The relationship between self-efficacy and self-compassion: An Experience Sampling Study

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Abstract

Background: A recent study has found a positive association between self-efficacy and self-compassion on the between-person level. Researchers have concluded that someone who is highly self-efficacious, is also more likely to be self-compassionate, as that person is able to understand their failures in a kind manner and can enhance the competences with feedback. However, no research has studied the relationship on the within-person level, leaving open the question of how state levels of self-efficacy and self-compassion fluctuate and influence each other during people's days. **Objectives:** The goal of this study was to examine student's self-efficacy and self-compassion scores on the trait and state level. It was therefore explored whether the association of state self-efficacy is more determined on the trait level of self-compassion (between-person) or the state level of self-compassion (within-person). **Method:** An experience sampling study was applied to 30 students to collect their self-efficacy and self-compassion trait and state level. The traits were measured by the New General Self-Efficacy Scale (NSGE) and the Self-Compassion Scale-Short Form (SCS-SF). The states were measured three times a day over a period of eight days with two items of each trait questionnaire. **Results:** No significant results were found between trait self-efficacy and trait self-compassion. Further, the average state scores do not predict the trait level. However, a significant association was found between both average state scores of self-efficacy and self-compassion. The result of the Linear Mixed Model indicate that state self-efficacy is not better predicted by the average state of self-compassion, than by the momentary level of self-compassion. Here, a weak positive correlation between state self-efficacy and the average state of self-compassion and state self-compassion was found. **Discussion:** The study's results have shown that self-efficacy and self-compassion barely influence each other. Thus, someone who is mostly self-compassionate during their lifetime, does not at the same time be feeling self-efficacious and vice versa. However, someone feeling self-compassionate in one moment is slightly more likely to feel successful at the same time, while someone feeling less self-compassionate is slightly more likely to feel unsuccessful. In general, this study had a rather small sample, short timeframe and obtained an invalid state questionnaire, wherefore a more extended experience sampling method should be applied to examine this relationship in the future.

Keywords: experience sampling method, self-efficacy, self-compassion, trait measures, state measures, between-person, within-person

The relationship between self-efficacy and self-compassion: An experience sampling study

Over the recent years, positive characteristics like self-efficacy and self-compassion have been found to influence a person's well-being and distress level (Soysa & Wilcomb, 2015). Recently, a study has found a promising association between self-efficacy and self-compassion, indicating that individuals high in self-efficacy are also high in self-compassion, and vice versa (Iskender, 2009). While self-efficacy was presented by Bandura (2010) and can be described as an individual's belief in their ability to perform a specific task effectively, self-compassion was presented by Neff (2003) and can best be characterised as being kind towards oneself even when one encounters disappointment.

Separately, lots of studies have analysed both self-efficacy and self-compassion on their trait levels while collecting one-time measurements in experimental settings. In general, a trait can be described as a long-term characteristic that is enduring and lifelong. Traits are displayed more steadily through a person's behaviour and emotions but are not visible at all times (Fridhandler, 1986). For example, someone who is extroverted, is more likely to be social on the daily level but can also experience moments of isolation (Fleeson, 2001). This in turn, would describe the state of a person, which is more of a temporal condition and describes a person's behaviour or emotion depending on situational factors (Fridhandler, 1986). Thus, a person is talkative and enjoys people in a certain situation but will stop being talkative when said situation has passed (Fleeson, 2001). Individual state differences are vital to the value of the trait concept. States change significantly for every person, but the average state can be used to describe the trait of that person. For instance, somebody high in trait extraversion will show daily fluctuations in their social behaviour; however, at an overall higher level than someone who's low in extraversion (Fleeson, 2001).

However, less attention was paid towards this state level of both constructs as almost no studies have gathered multiple measurements (within-person effect) on individual's daily basis in their natural environment. The within-person effect (states) describes the variation in a sample as multiple measure points are collected. With this, it can be analysed how much people change over time. So far, mostly between-person data (traits) is used to explain individuals' behaviours or emotions. The between-person effect describes differences between individuals by selecting one-time measurements (Curran & Bauer, 2011). However, researchers have concluded that the measures of between-person data are a rather inadequate indicator of within-person data. This is

because within-person fluctuations of behaviour and emotions are a reaction to variability in situations. Thus, within-person variability can define the same person behaving differently in various situations (Curran & Bauer, 2011; Fleeson, 2001). So far, information for self-efficacy and self-compassion is missing on that level. It can even be assumed that momentary fluctuations between both constructs might even have a negative association on the within-person level. As self-efficacy and self-compassion are also emotional experiences, they can be described as affective states, fluctuating over time (Neff et al., 2021; Shelton, 1990). Therefore, this study wants to add to the conclusions derived from the between-person level of both constructs and analyse the association on the within-person level. With this, the relationship between self-efficacy and self-compassion can be better understood as the differences between trait and state levels will be examined.

