-.42	.41	.37	.34	-.41	-.39	-.35	(.89)		
14. AWB T2	.40	.50	.45	-.48	-.54	-.46	.38	.44	.35	-.34	-.43	-.39	.84	(.89)	
15. AWB T3	.42	.47	.43	-.48	-.49	-.56	.38	.37	.44	-.30	-.37	-.41	.82	.87	(.89)
M	18.12	18.10	18.31	19.67	18.85	18.80	2.60	2.60	2.57	1.76	1.76	1.70	3.52	3.55	3.60
SD	3.39	3.88	3.99	6.47	6.51	6.95	0.58	0.56	0.55	0.47	0.48	0.46	0.59	0.61	0.60

Notes. Cronbach's alphas are provided in parentheses on the diagonal; SC = Self-compassion, ST = Stress, AC = Adaptive Coping,

MC = Maladaptive Coping, AWB = Affective Well-Being. Bold correlations are significant $p < .01$.

Table 2

Indirect effects of self-compassion on affective well-being via perceived stress and coping (Study 1)

	Estimate	Standard Error	95% CI
SC-T1 → ST-T2 → AWB-T3	.002*	.001	[.001, .005]
SC-T1 → AC-T2 → AWB-T3	-.001	.001	[-.003, .002]
SC-T1 → MC-T2 → AWB-T3	<.001	.001	[-.002, .001]

Notes. CI = Confidence interval; SC = Self-compassion, ST = Stress, AC = Adaptive Coping, MC = Maladaptive Coping, AWB = Affective Well-being. ** $p < .05$.

Table 3

Pearson correlations, means, standard deviations, and reliabilities of all variables assessed in Study 2

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SC T1	(.76)														
2. SC T2	.58	(.79)													
3. SC T3	.55	.61	(.79)												
4. ST T1	-.21	-.24	-.23	(.81)											
5. ST T2	-.21	-.24	-.21	.71	(.81)										
6. ST T3	-.19	-.24	-.25	.68	.71	(.81)									
7. AC T1	.34	.35	.34	-.23	-.18	-.18	(.68)								
8. AC T2	.31	.41	.33	-.20	-.22	-.20	.50	(.67)							
9. AC T3	.27	.35	.39	-.16	-.16	-.21	.48	.50	(.68)						
10. MC T1	-.01	-.06	-.10	.46	.37	.28	.03	-.05	-.02	(.72)					
11. MC T2	-.03	-.03	-.07	.43	.31	.31	-.02	.02	-.03	.56	(.70)				
12. MC T3	-.04	-.08	-.11	.33	.34	.39	-.06	-.06	.02	.55	.55	(.76)			
13. AWB T1	.27	.26	.27	-.64	-.55	-.56	.27	.26	.20	-.36	-.32	-.36	(.76)		
14. AWB T2	.27	.30	.29	-.56	-.62	-.59	.24	.29	.21	-.31	-.35	-.37	.74	(.78)	
15. AWB T3	.23	.27	.32	-.57	-.55	-.67	.23	.25	.24	-.31	-.31	-.39	.73	.76	(.77)
M	3.02	3.02	3.04	12.85	12.87	12.50	2.81	2.79	2.80	1.87	1.82	1.83	3.80	3.80	3.84
SD	0.17	0.18	0.17	3.23	3.31	3.25	0.48	0.49	0.49	0.55	0.53	0.56	0.49	0.49	0.49

Notes. Cronbach's alphas are provided in parentheses on the diagonal; SC = Self-Compassion, N = Neuroticism, ST = Stress, AC = Adaptive

Coping, MC = Maladaptive Coping, AWB = Affective Well-Being; Bold correlations are significant, $p < .01$.

Table 4

*Indirect effects of self-compassion on affective well-being via perceived stress and coping
(Study 2)*

	Estimate	Standard Error	95% CI
SC-T1 → ST-T2 → AWB-T3	.027***	.007	[.028, .063]
SC-T1 → AC-T2 → AWB-T3	.013 ⁺	.008	[-.001, .029]
SC-T1 → MC-T2 → AWB-T3	.003	.002	[-.001, .009]

Notes. CI = Confidence interval; SC = Self-compassion, ST = Perceived Stress, AC =

Adaptive Coping, MC = Maladaptive Coping, AWB = Affective Well-Being;

*** $p < .001$; marginally significant = ⁺ $p < .010$, 90% CI = [.001, .026].

7 Study 3: Ambulatory Assessment Study

Stress Processing Mediates the Link between Momentary Self-Compassion and Affective Well-Being

Title:

**Stress processing mediates the link between momentary self-compassion and
affective well-being**

Christina Ewert*

University of Potsdam, Department of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany. Tel.: 01515757459207, E-Mail: christina.ewert.inbox@gmail.com.

Cosma Frauke Antonia Hoffmann

University of Greifswald, Institute of Psychology, Franz-Mehring-Straße 47,
17487 Greifswald, Germany.

Michela Schröder-Abé

University of Potsdam, Department of Psychology, Karl-Liebknecht-Straße 24-25,
14476 Potsdam, Germany.

*Corresponding Author

Abstract

Objectives

While the positive effects of trait self-compassion on affective well-being are widely known, within-person effects of state self-compassion and underlying mechanisms between state self-compassion and affective well-being have rarely been investigated. The current study aimed at examining whether perceived stress and healthier coping responses are mediators in the relation between momentary self-compassion and affective well-being.

Methods

A total of 213 participants completed measures of momentary self-compassion, momentary perceived stress, engagement and disengagement coping responses, as well as affective well-being (i.e., presence of positive and absence of negative affect) via their smartphones. The ambulatory assessment design included three measurements per day (morning, afternoon, evening) for seven days.

Results

Multilevel modeling revealed that within-persons, momentary levels of self-compassion were related to momentary levels of stress, coping responses, and affective well-being components. 1-1-1 multilevel mediation analyses were conducted and demonstrated that, at the within-person level, momentary self-compassion was related to more positive and less negative affect via perceived stress and facilitating healthy coping responses. The within-person relations of the original 1-1-1 multilevel mediation could partially be replicated in an alternative model with momentary self-compassion one occasion prior and positive affect. However, the link between self-compassion one occasion prior and negative affect was only mediated by perceived stress.

Conclusions

This work helps to understand the processes underlying the adaptive effects of momentary

self-compassion on momentary affective well-being on a given occasion. Theoretical and practical implications of these findings are discussed.

Keywords: self-compassion, stress processing, coping, affective well-being

Over the last two decades, a growing body of research in positive psychology has focused on psychological strengths and potentials (Seligman & Csikszentmihalyi, 2000). In search of factors strengthening the resilience against psychopathology and facilitating higher well-being, self-compassion has sparked increasing attention in psychological research. Among the definitions of self-compassion, one common approach is to think of it as an alternative to self-criticism and general negative self-evaluation (Neff, 2003a,b). Thus, individuals high in self-compassion generally face challenging or threatening situations and daily hassles with warmth, balanced awareness, and a sense of inter-connectedness (Neff, 2003b). According to Neff (2003b), self-compassion encompasses the following interrelated components: (a) self-kindness can be described as a careful and understanding attitude to oneself rather than engaging in severe self-judgment; (b) common humanity helps with considering one's individual experiences as part of a larger human experience rather than being fulfilled with self-pity and bitterness; and (c) mindfulness is understood as holding one's painful thoughts and feelings in balanced awareness rather than over-identifying with them.

A growing body of research has supported that self-compassion and well-being are substantially associated. Self-compassion has been repeatedly linked to mental health outcomes (e.g., Hiraoka et al., 2015; MacBeth & Gumley, 2012) and various well-being components (for a review, Zessin et al., 2015). Moreover, a meta-analysis points towards a causal effect of trait self-compassion on well-being (Zessin et al., 2015). However, it is still unclear how self-compassion unfolds its beneficial effects. Understanding the processes

underlying the link between self-compassion and well-being is the next step to establish this construct in psychological research (MacBeth & Gumley, 2012; Zessin et al., 2015).

Recent research has suggested that individual stress processing might play a significant role in the association between self-compassion and affective well-being. It is widely known that stress appraisals and adaptive responses to stressful situations are essential to affective well-being outcomes (Lazarus & Folkman, 1986). According to Lazarus' (1966) transactional model of stress and coping, the experience of stress results not exclusively from events themselves but also from the appraisal that such events charge or exceed a person's adaptive capacity (i.e. perceived stress).

Individuals often reappraise the emotional importance or meaning of situations. This can be done either by changing their view of the situation or their perceived ability to handle a potentially demanding experience. Confronted with stressful situations, individuals engage in various coping strategies to ease stress for re-establishing their inner balance. Lazarus and Folkman (1984, p.233) defined coping as "the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them." Since then, the concept of coping has been developed and can be described as the regulation of a broader range of functions in reaction to stress (Compas et al., 2017). While reviews have described over 100 taxonomies to model the structure of coping, none of these categorizations can entirely account for its complexity (Carver & Connor-Smith, 2010; Connor-Smith & Flachsbart, 2007; Skinner et al., 2003). However, some consensus does exist about the hierarchical structure of coping strategies. Many approaches use the common distinction of coping into two overarching factors to structure and classify different coping strategies with an interchangeable nomenclature: Most of them differentiate between engagement and disengagement coping (Carver & Connor-Smith, 2010; Compas et al., 2017), while others use terms such as 'approach and avoidance coping' instead (Carver et al., 1989; Connor-Smith & Flachsbart, 2007; Weinstein et al., 2009). In this study, we refer to the terms engagement and

disengagement coping as it rather seems to be a broader taxonomy including also approach and avoidance coping responses. Engagement coping contains activities that involve a cognitive, emotional, or behavioral ‘turning toward’ stressful situations (e.g., positive reframing and active coping). In contrast, disengagement coping reflects a defensive form of regulation, including escaping from negative stimuli (e.g., behavioral disengagement) and perceiving threatening stimuli distortedly (e.g., denial). In terms of the long-term consequences of coping strategies for an individual’s functionality, engagement coping strategies are considered healthy as they entail sustainable efforts to deal with the stressor or associated emotions actively and thus contribute to more sustainable long-term solutions to problems, whereas disengagement coping strategies share that they try to evade from stressors or accompanied emotions and are generally considered rather dysfunctional in the long run (Carver & Connor-Smith, 2010; Compas et al., 2017; Connor-Smith et al., 2000).

A growing body of literature indicates that self-compassionate individuals appraise and respond to stressful situations more adaptively (e.g., Ewert et al., 2021; Homan & Sirois, 2017; Sirois et al., 2014). When looking at stress appraisals, it seems reasonable to expect that self-compassion has a beneficial effect on one’s stress perception: Neff (2003b) has argued early that self-compassionate individuals engage in a warm and balanced stance towards the self rather than in harsh self-criticism in difficult situations. It has been demonstrated that self-compassion helps to experience one’s failures and weaknesses as less threatening as it comes along with the attitude that all humans are imperfect (Neff & Dahm, 2015). In addition, several studies have shown that self-compassion is linked to lower levels of perceived stress (e.g. Brion et al., 2014; Ewert et al., 2018; Homan & Sirois, 2017) and to the perception of stressful situations as more controllable (Chishima et al., 2018).

The positive effects of self-compassion on coping responses seem apparent as well: Early on, it has been suggested that a self-compassionate attitude may facilitate engagement coping forms because it entails the ability to experience one’s feelings with clarity. Neff et al.

(2005) argued that it helps to generate an accepting and balanced attitude towards one's flaws and shortcomings, diminishing the tendency to construe negative experiences in a gloomy, self-destructive way. Recent studies have shown that a self-compassionate orientation might help take a stressor as it is instead of avoiding painful feelings or ruminating on one's sufferings and failures (e.g., Fresnics & Borders, 2016; Krieger et al., 2013). Furthermore, it has been widely demonstrated that self-compassion helps to forgive one's weaknesses and makes it less necessary to deny one's failures and misery (e.g., Ewert et al., 2018; Gillanders et al., 2015). Overall, self-compassion has shown positive relations with engagement coping strategies and negative associations with disengagement coping responses (for reviews, see Allen & Leary, 2010; Ewert et al., 2021).

More recently, researchers have started to investigate the underlying psychological processes behind the beneficial effects of self-compassion on mental and physical health using mediation analysis. Less perceived stress (e.g., Arch et al., 2014; Li et al., 2020), less unproductive repetitive thinking, (e.g., Diedrich et al., 2016), and healthier coping in demanding situations (Homan & Sirois, 2017; Sirois et al., 2014) have been identified as mediators. Moreover, interpreting stressful social events as less demanding or challenging mediates the effect of self-compassion on negative emotions (e.g., Ewert et al., 2018; Krieger et al., 2016). In sum, being more self-compassionate seems to facilitate healthier stress processing under challenging circumstances. Hence, we hypothesize that both, perception of stress and coping, can be mediators responsible for the positive association between self-compassion and affective well-being.

Almost all previous research has focused on self-compassion as a trait (e.g., Adams & Leary, 2007; Neff et al., 2005; Stutts et al., 2018). However, an individual's behavior also depends on situational cues and is not necessarily expressed consistently across diverse situations that differ in meaning (e.g., Mischel, 1968). Thus, individuals may feel and behave more or less self-compassionately at different points in time or across different situations.

This is in line with more recent personality theories, which conceptualize traits as density distributions of states (e.g., Fleeson & Jayawickreme, 2015). Personality differences in mean levels of behavior (between-person-variance) are always accompanied by substantial intra-individual variability (within-person variance) over occasions and contexts (e.g., Fleeson & Jayawickreme, 2015; Fournier & Moskowitz, 2018; Moskowitz & Fournier, 2015). Thus, personality variables such as self-compassion have both trait and state-like properties (Fleeson & Jayawickreme, 2015; Moskowitz et al., 1997). In line with this, a few more recent studies using experience sampling designs have demonstrated that a third to almost a half of the variance of self-compassion occurred within participants (Breines & Chen 2013; Kelly & Carter, 2015; Li et al., 2020), whereas around one-third (Zuroff et al., 2021) to two-thirds of the variance occurred between persons (Breines & Chen, 2013; Kelly & Stephen, 2016). Thus, the level of self-compassion within an individual does indeed fluctuate over time to a considerable extent.

Research on the relation of self-compassion with health outcomes and stress processing (Dupasquier et al., 2020; Krieger et al., 2013) has focused on between-person effects in an experience sampling context, which means that a person with higher levels of self-compassion generally deals with stressors in a healthier way and experiences higher mental and physical health. However, acknowledging that self-compassion fluctuates across times and situations also brings within-person effects into focus: Fluctuations in momentary self-compassion may be related to fluctuations in other state variables such as affective well-being. These within-person effects might differ from the between-person effects reported so far, and the underlying processes might differ as well. Such differences might lead to different practical implications. For example, between-persons results do not indicate whether or to what extent a given individual might gain from treating themselves more self-compassionately in a given moment than what is typical for them. Indeed, first studies have shown that positive outcomes of self-compassion might not only be due to being a self-

compassionate individual in general but also to treating oneself with more self-compassion on a given day or a particular occasion, and that analysis on both levels could even reveal different associations (Breines & Chen, 2013; Kelly & Stephen, 2016). For example, Kelly and Stephen (2016) found that daily self-compassion and body area satisfaction were positively related at the between-person level but unrelated at the within-person level. This could also be the case for the relation between self-compassion and other mental health variables.

To our knowledge, only three studies have investigated the within-person effects of self-compassion. These studies were conceptualized as daily diary studies, which lasted for four to seven days assessing the daily variables once in the evening. Two studies focused only on self-compassion and eating behavior (Breines & Chen, 2013; Kelly & Stephen, 2016) and demonstrated that on days when female students had higher levels of self-compassion, they reported less chaotic and more intuitive eating. One study among Chinese individuals was on self-compassion, eating, and exercise behaviors and also included perceived stress as a potential mediator (Li et al., 2020). The study found that within an individual, higher daily self-compassion was related to healthier daily eating behavior via less perceived stress on that day. Nevertheless, it is yet unclear whether these results may be generalized beyond eating and exercise behaviors.

Building on Lazarus' stress model (1966), it seems plausible that natural fluctuations in momentary levels of self-compassion within an individual might influence momentary levels of perceived stress and the use of specific coping responses, which might result in higher affective well-being for this individual on a specific occasion. So far, the mediational role of stress processing between self-compassion and mental health has mainly been explored at the between-person level (e.g., Arch et al, 2014, Ewert et al, 2018, Homan & Sirois, 2017). Considering the underlying processes between self-compassion and mental health at the within-person level, there is initial evidence for the mediational role of perceived

stress, albeit only for outcomes such as eating and exercise behavior (Li et al., 2019).

Influences of momentary self-compassion on other stress processing variables such as different coping or emotional responses have not been investigated yet.

Thus, the primary aim of the current study was to investigate the within-person effects of momentary self-compassion with respect to stress processing and affective well-being. We derived the following hypotheses: (a) Higher momentary self-compassion is related to perceiving lower amounts of stress, (b) Higher momentary self-compassion is related to higher use of engagement coping and lower use of disengagement coping on a specific occasion. (c) Higher momentary self-compassion is related to more positive affect and less negative affect. (d) Higher momentary levels of stress and disengagement coping are related to less positive affect and more negative affect, while more engagement coping is associated with more positive and less negative affect. (e) Momentary levels of stress and coping strategies mediate the relation between momentary self-compassion and momentary affective well-being.

To test these hypotheses, we used an ambulatory assessment approach, which permits to study the dynamic links between psychological sensations over time (Todd et al., 2004). To overcome retrospective influences that one-time daily diary studies still have, we collected data on state measures of self-compassion, perceived stress, engagement, and disengagement coping, and affective well-being three times a day. We additionally explored whether we could find some evidence for our hypotheses even when investigating lagged associations, for example, how momentary self-compassion in the afternoon is associated with coping responses and affect measured in the evening.

Methods

Participants

Participants were recruited via the participant pool of cognitive sciences at an urban university in Germany and via class announcements. Additionally, flyers were placed at urban

meditation centers, yoga schools, fitness studios, supermarkets, and the university campus. In total, 222 participants were recruited. Nine had to be excluded from all data analyses for two reasons: five had technical problems, and four did not participate in the experience sampling. This resulted in 213 participants being included in the final data analysis. The completion rate of the ambulatory assessment measures was over 92% on average in the present study and can be judged as ‘satisfactory’ (Shiffman, Stone, & Hufford, 2008). Of all records, 3102 (71.3%) were entered on a weekday (vs. weekend), and the daytime was nearly equally distributed across time points (morning, afternoon, evening). Participants’ mean age was 23.35 (SD = 5.57, range = 18 – 59). Among them, 183 (85.9%) classified as female. In addition, 204 (95.7%) of the final participant sample were students, and 129 (60.56%) of them studied psychology. Employees were only 2.3% (N = 5) of the total sample. Four (1.9 %) were self-employed, unemployed, or other.

Procedure

The study was advertised as a one-week ambulatory assessment study using the participants’ smartphones to investigate the relations between personality, perceived stress, and affective well-being. After the first contact via an email expressing interest, a research assistant invited participants in groups of up to six to the lab. During an introductory session, participants were instructed to install the ambulatory assessment app ‘movisensXS’ on their smartphones (movisens GmbH. (2019). movisensXS [software]. <https://www.movisens.com/de/produkte/movisensxs/>). They additionally completed a baseline questionnaire that included demographic information and further measures. Self-compassion, perceived stress, coping, and affect were assessed in the ambulatory assessment part of the study. The ambulatory assessment study used a time-based protocol with random interval schedules. Participants were prompted acoustically three times a day (morning: 10 a.m. to 2 p.m., afternoon: 2 p.m. to 6 p.m., and evening: 6 p.m. to 10 p.m.) to answer the daily ambulatory assessment questions. These questionnaires were identical each day. These

assessments were collected for the following seven days. If participants did not answer the prompt within 15 min, the response window was closed to prevent backfilling of data (and the data point was treated as missing). In return for participation, students could receive either study participation credit or payment after completing 70% of the questions, worth approximately US \$25. All participants gave their informed consent prior to the participation.

Measures

Momentary Self-Compassion

Self-compassion was measured with the short German version of the Self-Compassion Scale (SCS-D; Hupfeld & Ruffieux, 2011; Neff, 2003a) for which we adapted the introduction text to form a Daily Self-Compassion Scale (DSCS). The instructions were shortened to ‘In this moment...’. The wording of some items was adapted to make them suitable to refer to the current moment rather than to the typical stance towards oneself in difficult times. The scale consists of all of the 12 items of the original short German version of the SCS-D, including all six subscales consisting of two items for each scale: Self-kindness (e.g., “...I try to be understanding and patient towards those aspects of my personality I don’t like”), self-judgment, (e.g., “...I am disapproving and judgmental about my flaws and inadequacies”), common humanity (e.g., “...I try to see my failings as part of the human condition”), isolation (e.g., “...I think that other people are happier than I am.”), mindfulness (e.g., “...I try to take a balanced view of the situation”), and over-identification (e.g., “...I get carried away with my feelings”). Using a scale from 1 (not at all) to 5 (very much), higher scores indicated higher momentary self-compassion. To compute the total score, a grand mean was computed from the six subscale means.

Perceived Stress

Participants completed a single-item measure of perceived stress, namely: “How much stress are you experiencing at this moment?” This was rated on a rating scale from 0 (not at all) to 100 (extremely stressed) scale. One-item visual analog scales are routinely used in

psychological research to assess momentary perceived stress (e.g., Arch et al., 2014; Kimura et al., 2007) and have been validated (Kim et al., 2008).

Coping

Participants completed relevant subscales of the German version of the Brief COPE inventory (Carver, 1997; Knoll et al., 2005) to assess daily used coping strategies. Participants were asked how they had dealt with stressful and difficult situations since the last assessment or since waking up (for the first beep of the day). The rationale for the selection of coping subscales was to include both engagement and disengagement coping strategies according to the classical coping literature which have been shown to be robustly related to self-compassion (cf. Ewert et al., 2021) while keeping participants' burden in terms of scale length at a minimum because of the ambulatory assessment design. Thus, five subscales were selected: denial (e.g., "I've been refusing to believe that it has happened"), behavioral disengagement (e.g., "I've been giving up the attempt to cope.") (disengagement forms of coping); active coping (e.g., "I've been concentrating my efforts on doing something about the situation I'm in"), acceptance (e.g., "I've been learning to live with it"), and positive reinterpretation (e.g., "I've been looking for something good in what is happening") (engagement forms of coping). Items were rated on a four-point Likert scale from (1) not at all to (4) very much. To create composite scores for the two variables, engagement coping and disengagement coping, the means of the respective subscales were averaged.

Affect

Positive (PA) and negative affect (NA) were assessed with six mood adjectives representing the structure of affect (Blanke & Brose, 2017). Three items were used to assess PA (happy, relaxed, and content) and three to measure NA (nervous, downhearted, and distressed). The items were introduced with the following phrase: "How did you feel since the last assessment or since waking up (for the first beep of the day): Please rate how well the following emotion adjectives describe your feelings during this time period." The scale ranged from 0 (does not

apply at all) to 6 (applies strongly). Consistent with previous research (Blanke & Brose, 2017), for both scales, the mean score of the respective items was used for data analysis.

Data Analyses

Given the hierarchical structure of our data, a multilevel modeling approach (Raudenbush & Bryk, 2002) was chosen. With multilevel modeling, the variance of Level 1 variables (occasion level) can be decomposed into within- and between-person components and thus account for the possibility that relations between variables might vary between the within-person level versus the between-person level. The relative amount of variance in study variables lying between and within-persons was explored by inspecting the ICCs based on a random coefficient model (Bolger & Laurenceau, 2013). Between- and within-person reliability coefficients (i.e., Cronbach's alpha) were calculated for all these measures according to the recommendations of (Geldhof et al., 2014). For evaluating within-person reliability of the scales, we followed Nezlek (2017), who proposed that within-person reliability estimates of a scale that are somewhat lower than between-persons estimates that one might apply for trait measures might still be acceptable. This is due to the fact that contemporary multi-level modelling programs take unreliability into account more fully than traditional analyses such as multiple regression.

To test our hypotheses, Multilevel Structural Equation Modelling (MSEM) was used with the program Mplus (Muthén & Muthén, 2017) following Preacher and colleagues' recommendations for testing multilevel mediation models (Preacher et al., 2011). We used the 1-1-1 design with predictor, mediators and outcome variables at level 1, and adapted it for the three parallel mediators perceived stress, engagement coping, and disengagement coping. In the two main models testing our hypotheses, the independent variable was self-compassion, the dependent variable was either positive affect or negative affect. We tested if the relations between self-compassion and affective well-being are mediated by perceived stress, engagement and disengagement coping on the within- and the between-person levels (see also

Figure 1). For that, we calculated the indirect effects of momentary self-compassion on positive affect or negative affect via perceived stress, engagement coping, and disengagement coping on both levels. Due to the potential nonnormality of the underlying indirect effects' distributions, 95% Monte Carlo confidence intervals were calculated to evaluate their significance (Preacher & Selig, 2012). Effects will be considered as significant, if the confidence intervals do not include the value of zero. In addition, we performed two alternative 1-1-1 models, which included self-compassion and perceived stress at one time point prior (TimeX minus one) the other state measures. This approach was chosen because the instruction asked participants to report self-compassion and perceived stress for the present moment whereas coping and affect should be reported for the time period since the last beep. In addition, this enabled us to analyze, for example, how momentary self-compassion and perceived stress assessed in the morning are related to coping responses and either positive affect or negative affect measured in the afternoon.

Data Availability Statement: All data are available at the Open Science Framework (https://osf.io/z37hc/?view_only=aa673417e17b43509dd07e29b5254bfe).

Results

Preliminary Analyses

Descriptive statistics (mean, SD), intra-class correlations (ICC), reliabilities (Cronbach's alphas) for both levels, as well as both between and within variance for all variables, are presented in Table 1. Momentary self-compassion showed an ICC of .496, indicating that around half of the variance in self-compassion was a between-person variation, while the other half represented variation within persons. This confirmed that self-compassion could be conceptualized as a trait as well as a state construct and that it could be worthwhile to have a closer look into both levels. ICCs of the other variables ranged from .287 (perceived stress) to .519 (engagement coping). As illustrated in Table 1, the correlations between self-compassion, perceived stress, engagement and disengagement coping, as well as positive and

negative affect at the within- and between-person level were in the expected directions. The reliability on both levels can be judged acceptable to substantial (see Table 1).

Multilevel Mediation Analyses

In total, four 1-1-1 models were tested to examine the indirect effects of momentary self-compassion on positive and negative affect via perceived stress, engagement, and disengagement coping at the between- and within-person levels. Two models were calculated either with positive affect or with negative affect as the dependent variable. In the two alternative models, self-compassion and perceived stress at one time point prior were included. The effect estimates of all four models are presented in Table 2 and Table 3. For the two models in which positive affect was the dependent variable, all estimates of within paths (e.g., the random slope effect for momentary self-compassion on perceived stress or the effect of perceived stress on positive affect) turned out to be significant (see Table 2). The 95% confidence intervals of the within-person random slopes did not contain zero. Higher momentary self-compassion showed a significant effect on all three mediators (less perceived stress, higher levels of engagement, and lower levels of disengagement coping). In addition, self-compassion at t-1 was significantly related to perceived stress at t-1, engagement, and disengagement coping. Perceived stress (and perceived stress at t-1), engagement coping, and disengagement coping were significantly related to positive affect in the expected direction in both models.

In the two models in which negative affect was the dependent variable, we found a comparable pattern of results, with two exceptions: The estimates of within random slope effects for engagement coping on negative affect in the original model and for self-compassion at t-1 on disengagement coping in the alternative model pointed in the expected direction but turned out to be nonsignificant (see Table 3).