Self-Efficacy

Self-efficacy was characterised by Bandura (2012) as individuals' belief about their abilities to create designated degrees of performance. Therefore, self-efficacy was found to depend on the perceived difficulty of the task at hand, wherefore individuals may, at the same time, have high self-efficacy for a certain task and low self-efficacy for another tasks (Heslin & Klehe, 2006). Finally, the belief about the competence on a task define how individuals think, feel and behave (Bandura, 2010). When learning specific skills, high self-efficacy makes individuals seek to improve their mistakes and previously used strategies instead of searching for excuses (Chemers et al., 2001; Heslin & Klehe, 2006). High self-efficacy enhances peoples' ability to gather important information, make good choices based on that information, and finally, make the right move. In contrast to this, people with low self-efficacy people regularly consider critical feedback as affirming their inexperience and inability (Epton & Harris, 2008). This can lead to an endless loop, where ambiguous outcomes are regarded as proof of apparent incompetence, further bringing down a person's self-efficacy, effort, and performance (Chemers et al., 2001).

To understand the difference between self-efficacies trait- and state-levels, the constructs of generalised self-efficacy and specific self-efficacy can be used (Gardner & Pierce, 2011; Shelton, 1990). The categorisation of Bandura regarding self-efficacy is mostly situation-dependent and can be seen as a state (Shelton, 1990). Therefore, specific self-efficacy can be

described as task-specific, which explains individual differences in motivation and performance. Thus, state or specific self-efficacy is determined through the degree of achievement and approach motivational processes that individuals encounter in their daily work (Chen et al., 2004). It, therefore, changes over time with an accumulation of success and failure of experiences (Shelton, 1990). In contrast to Bandura's view on specific self-efficacy, generalised self-efficacy was found to be another critical predictor of individuals overall performance and can be seen as a generalised trait (Shelton, 1990). Generalised self-efficacy is a steady cognition that individuals convey, mirroring the expectation that they can successfully perform well in different situations. Individuals high in generalized self-efficacy foresee that they are going to succeed at achieving well in a variety of conditions (Gardner and Pierce, 2011). However, no study was found that analysed the difference between trait and state self-efficacy in people's daily lives, wherefore the relationship between the construct’s trait- and state-levels can be questioned and should be further examined.

Self-compassion

Self-compassion can be defined as being receptive to one's struggles, recognising feelings of kindness to oneself and taking a non-judgemental view of one's mistakes (Leary et al., 2007). Neff (2003) further conceptualised self-compassion, including self-kindness, awareness of common humanity, and mindfulness, while excluding self-judgements, over-identification, and isolation. Self-kindness is identified as responding with comprehension and kindness toward oneself when encountering negative situations. Common humanity is identified as considering one's life as a feature of the bigger human experience and understanding that everybody experiences troublesome times. Mindfulness is identified as holding one's feelings in non-judgmental awareness (Adams & Leary, 2007).

All relationships stated above have been measured in terms of singular between-person data, and therefore, describe the effect of trait self-compassion for individuals. Therefore, trait self-compassion was described as an implicit (unconscious and autonomic) system of emotion regulation. This entails the acceptance and non-judgemental view of an individual towards internal and external stressors (Svendsen et al., 2016). Interestingly, Neff and colleagues (2021) have only recently come to determine state self-compassion and have concluded that state self-compassion can be characterised by the overall six parts of self-compassion as well. The vital

difference between trait and state self-compassion is the changing nature of the individual's state depending on the situation (Neff et al., 2021). Especially when in difficult situations, the level of state self-compassion can be seen as crucial (Thøgersen-Ntoumani et al, 2017). One study assumed that state self-compassion might be more present in circumstances when one is under threat. Only when one feels self-compassionate does that person feel less stressed (Thøgersen-Ntoumani et al., 2017). Thus, self-compassion is acting as a buffer in these stressful and dissatisfactory moments (Neff, Kirkpatrick, & Rude, 2007). Finally, one study has analysed the effects of trait self-compassion towards state self-compassion and has concluded that trait levels predicted state levels of self-compassion. Thus, someone who is high in self-compassion is more likely to show adaptive responses in daily difficult situations, which is reflected in their state-level (Waring and Kelly, 2019). However, all studies have expressed the need for further analysis between the trait-state variance in self-compassion (Neff et a., 2021; Thøgersen-Ntoumani et al., 2017) and only one study has explicitly analysed the relationship between trait and state self-compassion towards one another (Waring & Kelly, 2019). Same as for self-efficacy, it is important to gather more within-person data to conclude about people's daily self-compassion levels and the relationship towards the trait-levels of individuals.