The indirect effects of self-compassion on positive affect on the within-person level turned out as expected. Self-compassion had a positive indirect effect on positive affect

through lower perceived stress ($B = 0.243, p < .001, SE = 0.028, 95\%-CI = [0.19; 0.30]$) and lower disengagement coping ($B = 0.061, p < .001, SE = 0.014, 95\%-CI = [0.04; 0.09]$) as well as through higher engagement coping ($B = 0.058, p < .001, SE = 0.013, 95\%-CI = [0.03; 0.08]$). In the alternative model, the indirect effects of momentary self-compassion at t-1 on positive affect through decreased perceived stress at t-1 ($B = 0.053, p < .05, SE = 0.026, 95\%-CI = [0.00; 0.11]$) and through decreased disengagement coping ($B = 0.042, p < .05, SE = 0.017, 95\%-CI = [0.01; 0.08]$) were also significant, while the indirect effect through increased engagement coping ($B = 0.052, p = .147, SE = 0.036, 95\%-CI = [-0.02; 0.12]$) was nonsignificant.

The indirect effects for the two models predicting negative affect showed a similar picture. Momentary self-compassion demonstrated a negative indirect effect on negative affect through lower perceived stress ($B = -0.174, p < .001, SE = 0.020, 95\%-CI = [-0.21; -0.13]$) and less disengagement coping ($B = -0.080, p < .001, SE = 0.013, 95\%-CI = [-0.10; -0.06]$). The indirect effect through increased engagement coping was in the expected negative direction but nonsignificant ($B = -0.019, p = .085, SE = 0.011, 95\%-CI = [-0.04; 0.00]$). In the alternative model, the indirect effect of momentary self-compassion at t-1 on negative affect through decreased perceived stress at t-1 pointed in the expected direction ($B = -0.042, p = .071, SE = 0.023, 95\%-CI = [-0.09; -0.00]$), but just missed the conventional significance level. The indirect effects through engagement coping ($B = -0.025, p = .126, SE = 0.017, 95\%-CI = [-0.06; 0.01]$) and through disengagement coping ($B = -0.043, p = .153, SE = 0.030, 95\%-CI = [-0.10; 0.02]$) were nonsignificant.

Due to our focus on within-level effects, we only presented the between-level estimates for all four models in the supplementary materials at Open Science Framework. With one exception for the relation between self-compassion and engagement coping, all estimates turned out to be nonsignificant (see Table S1, S2, and S3 in Appendix A in the

supplementary materials,

https://osf.io/z37hc/?view_only=aa673417e17b43509dd07e29b5254bfe).

Discussion

Our ambulatory assessment study focused on self-compassion as a state and on how it explains within-person variation in stress, coping, and affective well-being. The results revealed that around one-half of the variance of self-compassion was at the within-person level, which supported that the levels of momentary self-compassion in a given person do considerably fluctuate across different occasions. Thus, in line with past research (Breines et al., 2013; Kelly & Stephen, 2016, Li et al., 2019) our study showed that self-compassion has a substantial state component.

The within-person level results from this study were in line with our hypotheses: On occasions when individuals treated themselves more self-compassionately, they experienced less stress, reported more engagement and less disengagement coping, and experienced higher affective well-being in terms of more positive and less negative affect. Moreover, momentary stress perception and the use of healthier coping were associated with affective well-being on specific occasions as expected. Accordingly, our mediational hypothesis was also confirmed at the within-person level (with one exception for the pathway from self-compassion on negative affect via engagement coping on): When experiencing higher momentary self-compassion, individuals tend to perceive less momentary stress, engage in healthier coping, and in turn, experience more positive emotional states. This result at the within-level is in line with empirical evidence about the beneficial role of trait self-compassion on stress processing and affective well-being (cf., Ewert et al., in preparation; Sirois et al., 2015; Zessin et al. 2015) and with theoretical assumptions: Referring to Lazarus and Folkman's (1984) stress theory, protective traits are related to emotional states in dealing with stressful events in a functional way. Self-compassion has often been considered such a protective trait in past research. Beyond that, we expected that these protective effects can also be found at the

intraindividual level, especially due to the high within-person variation of self-compassion, which was found over different occasions. Indeed, our results suggest that also state components of self-compassion are beneficial for mental and physical health by maintaining self-regulation resources (Terry & Leary, 2011) and thus, might lead to greater distress tolerance on specific occasions (Webb & Forman, 2013).

The associations between momentary self-compassion and momentary perceived stress, coping, and affective well-being were also found when self-compassion on the time point prior to the other variables was included in the model. However, there were two exceptions in the model with negative affect as the dependent variable where the association of momentary self-compassion and less disengagement coping on the next occasion as well as the association of engagement coping and negative affect were no longer significant. Considering the assumed mediational pathway, only the links between momentary self-compassion and positive affect via perceived stress and disengagement coping could be replicated when self-compassion one occasion prior to coping and affective well-being was included in the respective models. Thus, it can be summarized that the effects among lagged associations were less robust. Although all effects were in the expected direction, most just missed the conventional level of significance. Nevertheless, our findings are also in accordance with Gilbert's general assumption (Gilbert, 2005) that treating oneself with more self-compassion stimulates feelings of safeness and security and, therefore, prevents from experiencing harm and distress. Thus, when individuals experience higher momentary self-compassion, they may be able to perceive stressful events in a more calm and accepting way. This may, in turn, prevent individuals from experiencing negative feelings and facilitate positive emotions.

Although it was not the focus of this work, it should be mentioned that almost all results on the between-person-level turned out to be nonsignificant in our study which seems to contradict former findings on effects of trait self-compassion on stress processing (Arch et

al., 2014; Ewert et al., 2018; Sirois et al., 2014). However, one has to consider that momentary self-compassion averaged over situations measured across one week might differ meaningfully from what is measured using a self-report scale assessing self-compassion as a trait (e.g., with respect to the time frame and the diversity of situations considered when responding to the measures). Furthermore, our sample size on the between-person level was rather small to detect indirect effects (Fritz & Mackinnon, 2007).

Limitations and future research

Some limitations need to be mentioned. First, we recruited a rather homogeneous sample consisting mostly of young, highly educated, Caucasian, and female individuals. Due to differences in stress regulation and well-being, the links between self-compassion, stress processing, and affective well-being might vary between Western and Eastern cultures or over the life span (Bowling, 2011; Oyserman et al., 2002). Thus, more studies are needed to replicate the results with more diverse samples including participants from different cultural backgrounds and older adults to shed light on the generalizability of our results. Moreover, it would also be interesting to compare clinical, subclinical, and non-clinical samples in future studies at the within-person level. Intraindividual variations in self-compassion and other mental health variables might differ substantially between these groups and, therefore, could reveal different relations among these concepts.

Second, to reduce participants' burden in our ambulatory assessment design with three measurements per day, we had to cut down the number of items per construct. Our measure of perceived stress consisted of only one item. Although it is face valid, longer measures would be preferable in future research to picture a broader measure of stress appraisal. In addition to that, we were only able to include very few coping strategies. It might be that other coping strategies with higher and more consistent associations to self-compassion (e.g., planning, rumination, and worry; Ewert et al., 2021; Fresnics & Borders, 2016) would show a clearer mediational role in the relation between momentary self-compassion and negative affect.

To get a clearer picture of the role of the different coping strategies in the process, we ran additional multilevel mediation models in which we separately included the different coping strategies as mediators instead of using aggregated scores for engagement and disengagement coping. The results showed that among the engagement coping responses, positive reframing turned out to be a predominant mediator in the relation between an individual's momentary self-compassion and affect, while other effects often were nonsignificant (for more information see Appendix A, Tables S12, S13, S14 & S15). However, as each coping strategy was only measured with two items, thus reducing reliability and validity for the measures of individual coping strategies, further research is needed to untangle underlying coping mechanisms in more detail.

Third, there has been an ongoing controversy about the construct of self-compassion and its measurement. In particular, it has been discussed whether negative and positive items should be combined into one total score (e.g., López et al., 2015; Muris & Petrocchi, 2017) given the risk of conflating positive and negative aspects of self-compassion and inflating relations with mental health outcomes (e.g., Körner et al., 2015; Muris & Petrocchi, 2017). Thus, our results might be driven by the negative subscales in particular. However, a recent transnational examination of the factor structure of the scale supported the use of either the six subscale scores or an overall self-compassion score, but not two separate scores representing compassionate and uncompassionate self-responding (Neff et al., 2019). Future studies using the full scale should focus more on the sub-facets of self-compassion and their relations with daily life outcomes. Nevertheless, taking this ongoing debate into account, we additionally calculated correlations between all self-compassion subscales, compassionate as well as uncompassionate self-responding, and all variables at both levels. We provided the results in the supplementary materials (for more information see Appendix A, Table S17).

Another point to mention is that we relied exclusively on self-report measures. Past research has indicated that even a brief self-compassion training can reduce not only

subjective anxiety responses but also physiological responses such as heart rate variability or salivary alpha-amylase to a stressful situation (Arch et al., 2014). In future research, it would be interesting to include physiological indicators of stress processing such as sympathetic or parasympathetic activity or peer-reports of coping behavior in addition to assessing self-reported variables that rely on more subjective perceptions of stress and coping.

In addition, the state version of the scale we used to measure self-compassion might deviate too much from the original scale by Neff (2003a). To adapt the scale to the momentary context, we omitted the reference to “difficult times” that is included in the original instruction. This might alter the construct of self-compassion to be a healthy attitude towards oneself at any moment. Fortunately, our dataset allowed us to deal with this concern by only including occasions for which participants reported that they felt stressed in that particular moment. We ran additional multilevel mediation models for this reduced data set and provided the results in the supplementary materials. The results were comparable to those reported for the full data set (see Appendix A, Tables S6 and S7). This indicates that changes in the validity of the scale (if any) had little effect on the general pattern of results reported here. Nevertheless, further research on within effects of self-compassion should consider using the recently published validated state version of the scale (Neff et al., 2021).

Another methodological issue should be mentioned referring to the instruction used for assessing the stress variable. While participants were asked to report perceived stress ‘at this moment’, they were asked to report coping responses and affect ‘since the last assessment’. Due to that difference, we initially decided to implement not only self-compassion but also perceived stress at $t-1$ in the two alternative models we investigated exploratively to portray the assumed stress process and lagged associations in more detail. However, participants might not respond differently to instructions including ‘at the moment’ versus ‘since the last assessment’ as time frames. In addition, we also provided model results in which we only implemented self-compassion at the $t-1$ level (and stress and coping

responses at t) in the supplementary materials (for more information see Appendix A, Tables S4 and S5). Nevertheless, future research is needed to explore the lagged associations between momentary self-compassion, stress processing, and affective well-being. Moreover, future research may also want to investigate the factors that influence the fluctuations in momentary self-compassion on specific occasions. Situational factors, such as the occurrence of challenging events, and individual differences in accessing tools that facilitate an individual's momentary self-compassion, such as experiences with meditation or brief self-compassion exercises might be promising candidates to be explored in future studies.

Due to our correlative design, our results should finally be interpreted with caution in terms of causality. Thus, future research could examine the causal relation at the within-person level in experience-sampling ambulatory assessment designs that include experimental elements. For example, one-minute short-term interventions such as compassion-focused imagery versus control imagery exercises (e.g., Rockliff et al., 2008) could be prompted randomly in an app right after an individual reports a stressor. This experimental manipulation of self-compassion could then be followed by relevant state measures to assess the dependent variables (e.g., perceived stress, coping, and affect). After all, also other directions of relations such as leading from coping or from affect to different momentary self-compassionate states could be possible and could be investigated in further research integrating other theoretical rationals.

Last but not least, to derive practical implications, our findings from the within-person level suggest that not only intervention programs that target to increase trait self-compassion but also brief interventions that increase momentary self-compassion might be able to minimize perceived stress and improve coping behavior in specific situations, instantly leading to better emotional states especially in comparison to situations in which this person did not engage in self-compassion. Such knowledge is needed to guide the development of effective and efficient brief interventions to enhance healthier stress processing and affective

well-being. Intervention programs that help to improve trait self-compassion have been extensively explored and are widely recognized for their effectiveness (for a review, see Wilson et al., 2019). However, participating in such programs requires a significant amount of time and training to rise individual's ability for self-compassion sustainably. Perhaps some exercises in these programs could be adapted to be applied briefly and could then be used to increase momentary levels of self-compassion on a given occasion when needed. Future studies could investigate the efficiency of these brief exercises in improving momentary self-compassion.

Declarations

Acknowledgments: T

The authors would like to thank Anabel Buechner and Rosanna Wendel for their help in collecting the data. Additionally, we want to thank Jan Krause for his help preparing the data for final analyses.

Author Contributions:

CE: designed the study, did the literature search, provided the data analyses and wrote the paper; CH: collaborated with the design, assisted with collecting the data and writing of the study, assisted with the literature search and data analyses; MSA: assisted in designing the study and data analyses, collaborated in writing of the manuscript. All authors approved the final version of the manuscript for submission.

Funding Information:

This study was funded by a scholarship from the Potsdam Graduate School to the first author.

Compliance with Ethical Standards

Conflict of Interest:

The authors declare that they have no conflict of interest.

Ethical Approval:

All procedures performed in the current study involving human participants were in accordance with the ethical standards of the University of Potsdam. The procedures used in this study also adhere to the tenets of the Declaration of Helsinki.

Informed consent:

Informed consent was obtained from all participants prior data collection of the study.

References

- Adams, C. E., & Leary, M. R. (2007). Promoting self-compassion toward eating among restrictive and guilty eaters. *Journal of Social and Clinical Psychology, 10*(10), 1120–1144. <https://doi.org/10.1521/jscp.2007.26.10.1120>
- Allen, A. B., & Leary, M. R. (2010). Self-compassion, stress, and coping. *Social and Personality Psychology Compass, 4*(2), 107–118. <https://doi.org/10.1111/j.1751-9004.2009.00246.x>
- Arch, J. J., Brown, K. W., Dean, D. J., Landy, L. N., Brown, K. D., & Laudenslager, M. L. (2014). Self-compassion training modulates alpha-amylase, heart rate variability, and subjective responses to social evaluative threat in women. *Psychoneuroendocrinology, 42*, 49–58. <https://doi.org/10.1016/j.psychoneu.2013.12.018>
- Blanke, E. S., & Brose, A. (2017). Mindfulness in daily life: A multidimensional approach. *Mindfulness, 8*(3), 737–750. <https://doi.org/10.1007/s12671-016-0651-4>
- Breines et al., J. G., & Chen, S. (2013). Activating the inner caregiver: The role of supporting schemas in increasing state self-compassion. *Journal of Experimental Social Psychology, 49* (1), 58–64. <https://doi.org/10.1016/j.jesp.2012.07.015>

- Brion, J. M., Leary, M. R., & Drabkin, A. S. (2014). Self-compassion and reactions to serious illness: The case of HIV. *Journal of Health Psychology, 19*(2), 218–229.
<https://doi.org/10.1177/1359105312467391>
- Bolger, N., & Laurenceau, J.P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. Guilford Press.
<https://psycnet.apa.org/record/2012-17340-000>
- Bowling, A. (2011). Do older and younger people differ in their reported well-being? A national survey of adults in Britain. *Family Practice, 28*(2), 145–155.
<https://doi.org/10.1093/fampra/cmq082>
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the brief cope. *International Journal of Behavioral Medicine, 4*(1), 92–100.
https://doi.org/10.1207/s15327558ijbm0401_6
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267–283. <https://doi.org/10.1037/0022-3514.56.2.267>
- Carver, C. S., & Connor-Smith, J. (2010). Personality and Coping. *Annual Review of Psychology, 61*(1), 679–704. <https://doi.org/10.1146/annurev.psych.093008.100352>
- Chishima, Y., Mizuno, M., Sugawara, D., & Miyagawa, Y. (2018). The influence of self-compassion on cognitive appraisals and coping with stressful events. *Mindfulness, 9*(6), 1907–1915. <https://doi.org/10.1007/s12671-018-0933-0>
- Connor-Smith, J. K., Compas, B. E., Wadsworth, M. E., Thomsen, A. H., & Saltzman, H. (2000). Responses to stress in adolescence: Measurement of coping and involuntary stress responses. *Journal of Consulting and Clinical Psychology, 68*(6), 976–992.
<https://doi.org/10.1037//0022-006X.68.6.976>

- Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology*, *93*(6), 1080–1107. <https://doi.org/10.1037/0022-3514.93.6.1080>
- Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin*, *143*(9), 939–991. <https://doi.org/10.1037/bul0000110>
- Diedrich, A., Burger, J., Kirchner, M., & Berking, M. (2016). Adaptive emotion regulation mediates the relationship between self-compassion and depression in individuals with unipolar depression. *Psychology and Psychotherapy*. *90*(3), 247–263. <https://doi.org/10.1111/papt.12107>
- Dupasquier, J. R., Kelly, A. C., Waring, S. V., & Moscovitch, D. A. (2020). Self-compassionate college women report receiving more social support in the face of distress: Evidence from a daily diary study. *Personality and Individual Differences*, *154*(6), 109680. <https://doi.org/10.1016/j.paid.2019.109680>
- Ewert, C., Gaube, B., & Geisler, F. C. M. (2018). Dispositional self-compassion impacts immediate and delayed reactions to social evaluation. *Personality and Individual Differences*, *125*, 91–96. <https://doi.org/10.1016/j.paid.2017.12.037>
- Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness*, *12*(5), 1063–1077. <https://doi.org/10.1007/s12671-020-01563-8>
- Ewert, C., Büchner, A., & Schröder-Abé, M. (2022). *The mediating role of stress processing in the relation of self-compassion and affective well-being: Evidence from two longitudinal studies*. Manuscript in preparation.
- Fleeson, W., & Jayawickreme, E. (2015). Whole trait theory. *Journal of Research in Personality*, *56*, 82–92. <https://doi.org/10.1016/j.jrp.2014.10.009>

- Fournier, M. A., & Moskowitz, D. S. (2018). Cross-situational consistency, variability and the behavioral signature. In V. Zeigler-Hill, & T. K. Shackelford (Eds.). *The SAGE handbook of personality and individual differences: Origins of personality and individual differences* (pp. 218–240). Sage Reference.
<https://doi.org/10.4135/9781526451200.n13>.
- Fresnics, A., & Borders, A. (2016). Angry rumination mediates the unique associations between self-compassion and anger and aggression. *Mindfulness*, *50*(7), 554-564.
<https://doi.org/10.1007/s12671-016-0629-2>
- Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, *18*(3), 233–239. <https://doi.org/10.1111/j.1467-9280.2007.01882.x>
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, *19*(1), 72–91.
<https://doi.org/10.1037/a0032138>
- Gilbert. (2005). Compassion: Conceptualisations, research and use in psychotherapy: Focused therapies and compassionate mind training for shame and self-attacking. In Paul Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy* (pp. 263–325). Brunner-Routledge.
- Gillanders, D. T., Sinclair, A. K., MacLean, M., & Jardine, K. (2015). Illness cognitions, cognitive fusion, avoidance and self-compassion as predictors of distress and quality of life in a heterogeneous sample of adults, after cancer. *Journal of Contextual Behavioral Science*, *4*(4), 300–311. <https://doi.org/10.1016/j.jcbs.2015.07.003>
- Hiraoka, R., Meyer, E. C., Kimbrel, N. A., DeBeer, B. B., Gulliver, S. B., & Morissette, S. B. (2015). Self-compassion as a prospective predictor of PTSD symptom severity among trauma-exposed U.S. Iraq and afghanistan war veterans. *Journal of Traumatic Stress*, *28*(2), 127–133. <https://doi.org/10.1002/jts.21995>

- Homan, K. J., & Sirois, F. M. (2017). Self-compassion and physical health: Exploring the roles of perceived stress and health-promoting behaviors. *Health Psychology Open*, 4(2), Article 2055102917729542. <https://doi.org/10.1177/2055102917729542>
- Hupfeld, J., & Ruffieux, N. (2011). Validierung einer deutschen Version der Self-Compassion Scale (SCS-D) [Validation of the German Self-compassion Scale (SCS-D)]. *Zeitschrift für Klinische Psychologie und Psychotherapie*, 40(2), 115–123. <https://doi.org/10.1026/1616-3443/a000088>
- Kelly, A. C., & Carter, J. C. (2015). Self-compassion training for binge eating disorder: A pilot randomized controlled trial. *Psychology and Psychotherapy*, 88(3), 285–303. <https://doi.org/10.1111/papt.12044>
- Kim, D., Bae, H., & Chon Park, Y. (2008). Validity of the subjective units of disturbance scale in EMDR. *Journal of EMDR Practice and Research*, 2(1), 57–62. <https://doi.org/10.1891/1933-3196.2.1.57>
- Kimura, K., Ozeki, M., Juneja, L. R., & Ohira, H. (2007). L-theanine reduces psychological and physiological stress responses. *Biological Psychology*, 74(1), 39–45. <https://doi.org/10.1016/j.biopsycho.2006.06.006>
- Knoll, N., Rieckmann, N., & Schwarzer, R. (2005). Coping as a mediator between personality and stress outcomes: a longitudinal study with cataract surgery patients. *European Journal of Personality*, 19(3), 229–247. <https://doi.org/10.1002/per.546>
- Körner, A., Coroiu, A., Copeland, L., Gomez-Garibello, C., Albani, C., Zenger, M., & Brähler, E. (2015). The Role of Self-Compassion in Buffering Symptoms of Depression in the General Population. *PloS One*, 10(10), e0136598. <https://doi.org/10.1371/journal.pone.0136598>
- Krieger, T., Altenstein, D., Baettig, I., Doerig, N., & Holtforth, M. G. (2013). Self-compassion in depression: Associations with depressive symptoms, rumination, and

- avoidance in depressed outpatients. *Behavior Therapy*, *44*(3), 501–513.
<https://doi.org/10.1016/j.beth.2013.04.004>
- Krieger, T., Berger, T., & Holtforth, M. G. (2016). The relationship of self-compassion and depression: Cross-lagged panel analyses in depressed patients after outpatient therapy. *Journal of Affective Disorders*, *202*, 39–45. <https://doi.org/10.1016/j.jad.2016.05.032>
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw-Hill.
<https://psycnet.apa.org/record/1966-35050-000>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company. https://books.google.de/books/about/Stress_Appraisal_and_Coping.html?id=i-ySQQuUpr8C&redir_esc=y
- Lazarus, R. S., & Folkman, S. (1986). Cognitive theories of stress and the issue of circularity. In M.H. Appley, R. Trumbull (Eds.) *Dynamics of Stress. The Plenum Series on Stress and Coping* (pp. 63–80). Springer. http://dx.doi.org/10.1007/978-1-4684-5122-1_4
- Li, Y., Deng, J., Lou, X., Wang, H., & Wang, Y. (2020). A daily diary study of the relationships among daily self-compassion, perceived stress and health-promoting behaviours. *International Journal of Psychology: Journal International De Psychologie*, *55*(3), 364–372. <https://doi.org/10.1002/ijop.12610>
- López, A., Sanderman, R., Smink, A., Zhang, Y., van Sonderen, E., Ranchor, A., & Schroevers, M. J. (2015). A Reconsideration of the Self-Compassion Scale's Total Score: Self-Compassion versus Self-Criticism. *PloS One*, *10*(7), e0132940.
<https://doi.org/10.1371/journal.pone.0132940>
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, *32*(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>
- Mischel, W. (1968). *Personality and assessment*. Wiley & Sons Inc.

- Moskowitz, D. S., Brown, K. W., & Coté, S. (1997). Reconceptualizing stability: Using time as a psychological dimension. *Current Directions in Psychological Science*(6), 127–132. <https://doi.org/10.1111/1467-8721.ep10772890>
- Moskowitz, D. S., & Fournier, M. A. (2015). The interplay of persons and situations: Retrospect and prospect. In M. Mikulincer, P. R. Shaver, M. L. Cooper, & R. J. Larsen (Eds.), *APA handbook of personality and social psychology: Vol. 4. Personality processes and individual differences* (pp. 471–489). American Psychological Association. <https://doi.org/10.1037/14343-021>
- Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. <https://doi.org/10.1002/cpp.2005>.
- Muthén, L.K. and Muthén, B.O. (2017). *Mplus User's Guide (Eighth Ed.)*. https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf.
- Neff, K. D. (2003a). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223–250. <https://doi.org/10.1080/15298860390209035>
- Neff, K. (2003b). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2, 85–101. <https://doi.org/10.1037/e342422004-001>
- Neff, K. D., & Dahm, K. A. (2015). Self-compassion: What it is, what it does, and how it relates to mindfulness. In B.D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 121–137). Springer. https://doi.org/10.1007/978-1-4939-2263-5_10
- Neff, K. D., Hsieh, Y.-P., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, 4(3), 263–287. <https://doi.org/10.1080/13576500444000317>

- Neff, K. D., Tóth-Király, I., Knox, M. C., Kuchar, A., & Davidson, O. (2021). The Development and Validation of the State Self-Compassion Scale (Long- and Short Form). *Mindfulness*, 12(1), 121–140. <https://doi.org/10.1007/s12671-020-01505-4>
- Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., &... Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment*, 31(1), 27–45. <https://doi.org/10.1037/pas0000629>
- Nezlek, J. B. (2017). A practical guide to understanding reliability in studies of within-person variability. *Journal of Research in Personality*, 69(4), 149–155. <https://doi.org/10.1016/j.jrp.2016.06.020>
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128(1), 3–72. <https://doi.org/10.1037//0033-2909.128.1.3>
- Preacher, K. J., & Selig, J. P. (2012). Advantages of monte carlo confidence intervals for indirect effects. *Communication Methods and Measures*, 6(2), 77–98. <https://doi.org/10.1080/19312458.2012.679848>
- Preacher, K. J., Zhang, Z., & Zyphur, M. J. (2011). Alternative methods for assessing mediation in multilevel data: The advantages of multilevel sem. *Structural Equation Modeling: A Multidisciplinary Journal*, 18(2), 161–182. <https://doi.org/10.1080/10705511.2011.557329>
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications. <https://searchworks.stanford.edu/view/10008101>
- Rockliff, H., Gilbert, P., McEvan Kristen, Lightman, S., & Glover, D. (2008). A pilot exploration of heart rate variability and salivary cortisol responses to compassion-focused imagery. *Clinical Neuropsychiatry*, 5(3), 132–139. <https://doi.org/10.1037/t10178-000>

- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2014). Self-compassion, stress, and coping in the context of chronic illness. *Self and Identity, 14*(3), 334–347.
<https://doi.org/10.1080/15298868.2014.996249>
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: a review and critique of category systems for classifying ways of coping. *Psychological Bulletin, 129*(2), 216–269. <https://doi.org/10.1037/0033-2909.129.2.216>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology - An introduction. *American Psychologist, 55*(1), 5–14. <https://doi.org/10.1037/0003-066X.55.1.5>
- Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology, 4*, 1-32.
<https://doi.org/10.1146/annurev.clinpsy.3.022806.091415>
- Stutts, L. A., Leary, M. R., Zeveney, A. S., & Hufnagle, A. S. (2018). A longitudinal analysis of the relationship between self-compassion and the psychological effects of perceived stress. *Self and Identity, 17*(6), 609–626.
<https://doi.org/10.1080/15298868.2017.1422537>
- Terry, M. L., & Leary, M. R. (2011). Self-compassion, self-regulation, and health. *Self and Identity, 10*(3), 352–362. <https://doi.org/10.1080/15298868.2011.558404>
- Todd, M., Tennen, H., Carney, M. A., Armeli, S., & Affleck, G. (2004). Do we know how we cope? Relating daily coping reports to global and time-limited retrospective assessments. *Journal of Personality and Social Psychology, 86*(2), 310.
<https://doi.org/10.1037/0022-3514.86.2.310>
- Webb, J. B., & Forman, M. J. (2013). Evaluating the indirect effect of self-compassion on binge eating severity through cognitive-affective self-regulatory pathways. *Eating Behaviors, 14*(2), 224–228. <https://doi.org/10.1016/j.eatbeh.2012.12.005>

- Weinstein, N., Brown, K. W., & Ryan, R. M. (2009). A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *Journal of Research in Personality*, 43(3), 374–385. <https://doi.org/10.1016/j.jrp.2008.12.008>
- Wilson, A. C., Mackintosh, K., Power, K., & Chan, S. W. Y. (2019). Effectiveness of self-compassion related therapies: A systematic review and meta-analysis. *Mindfulness*, 10(6), 979–995. <https://doi.org/10.1007/s12671-018-1037-6>
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology. Health and Well-Being*, 7(3), 340–364. <https://doi.org/10.1111/aphw.12051>
- Zuroff, D. C., Clegg, K.-A., Levine, S. L., Hermanto, N., Armstrong, B. F., Haward, B., & Thode, S. (2021). Beyond trait models of self-criticism and self-compassion: Variability over domains and the search for signatures. *Personality and Individual Differences*, 170(4), 110429. <https://doi.org/10.1016/j.paid.2020.110429>

Figure 1

Multilevel structural equation model showing a 1-1-1 multilevel mediation model (A) between daily self-compassion (SC) and affective well-being (AW; i.e. either negative or positive affect) with the three mediators perceived stress (PS), engagement coping (EC), disengagement coping (DC)., $c'w, c'b$ = direct effect; cw, cb = total effect; figures are based on Preacher et al. (2011).

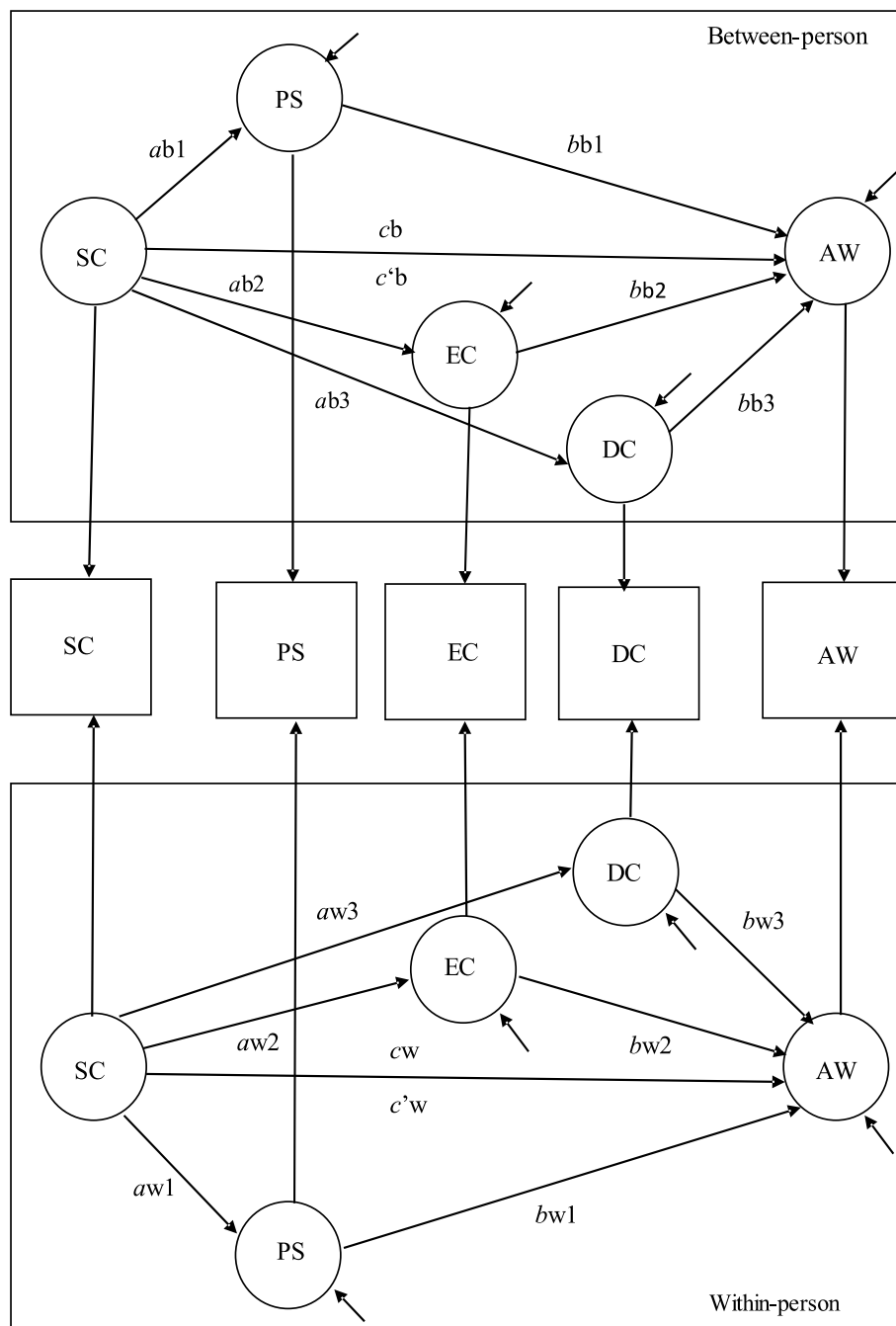


Table 1*Intra-class correlations, reliabilities and correlations between all variables at both levels*

	<i>ICC</i>	<i>M</i>	<i>SD</i>	α_W	α_B	1	2	3	4	5	6	7	8
1 SC	.50	3.53	0.36	.74	.82	—	-.41	.32	-.24	.47	-.48	—	—
2 PS	.29	2.38	4.94	—	—	-.20	—	-.03	.18	-.47	.46	—	—
3 EC	.52	2.39	0.62	.78	.94	.49	.20	—	-.03	.14	-.13	.08	.02
4 DC	.41	1.39	0.26	.52	.89	-.20	.45	.25	—	-.24	.32	-.08	.04
5 PA	.30	3.22	0.93	.83	.90	.57	-.43	.37	-.16	—	-.60	.13	-.11
6 NA	.36	1.78	0.71	.74	.90	-.44	.60	-.02	.59	-.53	—	-.16	.11
7 SC ^{T-1}	.50	3.53	0.36	—	—	—	—	.49	-.21	.60	-.47	—	-.41
8 PS ^{T-1}	.29	2.41	4.94	—	—	—	—	.19	.46	-.48	.64	-.21	—

Note. SC = Self-Compassion, PS = Perceived Stress, EC = Engagement Coping, DC = Disengagement Coping, PA = Positive Affect, Negative Affect = NA; ICC = Intraclass-correlation, α_W = Within-person reliability, α_B = Between-person reliability. Within-person correlations are above the diagonal and between-person correlations are below the diagonal. T-1 indicates the values where we substituted the time 2 with time 1 as well as time 3 with time 2.

Table 2

Estimates of the within-person random slope effects of multilevel mediation models predicting positive affect

	B	SE	95%-CI
SC → PS	-1.727***	0.109	[-1.94; -1.51]
PS → PA	-0.144***	0.009	[-0.16; -0.13]
SC → EC	0.419***	0.030	[0.36; 0.48]
EC → PA	0.088**	0.026	[0.04; 0.14]
SC → DC	-0.205***	0.021	[-0.25; -0.16]
DC → PA	-0.219***	0.040	[-0.30; -0.14]
SC → PA	0.538***	0.039	[0.46; 0.62]
SC ^{T-1} → PS ^{T-1}	-1.689***	0.108	[-1.90; -1.48]
ST ^{T-1} → PA	-0.028***	0.012	[-0.05; -0.05]
SC ^{T-1} → EC	0.110***	0.031	[0.05; 0.17]
EC → PA	0.161*	0.063	[0.04; 0.41]
SC ^{T-1} → DC	-0.068***	0.019	[-0.11; -0.03]
DC → PA	-0.445***	0.057	[-0.56; -0.33]
SC ^{T-1} → PA	0.129***	0.043	[0.05; 0.21]

Note. SC = self-compassion. PS = perceived stress. PA = positive affect. EC = engagement

coping. DC = disengagement coping. B = unstandardized regression coefficient. SE =

Standard Error. 95%-CI= lower and upper bounds within a 95% confidence interval. The

superscript T-1 indicates the values where we substituted time 2 with time 1 as well as time 3

with time 2.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3

Estimates of the within-person random slope effects of multilevel mediation models predicting negative affect

	B	SE	95%-CI
SC → PS	-1.727***	0.109	[-1.94; -1.51]
PS → NA	0.106***	0.008	[0.09; 0.12]
SC → EC	0.420***	0.031	[0.36; 0.48]
EC → NA	-0.036	0.022	[-0.08; 0.00]
SC → DC	-0.200***	0.021	[-0.24; -0.16]
DC → NA	0.321***	0.037	[0.25; 0.39]
SC → NA	-0.440***	0.040	[-0.52; -0.36]
SC ^{T-1} → PS ^{T-1}	-1.689***	0.147	[-1.98; -1.40]
PS ^{T-1} → NA	0.020*	0.010	[0.00; 0.04]
SC ^{T-1} → EC	0.110**	0.042	[0.03; 0.19]
EC → NA	-0.191***	0.042	[-0.27; -0.11]
SC ^{T-1} → DC	-0.071	0.037	[-0.14; 0.00]
DC → NA	0.534***	0.059	[0.42; 0.65]
SC ^{T-1} → NA	-0.133***	0.052	[-0.23; -0.03]

Note. SC = self-compassion. PS = perceived stress. NA = positive affect. EC = engagement

coping. DC = disengagement coping. B = unstandardized regression coefficient. SE =

Standard Error. 95%-CI= lower and upper bounds within a 95% confidence interval. T-1

indicates the values where we substituted the time 2 with time 1 as well as time 3 with time 2.

* $p < .05$, ** $p < .01$, *** $p < .001$.

8 General Discussion

The primary aim of this doctoral dissertation was to provide a deeper insight into the relations of SC, stress processing and affective well-being following a multi-method approach. As previous research has shown that stress perception and the way we cope with demanding life events are two key stress processing mechanisms in the link between SC and affective well-being, this PhD thesis focused on investigating these relations. At first, results from three different empirical studies and from a comprehensive meta-analysis of the link between different coping forms and SC were provided, in order to give a clearer picture of the relation between SC and stress perception as well as coping responses. Moreover, the central research goal was to gain more insight into the role of salutary stress processing by investigating the mediating role of stress perception and coping in the link between SC and affective well-being. To shed light on these relations, two longitudinal studies were conducted as well as an ambulatory assessment study examining the mediating role at the intra-individual level in an everyday context.

8.1 A Deeper Understanding of the Relation between SC, Stress Perception, and Coping with Stressful Situations

The first target of this work was to investigate the relation between SC and perceived stress multi-methodically. In line with previous research (e.g., Neff & Pommier, 2013; Sbarra et al., 2012; Sirois et al., 2014), both longitudinal studies supported the assumption that more self-compassionate people perceived less stress a few weeks later. Thus, grounded in the transactional model of stress (Lazarus, 1966), a more self-compassionate attitude might create a mindset in individuals that facilitates perceiving potentially stressful circumstances in a less demanding way.

Due to the high within-person variation of SC, which was investigated in a few previous studies (Breines et al., 2013; Kelly & Stephen, 2016; Li et al., 2019), it was

suggested that the salutary effects on stress perception might also be established at the intra-individual level. Indeed, the results of the present ambulatory assessment study gave further evidence that SC also has a substantial state component and further supported the hypothesis that SC is linked to a more salutary stress perception at the within-person level. Hence, on occasions, in which an individual treated oneself with more SC, he or she perceived less stress at these occasions. These findings are also in accordance with a more general suggestion that more self-compassionate individuals can access a feeling of safety under demanding life circumstances more easily, protecting them from experiencing distress (Gilbert, 2005).

Another purpose of this PhD thesis was to gain a deeper insight into the relation between SC and coping with demanding circumstances. First, the relations between SC and different forms of coping were investigated in a meta-analysis. The results showed that SC was positively associated with overall engagement coping and negatively associated with overall disengagement coping (e.g., Ewert et al., 2018; Gillanders et al., 2015; Sirois et al., 2014).

In addition, referring to the two longitudinal studies, CLPM analyses showed that SC predicted more use of engagement coping a few weeks later in both studies. The assumption that SC predicts disengagement coping responses was only partially supported: In the longitudinal study with the student sample, SC was associated with less disengagement coping over a six-week period. Thus, a more self-compassionate attitude somewhat protects from the usage of dysfunctional coping strategies a few weeks later, such as neglecting the stressful situation or denying the existence of a stressor. However, in the cross-lagged model with the population-based sample, SC showed no significant link with disengagement coping after two months. A reason for this inconsistency could be that only two sub-strategies were implemented to form disengagement coping in the panel study, which, in regards to the findings from the meta-analysis, were less strongly connected with SC in general.

The findings concerning the relations between SC and engagement, as well as disengagement coping responses, could mainly be transferred to the within-person level in our ambulatory assessment study. As expected, on occasions in which individuals were more self-compassionate, they also engaged in more engagement coping and less disengagement coping. Interestingly to portray a rather directional pathway, momentary SC one occasion earlier than the other variables was also taken into account in an alternative analysis, revealing that the relation between SC and disengagement coping was less prominent and, therefore, showed a comparable picture with the longitudinal results. Hence, the results give further evidence that individuals with higher levels of SC appear to have a greater ability to especially activate more functional coping strategies (such as accepting the existence of a stressful situation or setting up a more positive mindset while facing challenging circumstances) for their affective well-being while handling stressful life circumstances (Folkman & Lazarus, 1988; Neff et al., 2005).

To summarize, a more self-compassionate attitude, as well as higher momentary SC states in demanding situations, might indeed work as a personal resource that facilitates dealing with threatening situations in a self-caring way. Instead of getting absorbed by harsh self-criticism or over-identifying with one's own failures, it helps to put one's own shortcomings into a larger human perspective and to engage in balanced awareness while handling challenging emotions.

8.2 The Role of Stress Processing in the Relation of Self-Compassion and Affective Well-Being

One of the central goals of this PhD thesis was to identify psychological processes accountable for the positive link between SC and affective well-being. Grounded in the transactional stress model (Lazarus & Folkman, 1984), this work focused on the role of two key components in stress processing - perceived stress and coping - as mechanisms

underlying the association between SC and affective well-being, with a multi-method approach in three different single studies.

First, to bear in mind the disadvantages previous research might come along with due to their mainly cross-sectional design (Selig & Preacher, 2009), this work explored if perceived stress and coping might function as possible mediators in this relation in two longitudinal studies. Indeed, results showed consistently that the positive association between SC and affective well-being was mediated through stress perception in a student sample as well as in the population-based sample. However, considering engagement as well as disengagement coping responses as potential mediators in the connection between SC and affective well-being, these pathways seemed to be less pronounced. Only in the population-based sample, the mediational pathway through engagement coping pointed in the expected direction. However, disengagement coping did not turn out to be a mediator in both studies. Of course, further research is needed to replicate these results and might give an answer to the inconsistent findings concerning coping responses. One reason for the differences might be that the coping strategies, which were used to assess coping in this work, might be less relevant for the mediational relation between SC and affective well-being. Taking the results from the meta-analyses into account, especially some disengagement coping responses with a less traditional background in terms of the construct coping, such as worry and rumination were highly negatively related to SC (for a review see Ewert et al., 2021). Moreover, they have been found as mediators between the link of SC and affective well-being in previous literature consistently (e.g., Fresnics & Borders, 2016; Raes et al., 2011). However, former research investigating the mediational pathway of SC and the regulation of emotions mainly involved cross-sectional studies. Future research should explore these effects in more longitudinal and experimental designs in different samples as well as in the everyday context.

In line with Lazarus and Folkman's (1984) assumption, traits such as SC are also linked to emotional states in demanding situations in a more salutary way. As already

presented above, approximately one-half of the variance of SC was at the within-person level, which clearly showed that individual levels of SC considerably vary over time. Hence, the assumed mediational pathways were also explored in an ambulatory assessment study at the within-person level. The mediational hypothesis could be supported at the intra-individual level: On occasions when an individual experienced higher levels of SC, he or she perceived less momentary stress and tended to engage in healthier coping responses (i.e., more engagement and less disengagement coping), and thus, helped to experience more positive and less negative affect. Therefore, the results give further evidence that, in particular, state components of SC are substantially helpful for more functional self-regulation (Terry & Leary, 2011) which in turn, could strengthen the ability to tolerate distressing feelings on specific occasions (Webb & Forman, 2013). However, referring to the assumed relations in more detail at the intra-individual level, effects among lagged relations showed a more similar picture compared to the results from the two longitudinal studies in terms of the mediational pathway through coping responses. While all effects turned out to be in the expected way, most just missed the conservative level of significance.

To summarize, mainly a more salutary stress perception appeared to be the most robust mediator in the association between SC and affective well-being over time in all three single studies conducted for this PhD thesis. All in all, these findings are in line with Gilbert's general assumption (Gilbert, 2005) that more self-compassionate individuals may be able to experience demanding situations in a calmer, more accepting and less stressful way preventing them from harmful feelings and facilitating positive emotions right from the onset of a stressful experience, without the need for any further coping responses.

8.3 Strengths, Limitations and Further Research

The main novelty of this PhD thesis is that the research questions have been investigated with a multi-method approach in three different samples. More precisely, all hypotheses were tested in two longitudinal studies over a six-week period (a student sample) and two months

(a population-representative sample), respectively. Another study was conducted using an experience sampling design to also examine the hypotheses at the intra-individual level. Adding further methodical variety, the association of SC and coping was also explored meta-analytically in more detail. The multi-method approach helped to ensure that the findings could be generalized and replicated. Moreover, the main hypotheses and the design were pre-registered for the population-based sample at Open Science Framework. The hypothesis of the link between SC and healthier coping responses were additionally pre-registered at the international prospective register of systematic reviews PROSPERO. Nonetheless, some limitations need to be addressed in the following:

The first limitation to be mentioned is the further restricted generalizability of the findings, in regards to all three studies conducted for this PhD-thesis, as well as most studies included in the meta-analysis explored the assumed associations in Western cultures only. Results on the links between SC, stress processing, and affective well-being might vary from samples conducted in more Eastern countries, for instance, due to differences in stress regulation (Oyserman et al., 2002). Hence, future studies should investigate the assumed associations in more heterogeneous samples, also including participants from more Eastern parts of the world.

Second, for investigating the research questions of this thesis, exclusively self-report measures were used to assess relevant constructs. Former studies have also shown significant effects of brief self-compassion training on physiological responses to a stressful situation such as heart rate variability or salivary alpha-amylase (e.g., Arch et al., 2014; Arch et al., 2016). Thus, in future research self-report measures, referring to a more subjective view of stress processing, should be complemented by physiological markers of stress processing, such as indicators of the sympathetic or parasympathetic nervous system or peer reports of relevant constructs to give a deeper understanding of the relation between SC and different stress-related markers.

Third, to decrease the burden of expenditure in time for the participants as well as due to external restrictions, most measures of variables were shortened by cutting down the number of items of each construct. Though all assessments could be judged as face valid, original versions of the scales might mirror the whole concept of the measured constructs more broadly than the used abbreviated versions of the scales. Consequently, to replicate the findings, the relations between all variables should also be explored in more detail with the full versions of measures of all relevant variables. Moreover, it was only possible to consider a limited number of coping strategies, focusing on more popular and well-established strategies to form engagement and disengagement coping. As the coping construct is very complex, less common coping strategies which are not typically included in traditional classifications, such as rumination and worry, might show higher and more consistent associations to SC. Referring to the meta-analytical results of this thesis, especially rumination and worry were strongly negatively associated with SC, indicating that a self-compassionate mindset particularly facilitates individuals to not over-identify with their dysfunctional thoughts. Consequently, to generalize our findings in terms of the mediational pathway of coping, future research should explore the mediational role of a wider variety of different coping responses to untangle these underlying mechanisms in the relation between SC and affective well-being in more detail. Moreover, there is evidence pointing out the benefits of concepts closely linked to coping such as coping flexibility (i.e., the ability to shift between different coping strategies to find the most effective response) which helps to deal with a stressor more adaptively (Kato, 2012). It can be assumed that SC is related to more flexible situational coping, as well as more adaptive dispositional coping due to a higher capacity to rather choose from engagement coping responses (Keng et al., 2018). Therefore, to understand how SC applies its protective link with coping, further research should investigate by what means SC is associated with coping flexibility.

On further notice there has been an ongoing controversy about the concept of SC and its most common measurement: Specifically, there has been a debate about whether negative and positive items of Neff's Self-Compassion Scale (SCS, Neff, 2003a) should be merged into one total score (e.g., López et al., 2015; Muris & Petrocchi, 2017). Some researchers claimed that there might be a high possibility of confounding positive and negative characteristics of SC that inflate associations with mental health outcomes such as positive and negative affect (e.g., Körner et al., 2015; Muris & Petrocchi, 2017). Instead of using a total score, they suggest the use of a second higher-order model with two separate scales consisting of compassionate and uncompassionate self-responding. Taking the findings of this work into account, one could argue that especially engagement coping responses might emerge as a more consistent factor in the relation between compassionate self-responding and affective well-being. However, a transnational reanalysis of the factor structure from past single studies by Neff et al. (2019) provided further evidence for an overall SC score as well as for the six subscale scores solution, but not for two separate scales on behalf of compassionate and uncompassionate self-responding. Findings have additionally shown that more than 90% of the reliable variance in the scores of the SCS might be traced back to an overall SC factor (Neff et al., 2019). These findings validated the use of an overall SC score, which was therefore implemented in this PhD thesis as well. Nevertheless, as the debate about detecting the "significant" components of SC has not been ended yet (Muris & Otgaar, 2020; Neff, 2022), future studies using the full scale might take into account this debate by also investigating compassionate and uncompassionate self-responding and their associations with other outcomes and their underlying mechanisms separately.

In addition, studies conducted for this PhD thesis had a correlative, non-experimental design. Thus, all findings finally must be interpreted with caution referring to causal relations. By now, there only have been very few studies investigating the causal link between SC and coping using experimental designs to improve SC at the state and at the trait level, only

including rumination as a coping mechanism. For example, studies indicated that the evaluated Mindful Self-Compassion program to foster a more compassionate attitude in life holds promise for decreasing psychological distress and rumination, even after a three-month follow-up (Finlay-Jones, 2017). Moreover, greater rumination has hindered the level of mood improvements after a brief writing task facilitating a self-compassionate state after negative mood inductions (Odou & Brinker, 2013, 2014). Thus, further studies could explore the suggested pathways in long and short-term SC interventions in more detail by implementing experimental manipulations (e.g., Finlay-Jones, 2017; Smeets et al., 2014). Nevertheless, other factors might be influential in these relations as well as other directions between these concepts might be possible, such as pathways directing from affect or stress processing responses to SC. As SC has also been conceptualized as an effective emotion regulation strategy, it might be worthwhile to examine whether some individuals, who experience a large amount of stress and negative emotions in challenging circumstances, rather choose to be more self-compassionate to cope with such situations. In conclusion, this should be taken into account in future studies, including additional theoretical backgrounds.

Referring to the high between-study heterogeneity, which was revealed for the link between SC and almost all coping responses, the results of the meta-analysis clearly indicated that future research should also investigate possible moderators. Demographic sample characteristics, e.g., age and gender, are often identified as potential, influential factors (Bortz & Döring 2006). Since there has still been little research on the moderators of the relation between SC and coping, age, gender, and study region were thus exploratively analyzed in the present meta-analysis as well. However, these demographic variables seem to be less relevant in the link between SC and coping, considering the overall findings from the meta-analysis (Ewert et al., 2021). Hence, it could be noteworthy to take into account other moderators in further research, e.g., the influence of different sub-populations, such as whether the link of SC and more functional engagement coping responses is stronger in non-clinical samples

compared to clinical populations. Thus, future research might also examine these relations in clinical and subclinical samples as these might differ substantially compared to non-clinical samples and, therefore, could reveal different associations among these concepts.

Moreover, future studies should also explore promising moderator variables such as different types of stressors (e.g., controllable vs. uncontrollable), possibly moderating the pathways between SC and affective well-being through stress processing. For instance, as the pathway through disengagement coping responses turned out to be less relevant in the studies conducted for this thesis, this pathway might come to light in studies investigating the mediational role between a more self-compassionate attitude and affective well-being in uncontrollable contexts such as a severe, chronic disease. Additionally, as SC has also shown a substantial state component, situational cues (such as a compassionate environment in particular) might also play a significant role in engaging in more momentary SC, and more salutary stress processing. In turn, this might result in higher affective well-being on a specific occasion (e.g., the presence of demanding life events and individual variations in the ability to access more momentary SC under these stressful circumstances), which should be investigated in further research.

Finally, more studies are also needed to provide a deeper understanding of the relation between SC and stress appraisal processes in particular. The findings of this PhD thesis suggest that stress perception is the leading pathway to how SC unfolds its salutary effects on affective well-being. However, stress was conceptualized as a unidimensional construct (as has all previous research except for Chishima, 2018), and this approach does not consider the possibility of inconsistent findings in the link between SC and primary versus secondary appraisals. On the one hand, SC might reduce to experience a potential hazard as threatening, and so the need for coping could be diminished right from the onset. On the other hand, a higher self-compassionate attitude could help to perceive stressful events with a broader balanced awareness, to stay more relaxed and experience more controllability, which in turn

might lead to a perception of having more access to more functional coping responses (i.e., more engagement and less disengagement coping, Chishima et al., 2018). Future studies could examine both appraisal processes separately in more detail, which might give a clearer picture of whether the relations between SC and stress processing are influenced differently by primary and secondary appraisals.

8.4 Practical Implications

This work shed further light on how SC might work and unfold its protective effects. As the effects of momentary levels of SC were most prominent, these findings might give further guidance towards the improvement and development of proficient brief interventions.

Especially brief interventions that primarily facilitate higher levels of state SC on a specific occasion might be promising to diminish perceived stress and improve coping behavior in situations when needed. This, in turn, might help to maintain higher affective well-being. So far, broad intervention programs that aim to facilitate SC on a trait level have been broadly examined and are well-known for their protective effects on mental health outcomes (for a review, see Wilson et al., 2019). However, participants of these programs need to invest plenty of time and effort in training to improve their general ability to be more self-compassionate. To make such training more suitable for everyday life, possibly some very brief exercises from broader SC programs should be modified for easier accessibility on a given occasion when needed. Further research could explore the effectiveness of such adapted, brief exercises in facilitating SC at the trait as well as at the state level in daily life, which might also improve stress processing and other mental health outcomes on both levels.

8.5 Conclusions

The results of this PhD thesis have shown that SC plays a major role in more salutary stress processing at the dispositional as well as at the intra-individual level. Thus, with the multi-methodical approach, the relations between higher SC and less perceived stress, as well as healthier coping responses could be replicated. Taking the main objective of this PhD project

into consideration, all findings of the conducted studies clearly indicated a mediational pathway through stress processing in the link between SC and affective well-being, mainly reflected in the amount of perceived stress. Thus, with these results, it can be presumed that the most prominent pathway through more SC leads to more affective well-being in perceiving events as less stressful. Initial evidence is also given for the mediational pathway via healthier coping with demanding situations. However, the mediating role of coping might be reliant on specific coping responses and situational factors that could be investigated in further research. All in all, the findings of this PhD thesis are promising to provide more insight into ways in which SC might unfold its protective potential by facilitating effective stress processing, and thus, ultimately lead to higher affective well-being.

In closing, this PhD thesis is a further step towards a deeper understanding of the working mechanisms of SC in effective stress regulation and, hopefully, it helps to further establish it as an important construct in stress research. In order to generalize findings and, ultimately, be able to find causal evidence, further research is needed.

9 References

- Adams, C. E., & Leary, M. R. (2007). Promoting self-compassion toward eating among restrictive and guilty eaters. *Journal of Social and Clinical Psychology, 10*(10), 1120–1144. <https://doi.org/10.1521/jscp.2007.26.10.1120>
- Allen, A. B., & Leary, M. R. (2010). Self-Compassion, stress, and coping. *Social and Personality Psychology Compass, 4*(2), 107–118. <https://doi.org/10.1111/j.1751-9004.2009.00246.x>
- Arch, J. J., Brown, K. W., Dean, D. J., Landy, L. N., Brown, K. D., & Laudenslager, M. L. (2014). Self-compassion training modulates alpha-amylase, heart rate variability, and subjective responses to social evaluative threat in women. *Psychoneuroendocrinology, 42*, 49–58. <https://doi.org/10.1016/j.psyneuen.2013.12.018>
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*(12), 1849–1858. <https://doi.org/10.1016/j.brat.2005.12.007>
- Arch, J. J., Landy, L. N., & Brown, K. W. (2016). Predictors and moderators of biopsychological social stress responses following brief self-compassion meditation training. *Psychoneuroendocrinology, 69*, 35–40. <https://doi.org/10.1016/j.psyneuen.2016.03.009>
- Armstrong, L., & Rimes, K. A. (2016). Mindfulness-Based Cognitive Therapy for neuroticism (stress vulnerability): A pilot randomized study. *Behavior Therapy, 47*(3), 287–298. <https://doi.org/10.1016/j.beth.2015.12.005>
- Barnard, L. K., & Curry, J. F. (2011). Self-compassion: Conceptualizations, correlates, & interventions. *Review of General Psychology, 15*(4), 289–303. <https://doi.org/10.1037/a0025754>

- Biegel, G. (2010). *The stress reduction workbook for teens: Mindfulness skills to help you deal with stress*. New Harbinger Publications.
<https://www.newharbinger.com/9781684030187/the-stress-reduction-workbook-for-teens/>
- Bluth, K. & Neff, K. D. (2018). New frontiers in understanding the benefits of self-compassion. *Self and Identity*, 17(6), 605–608.
<https://doi.org/10.1080/15298868.2018.1508494>
- Bluth, K., Roberson, P. N. E., Gaylord, S. A., Faurot, K. R., Grewen, K. M., Arzon, S., & Girdler, S. S. (2016). Does self-compassion protect adolescents from stress? *Journal of Child and Family Studies*, 25(4), 1098–1109. <https://doi.org/10.1007/s10826-015-0307-3>
- Bortz, J., & Döring, N. (2006). *Forschungsmethoden und Evaluation: Für Human- und Sozialwissenschaftler (4., überarb. Aufl.,)*. [Research methods and evaluation: for human and social scientists (4th ed.)]. Springer-Medizin-Verlag.
https://www.researchgate.net/publication/28356346_Forschungsmethoden_und_Evaluation_fur_Human-_und_Sozialwissenschaftler
- Breines, J. G., & Chen, S. (2013). Activating the inner caregiver: The role of support-giving schemas in increasing state self-compassion. *Journal of Experimental Social Psychology*, 49(1), 58–64. <https://doi.org/10.1016/j.jesp.2012.07.015>
- Brion, J. M., Leary, M. R., & Drabkin, A. S. (2014). Self-compassion and reactions to serious illness: The case of HIV. *Journal of Health Psychology*, 19(2), 218–229.
<https://doi.org/10.1177/1359105312467391>
- Brown, B. (1999). *Soul without shame: A guide to liberating yourself from the judge within*. Shambhala Publications. <https://www.shambhala.com/soul-without-shame-1388.html>

- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822–848. <https://doi.org/10.1037/0022-3514.84.4.822>
- Carver, C. S., & Connor-Smith, J. (2010). Personality and Coping. *Annual Review of Psychology, 61*(1), 679–704. <https://doi.org/10.1146/annurev.psych.093008.100352>
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267–283. <https://doi.org/10.1037/0022-3514.56.2.267>
- Chen, F. F., Jing, Y., Hayes, A., & Lee, J. M. (2013). Two concepts or two approaches? A bifactor analysis of psychological and subjective well-being. *Journal of Happiness Studies, 14*(3), 1033–1068. <https://doi.org/10.1007/s10902-012-9367-x>
- Chishima, Y., Mizuno, M., Sugawara, D., & Miyagawa, Y. (2018). The influence of self-compassion on cognitive appraisals and coping with stressful events. *Mindfulness, 9*(6), 1907–1915. <https://doi.org/10.1007/s12671-018-0933-0>
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 558–577. <https://doi.org/10.1037/0021-843X.112.4.558>
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin, 127*(1), 87–127. <https://doi.org/10.1037//0033-2909.127.1.87>
- Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin, 143*(9), 939–991. <https://doi.org/10.1037/bul0000110>

- Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology, 93*(6), 1080–1107.
<https://doi.org/10.1037/0022-3514.93.6.1080>
- Costa, J., & Pinto-Gouveia, J. (2013). Experiential avoidance and self-compassion in chronic pain. *Journal of Applied Social Psychology, 43*(8), 1578–1591.
<https://doi.org/10.1111/jasp.12107>
- Crary, P. (2013). Beliefs, behaviors, and health of undergraduate nursing students. *Holistic Nursing Practice, 27*(2), 74–88. <https://doi.org/10.1097/HNP.0b013e318280f75e>
- Davidson, R. J., & Harrington, A. (2002). *Visions of Compassion: Western Scientists and Tibetan Buddhists Examine Human Nature*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780195130430.001.0001>
- Davies, M. I., & Clark, D. M. (1998). Thought suppression produces a rebound effect with analogue post-traumatic intrusions. *Behaviour Research and Therapy, 36*(6), 571–582.
[https://doi.org/10.1016/S0005-7967\(98\)00051-5](https://doi.org/10.1016/S0005-7967(98)00051-5)
- Deisinger, J. A., Cassisi, J. E., & Whitaker, S. L. (2003). Relationships between coping style and PAI profiles in a community sample. *Journal of Clinical Psychology, 59*(12), 1315–1323. <https://doi.org/10.1002/jclp.10223>
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542–575.
<https://doi.org/10.1037/0033-2909.95.3.542>
- Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour, 2*(4), 253–260. <https://doi.org/10.1038/s41562-018-0307-6>
- Dupasquier, J. R., Kelly, A. C., Waring, S. V., & Moscovitch, D. A. (2020). Self-compassionate college women report receiving more social support in the face of distress: Evidence from a daily diary study. *Personality and Individual Differences, 154*(6), 109680. <https://doi.org/10.1016/j.paid.2019.109680>

- Edwards, M., Adams, E. M., Waldo, M., Hadfield, O. D., & Biegel, G. M. (2014). Effects of a mindfulness group on Latino adolescent students: Examining levels of perceived stress, mindfulness, self-compassion, and psychological symptoms. *The Journal for Specialists in Group Work, 39*(2), 145–163. <https://doi.org/10.1080/01933922.2014.891683>
- Ewert, C., Gaube, B., & Geisler, F. C. M. (2018). Dispositional self-compassion impacts immediate and delayed reactions to social evaluation. *Personality and Individual Differences, 125*, 91–96. <https://doi.org/10.1016/j.paid.2017.12.037>
- Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-Compassion and Coping: a Meta-Analysis. *Mindfulness, 12*(5), 1063–1077. <https://doi.org/10.1007/s12671-020-01563-8>
- Exline, J. J., Homolka, S. J., & Harriott, V. A. (2016). Divine struggles: Links with body image concerns, bingeing, and compensatory behaviours around eating. *Mental Health, Religion & Culture, 19*(1), 8–22. <https://doi.org/10.1080/13674676.2015.1087977>
- Finlay-Jones, A. L. (2017). The relevance of self-compassion as an intervention target in mood and anxiety disorders: A narrative review based on an emotion regulation framework. *Clinical Psychologist, 21*(2), 90–103. <https://doi.org/10.1111/cp.12131>
- Fleeson, W., & Jayawickreme, E. (2015). Whole Trait Theory. *Journal of Research in Personality, 56*, 82–92. <https://doi.org/10.1016/j.jrp.2014.10.009>
- Folkman, S., & Lazarus, R. S. (1988). Coping as a mediator of emotion. *Journal of Personality and Social Psychology, 54*(3), 466.
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology, 50*(3), 571–579. <https://doi.org/10.1037/0022-3514.50.3.571>

- Fontaine, K. R., Manstead, A. S., & Wagner, H. (1993). Optimism, perceived control over stress, and coping. *European Journal of Personality, 7*, 267–281.
<https://doi.org/10.1002/per.2410070407>
- Fortune, D. G., Richards, H. L., Griffiths, C. E. M., & Main, C. J. (2002). Psychological stress, distress and disability in patients with psoriasis: consensus and variation in the contribution of illness perceptions, coping and alexithymia. *British Journal of Clinical Psychology, 41*(2), 157–174. <https://doi.org/10.1348/014466502163949>
- Fresnics, A., & Borders, A. (2016). Angry rumination mediates the unique associations between self-compassion and anger and aggression. *Mindfulness, 50*(7), 554–564.
<https://doi.org/10.1007/s12671-016-0629-2>
- Gard, T., Brach, N., Hölzel, B. K., Noggle, J. J., Conboy, L. A., & Lazar, S. W. (2012). Effects of a yoga-based intervention for young adults on quality of life and perceived stress: The potential mediating roles of mindfulness and self-compassion. *The Journal of Positive Psychology, 7*(3), 165–175. <https://doi.org/10.1080/17439760.2012.667144>
- Germer, C. K., & Neff, K. D. (2013). Self-compassion in clinical practice. *Journal of Clinical Psychology, 69*(8), 856–867. <https://doi.org/10.1002/jc1p.22021>
- Gilbert, P. (2005). Compassion: Conceptualisations, research and use in psychotherapy: & (2005). Focused therapies and compassionate mind training for shame and self-attacking. In Paul Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy* (pp. 263–325). Brunner-Routledge.
<https://www.cambridge.org/core/journals/the-british-journal-of-psychiatry/article/compassion-conceptualisations-research-and-use-in-psychotherapy-edited-by-paul-gilbert-london-routledge-2005-408-pp-1999-pb-isbn-158391983x/933A2C87E6F60CB7ED39A5F6529717C3>

- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, *13*(6), 353–379. <https://doi.org/10.1002/cpp.507>
- Gillanders, D. T., Sinclair, A. K., MacLean, M., & Jardine, K. (2015). Illness cognitions, cognitive fusion, avoidance and self-compassion as predictors of distress and quality of life in a heterogeneous sample of adults, after cancer. *Journal of Contextual Behavioral Science*, *4*(4), 300–311. <https://doi.org/10.1016/j.jcbs.2015.07.003>
- Gross, J. J. (2007). *Handbook of emotion regulation*. Guilford Press.
https://www.researchgate.net/publication/285501515_Handbook_of_emotion_regulation
- Hamrick, L. A., & Owens, G. P. (2018). Exploring the mediating role of self-blame and coping in the relationships between self-compassion and distress in females following the sexual assault. *Journal of Clinical Psychology*, *75*(4), 766–779.
<https://doi.org/10.1002/jclp.22730>
- Hollis-Walker, L., & Colosimo, K. (2011). Mindfulness, self-compassion, and happiness in non-meditators: A theoretical and empirical examination. *Personality and Individual Differences*, *50*(2), 222–227. <https://doi.org/10.1016/j.paid.2010.09.033>
- Homan, K. J., & Sirois, F. M. (2017). Self-compassion and physical health: Exploring the roles of perceived stress and health-promoting behaviors. *Health Psychology Open*, *4*(2), 2055102917729542. <https://doi.org/10.1177/2055102917729542>
- Hupfeld, J., & Ruffieux, N. (2011). Validierung einer deutschen Version der Self-Compassion Scale (SCS-D) [Validation of the German Self-compassion Scale (SCS-D)]. *Zeitschrift Für Klinische Psychologie Und Psychotherapie*, *40*(2), 115–123.
<https://doi.org/10.1026/1616-3443/a000088>
- Johnson, E. A., & O'Brien, K. A. (2013). Self-Compassion soothes the savage ego-threat system: Effects on negative affect, shame, rumination, and depressive symptoms.

- Journal of Social and Clinical Psychology*, 32(9), 939–963.
<https://doi.org/10.1521/jscp.2013.32.9.939>
- Kabat-Zinn, J. (2003). Mindfulness-Based Interventions in Context: Past, Present, and Future. *Clinical Psychology: Science and Practice*, 10(2), 144–156.
<https://doi.org/10.1093/clipsy/bpg016>
- Kato, T. (2012). Development of the Coping Flexibility Scale: evidence for the coping flexibility hypothesis. *Journal of Counseling Psychology*, 59(2), 262–273.
<https://doi.org/10.1037/a0027770>.
- Kelly, A. C., & Stephen, E. (2016). A daily diary study of self-compassion, body image, and eating behavior in female college students. *Body Image*, 17, 152–160.
<https://doi.org/10.1016/j.bodyim.2016.03.006>
- Keng, S. L., Choo, X., & Tong, E. M. W. (2018). Association between trait mindfulness and variability of coping strategies: a diary study. *Mindfulness*, 9(5), 1423–1432.
<https://doi.org/10.1007/s12671-018-0885-4>.
- Kirschbaum, C., Pirke, K.-M., & Hellhammer, D. H. (1993). The 'Trier Social Stress Test' - A tool for investigating psychological stress responses in a laboratory setting. *Neuropsychology*, 28, 76–81. <https://doi.org/10.1159/000119004>
- Körner, A., Coroiu, A., Copeland, L., Gomez-Garibello, C., Albani, C., Zenger, M., & Brähler, E. (2015). The role of self-compassion in buffering symptoms of depression in the general population. *PloS One*, 10(10), e0136598.
<https://doi.org/10.1371/journal.pone.0136598>
- Krieger, T., Altenstein, D., Baettig, I., Doerig, N., & Holtforth, M. G. (2013). Self-compassion in depression: Associations with depressive symptoms, rumination, and avoidance in depressed outpatients. *Behavior Therapy*, 44(3), 501–513.
<https://doi.org/10.1016/j.beth.2013.04.004>

- Krieger, T., Berger, T., & Holtforth, M. G. (2016). The relationship of self-compassion and depression: Cross-lagged panel analyses in depressed patients after outpatient therapy. *Journal of Affective Disorders, 202*, 39–45. <https://doi.org/10.1016/j.jad.2016.05.032>
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry, 11*(3), 129–141. https://doi.org/10.1207/S15327965PLI1103_01
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw-Hill.
[https://openlibrary.org/books/OL5954225M/Psychological_stress_and_the_coping_pr
ocess](https://openlibrary.org/books/OL5954225M/Psychological_stress_and_the_coping_process)
- Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press, Inc.
[https://global.oup.com/academic/product/emotion-and-adaptation-
9780195069945?cc=de&lang=en&](https://global.oup.com/academic/product/emotion-and-adaptation-9780195069945?cc=de&lang=en&)
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company. [https://books.google.de/books/about/Stress_Appraisal_
and_Coping.html?id=i-ySQQuUpr8C&redir_esc=y](https://books.google.de/books/about/Stress_Appraisal_and_Coping.html?id=i-ySQQuUpr8C&redir_esc=y).
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*(3), 141–169.
<https://doi.org/10.1002/per.2410010304>
- Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology, 92*(5), 887–904.
<https://doi.org/10.1037/0022-3514.92.5.887>
- Li, Y., Deng, J., Lou, X., Wang, H., & Wang, Y. (2020). A daily diary study of the relationships among daily self-compassion, perceived stress and health-promoting behaviours. *International Journal of Psychology: Journal International De Psychologie, 55*(3), 364–372. <https://doi.org/10.1002/ijop.12610>

- López, A., Sanderman, R., Ranchor, A. V., & Schroevers, M. J. (2018). Compassion for Others and Self-Compassion: Levels, Correlates, and Relationship with Psychological Well-being. *Mindfulness*, *9*(1), 325–331. <https://doi.org/10.1007/s12671-017-0777-z>
- López, A., Sanderman, R., Smink, A., Zhang, Y., van Sonderen, E., Ranchor, A., & Schroevers, M. J. (2015). A Reconsideration of the Self-Compassion Scale's Total Score: Self-Compassion versus Self-Criticism. *PloS One*, *10*(7), e0132940. <https://doi.org/10.1371/journal.pone.0132940>
- Lyne, K., & Roger, D. (2000). A psychometric re-assessment of the COPE questionnaire. *Personality and Individual Differences*, *29*(2), 321–335. [https://doi.org/10.1016/S0191-8869\(99\)00196-8](https://doi.org/10.1016/S0191-8869(99)00196-8)
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, *32*(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>
- Mantzios, M., Wilson, J. C., & Giannou, K. (2015). Psychometric properties of the Greek versions of the self-compassion and mindful attention and awareness scales. *Mindfulness*, *6*(1), 123–132. <https://doi.org/10.1007/s12671-013-0237-3>
- Marshall, E.-J., & Brockman, R. N. (2016). The relationships between psychological flexibility, self-compassion, and emotional well-Being. *Journal of Cognitive Psychotherapy*, *30*(1), 60–72. <https://doi.org/10.1891/0889-8391.30.1.60>
- Moskowitz, D. S., Brown, K. W., & Coté, S. (1997). Reconceptualizing stability: Using time as a psychological dimension. *Current Directions in Psychological Science*(6), 127–132. <https://doi.org/10.1111/1467-8721.ep10772890>
- Mowlaie, M., Mikaeili, N., Aghababaei, N., Ghaffari, M., & Pouresmali, A. (2016). The relationships of sense of coherence and self-compassion to worry: The Mediating Role of Personal Intelligence. *Current Psychology*, *10*(3), 239. <https://doi.org/10.1007/s12144-016-9451-1>

- Muris, P., & Otgaar, H. (2020). The Process of Science: A Critical Evaluation of more than 15 Years of Research on Self-Compassion with the Self-Compassion Scale. *Mindfulness, 11*(6), 1469–1482. <https://doi.org/10.1007/s12671-020-01363-0>
- Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. *Clinical Psychology & Psychotherapy, 24*(2), 373–383. <https://doi.org/10.1002/cpp.2005>
- Neff, K. D. (2003a). The Development and Validation of a Scale to Measure Self-Compassion. *Self and Identity, 2*, 223–250. <https://doi.org/10.1080/15298860390209035>
- Neff, K. D. (2003b). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2*, 85–101. <https://doi.org/10.1037/e342422004-001>
- Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*(3), 223–250. <https://doi.org/10.1080/15298860309027>
- Neff, K. D. (2022). The differential effects fallacy in the study of self-compassion: misunderstanding the nature of bipolar continuums. *Mindfulness, 13*(3), 572–576. <https://doi.org/10.1007/s12671-022-01832-8>
- Neff, K. D., & Beretvas, S. N. (2013). The role of self-compassion in romantic relationships. *Self and Identity, 12*(1), 78–98. <https://doi.org/10.1080/15298868.2011.639548>
- Neff, K. D., & Dahm, K. A. (2015). Self-compassion: What it is, what it does, and how it relates to mindfulness. In B.D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 121–137). Springer. https://doi.org/10.1007/978-1-4939-2263-5_10
- Neff, K. & Germer, C. (2017). Self-Compassion and Psychological Well-Being. In E. M. Seppälä, E. Simon-Thomas, S. L. Brown, M. C. Worline, C. D. Cameron, & J. R.

- Doty (Eds.), *Oxford Handbook of Compassion Science* (pp. 371–385). Oxford University Press.
- Neff, K. D., Hsieh, Y.-P., & DeJitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity, 4*(3), 263–287.
<https://doi.org/10.1080/13576500444000317>
- Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007a). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality, 41*(1), 139–154.
<https://doi.org/10.1016/j.jrp.2006.03.004>
- Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and Identity, 9*(3), 225–240.
<https://doi.org/10.1080/15298860902979307>
- Neff, K. D., & Pommier, E. (2013). The relationship between self-compassion and other-focused concern among college undergraduates, community adults, and practicing meditators. *Self and Identity, 12*(2), 160–176.
<https://doi.org/10.1080/15298868.2011.649546>
- Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007b). An examination of self-compassion in relation to positive psychological functioning and personality traits. *Journal of Research in Personality, 41*(4), 908–916. <https://doi.org/10.1016/j.jrp.2006.08.002>
- Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., Guo, H. X., Hirsch, J. K., Hupfeld, J., Hutz, C. S., Kotsou, I., Lee, W. K., Montero-Marín, J., Sirois, F. M., Souza, L. K. de, Svendsen, J. L., Wilkinson, R. B., & Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment, 31*(1), 27–45. <https://doi.org/10.1037/pas0000629>

- Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality, 77*(1), 23–50.
<https://doi.org/10.1111/j.1467-6494.2008.00537.x>
- Odou, N., & Brinker, J. (2013). Exploring the relationship between rumination, self-compassion, and mood. *Self and Identity, 13*(4), 449–459.
<https://doi.org/10.1080/15298868.2013.840332>
- Odou, N., & Brinker, J. (2014). Self-compassion, a better alternative to rumination than distraction as a response to negative mood. *The Journal of Positive Psychology, 10*(5), 447–457. <https://doi.org/10.1080/17439760.2014.967800>
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*(1), 3–72. <https://doi.org/10.1037//0033-2909.128.1.3>
- Penley, J. A., & Tomaka, J. (2002). Associations among the Big Five, emotional responses, and coping with acute stress. *Personality and Individual Differences, 32*(7), 1215–1228. [https://doi.org/10.1016/S0191-8869\(01\)00087-3](https://doi.org/10.1016/S0191-8869(01)00087-3)
- Petrocchi, N., Ottaviani, C., & Couyoumdjian, A. (2014). Dimensionality of self-compassion: Translation and construct validation of the self-compassion scale in an Italian sample. *Journal of Mental Health (Abingdon, England), 23*(2), 72–77.
<https://doi.org/10.3109/09638237.2013.841869>
- Pinto-Gouveia, J [Jose], Galhardo, A., Cunha, M., & Matos, M. (2012). Protective emotional regulation processes towards adjustment in infertile patients. *Human Fertility (Cambridge, England), 15*(1), 27–34. <https://doi.org/10.3109/14647273.2011.654310>
- Raes, F., Pommier, E., Neff, K. D., & van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy, 18*(3), 250–255. <https://doi.org/10.1002/cpp.702>

- Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist*, *41*(7), 813–819. <https://doi.org/10.1037//0003-066X.41.7.813>
- Rubin, D. C., Hoyle, R. H., & Leary, M. R. (2012). Differential predictability of four dimensions of affect intensity. *Cognition & Emotion*, *26*(1), 25–41. <https://doi.org/10.1080/02699931.2011.561564>
- Ryff, C. D. (1989). Happiness Is Everything, or Is It? Explorations on the Meaning of Psychological Well-Being. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Sbarra, D. A., Smith, H. L., & Mehl, M. R. (2012). When leaving your ex, love yourself: Observational ratings of self-compassion predict the course of emotional recovery following marital separation. *Psychological Science*, *23*(3), 261–269. <https://doi.org/10.1177/0956797611429466>
- Schahn, J. & Amelang, M. (1992). Mittelwertsunterschiede zwischen Selbst- und Fremdbeurteilungen: Eine vernachlässigte Größe? [Differences in means between self and peerratings: A neglected subject?] *Diagnostica*, *38*(3), 187-208.
- Schnider, K. R., Elhai, J. D., & Gray, M. J. (2007). Coping style use predicts posttraumatic stress and complicated grief symptom severity among college students reporting a traumatic loss. *Journal of Counseling Psychology*, *54*(3), 344–350. <https://doi.org/10.1037/0022-0167.54.3.344>
- Selig, J. P., & Preacher, K. J. (2009). Mediation models for longitudinal data in developmental research. *Research in Human Development*, *6*(2-3), 144–164. <https://doi.org/10.1080/15427600902911247>
- Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education in Professional Psychology*, *1*(2), 105–115. <https://doi.org/10.1037/1931-3918.1.2.105>

- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2014). Self-compassion, stress, and coping in the context of chronic illness. *Self and Identity, 14*(3), 334–347.
<https://doi.org/10.1080/15298868.2014.996249>
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin, 129*(2), 216–269. <https://doi.org/10.1037/0033-2909.129.2.216>
- Smeets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. *Journal of Clinical Psychology, 70*(9), 794–807. <https://doi.org/10.1002/jclp.22076>
- Stanton, A. L., Kirk, S. B., Cameron, C. L., & Danoff-Burg, S. (2000). Coping through emotional approach: Scale construction and validation. *Journal of Personality and Social Psychology, 78*(6), 1150–1169. <https://doi.org/10.1037//0022-3514.78.6.1150>
- Stutts, L. A., Leary, M. R., Zeveney, A. S., & Hufnagle, A. S. (2018). A longitudinal analysis of the relationship between self-compassion and the psychological effects of perceived stress. *Self and Identity, 17*(6), 609–626.
<https://doi.org/10.1080/15298868.2017.1422537>
- Techniker Krankenkasse (2022, December 07). Stressstudie 2021: Entspann dich, Deutschland! [Stress study 2021: Relax, Germany!].
<https://www.tk.de/resource/blob/2118106/cbdb7ed26363a35145d753516510f92d/stressstudie-2021-pdf-zum-download-data.pdf>
- Terry, M. L., & Leary, M. R. (2011). Self-compassion, self-regulation, and health. *Self and Identity, 10*(3), 352–362. <https://doi.org/10.1080/15298868.2011.558404>
- van Dam, N. T., Sheppard, S. C., Forsyth, J. P., & Earleywine, M. (2011). Self-compassion is a better predictor than mindfulness of symptom severity and quality of life in mixed anxiety and depression. *Journal of Anxiety Disorders, 25*(1), 123–130.
<https://doi.org/10.1016/j.janxdis.2010.08.011>

- Webb, J. B., & Forman, M. J. (2013). Evaluating the indirect effect of self-compassion on binge eating severity through cognitive-affective self-regulatory pathways. *Eating Behaviors, 14*(2), 224–228. <https://doi.org/10.1016/j.eatbeh.2012.12.005>
- Weinstein, N., Brown, K. W [Kirk W.], & Ryan, R. M. (2009). A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *Journal of Research in Personality, 43*(3), 374–385. <https://doi.org/10.1016/j.jrp.2008.12.008>
- Whitmer, A. J., & Gotlib, I. H. (2013). An attentional scope model of rumination. *Psychological Bulletin, 139*(5), 1036–1061. <https://doi.org/10.1037/a0030923>
- Wilson, A. C., Mackintosh, K., Power, K., & Chan, S. W. Y. (2019). Effectiveness of self-compassion related therapies: a systematic review and meta-analysis. *Mindfulness, 10*(6), 979–995. <https://doi.org/10.1007/s12671-018-1037-6>
- Wong, C. C. Y., & Yeung, N. C. Y. (2017). Self-compassion and posttraumatic growth: Cognitive Processes as Mediators. *Mindfulness, 4*(2), 107. <https://doi.org/10.1007/s12671-017-0683-4>
- Woods, H., & Proeve, M. (2014). Relationships of mindfulness, self-compassion, and meditation experience with shame-proneness. *Journal of Cognitive Psychotherapy, 28*(1), 20–33. <https://doi.org/10.1891/0889-8391.28.1.20>
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology. Health and Well-Being, 7*(3), 340–364. <https://doi.org/10.1111/aphw.12051>
- Zuroff, D. C., Clegg, K.-A., Levine, S. L., Hermanto, N., Armstrong, B. F., Haward, B., & Thode, S. (2021). Beyond trait models of self-criticism and self-compassion: Variability over domains and the search for signatures. *Personality and Individual Differences, 170*(4), 110429. <https://doi.org/10.1016/j.paid.2020.110429>

Eidesstattliche Erklärung

Sehr geehrte Damen und Herren,

hiermit versichere ich, dass ich die Dissertation mit dem Titel: „The Role of Self-Compassion in Effective Stress Processing – A Multimethod Approach“ selbstständig verfasst habe. Dabei habe ich keine anderen als die angegebenen Hilfsmittel genutzt. Alle wörtlich oder inhaltlich übernommenen Stellen habe ich als solche gekennzeichnet.

Ich erkläre außerdem, dass ich die Dissertation in gegenwärtiger oder anderer Abfassung nur in diesem und keinem anderen Promotionsverfahren eingereicht habe und, dass diesem Promotionsverfahren keine endgültig gescheiterten Promotionsverfahren vorausgegangen sind.

Ort, Datum

Unterschrift