Self-efficacy and self-compassion

The most direct study connecting self-efficacy and self-compassion was conducted by Iskender (2009), who proved that trait self-efficacy was positively associated with trait self-compassion. This means, that someone who is high in trait self-efficacy is more likely to be high in self-compassion and vice versa. The study also found a connection between the three parts of self-compassion and self-efficacy, meaning that self-kindness, understanding of common humanity, and mindfulness had a positive correlation with self-efficacy. Furthermore, self-judgment, isolation, and over-identification have a negative relationship with self-efficacy. Based on these results, Iskender (2009) concluded that high self-compassionate people are aware of their competences and shortcomings in a more healthy and efficient manner. Thus, they are less likely to criticize and judge themselves based on their failures, but understand their mistakes and enhance their skills, rather than give up. In contrast, someone who is low in both self-efficacy and self-compassion, will more likely see themselves as a failure when encountering a mistake and withdraw from the challenging task, wherefore no increase in self-efficacy or self-

compassion will take place (Iskender, 2009). Hence, self-compassion improvement can diminish self-judgment, isolation, and over-identification and therefore, enhance self-efficacy (Iskender, 2009).

However, it is still unclear on how people high in self-compassion or self-efficacy behave in daily stress situations. Since studies have concluded that states fluctuate throughout a day, and are therefore, different than trait-levels (Curran & Bauer, 2011; Fleeson, 2001), further research should be added to the study of Iskender (2009). On the one hand, it could be assumed, that state-levels of self-compassion and self-efficacy show the same results as the trait levels, meaning that someone who is momentarily high in state self-efficacy, will also be high in state self-compassion and vice versa. This would indicate that people are kinder to themselves as soon as they perform well at a certain task but judgemental and critical as soon as they fail to accomplish the same task. However, the opposite could be true, which would indicate, that state levels of self-compassion are high whenever state levels of self-efficacy are low and vice versa. This theory is in line with studies by Neff et al. (2007) who have often described self-compassion as a buffer against negative moments. Thus, someone who is high in state self-compassion in moments of low self-efficacy, is more likely to understand their failures and be kind to themselves.

Current study

The goal of this study is to examine the association between trait and state self-compassion and self-efficacy. Therefore, this study explores the three different levels of trait-, average state- and state measurements of self-efficacy and self-compassion in individual's daily lives using the experience sampling method (ESM). With this method, it is possible to gather the participants' daily emotional states as they encounter feelings of self-efficacy and self-compassion every day. Here, the examination of the actual experience with moment-to-moment fluctuations of people's moods and thoughts can take place (Myin-Germeys et al., 2018). For the overall study, four hypotheses have been chosen to analyse trait-, average state- and state levels of the participants. First, this research assumes a positive association on the trait-level between self-efficacy and self-compassion, meaning, that someone who is high in trait self-efficacy is also more likely to be high in trait self-compassion and vice versa. The same association was already found by previous research, where trait self-efficacy and trait self-compassion have

shown a positive correlation (Iskender, 2009). In that regard, it can be understood that people high in self-efficacy and self-compassion can be kind towards themselves in challenging situations and use feedback for personal growth (Iskender, 2009).

1. *H1: The trait self-efficacy has a positive association with the trait of self-compassion.*

Further, traits and average states are supposedly associated, as researchers concluded that states vary but that the average level of a state should resemble the overall trait (Fleeson, 2001). Therefore, it can be expected, that someone who has higher average state levels, also has higher trait levels, while someone who has lower average state levels, also has lower trait levels.

2. *H2: The traits self-efficacy and self-compassion can be predicted by the average states self-efficacy and self-compassion, respectively.*

Studies have already found a link between trait and state self-compassion (Waring & Kelly, 2019), but no study was found that studied the link between trait and state self-efficacy. In general, it can be expected that there will be variation in someone's daily self-efficacy and self-compassion levels as states fluctuate depending on the situations, meaning, that someone will not always have high levels in both states all the time. Still, someone who has an average high state-level of self-efficacy can also be assumed to have an average high state-level of self-compassion. Same as with the trait-level, someone who is more likely to be self-compassion on a daily basis, will also be more self-efficient, as they are kinder to themselves in challenging situations.

3. *H3: The average state self-efficacy has a positive association with the average state self-compassion.*

Finally, this study is one of the first to look at the association of state-levels of self-efficacy and self-compassion in individuals' daily lives. Thus, individual cases will be explored in regard to their state levels, to analyse the overall fluctuations and observe any individual patterns of self-efficacy and self-compassion to each other. Further, this study will analyse self-efficacy and self-compassion on the between-person and within-person level to examine whether the states of self-efficacy and self-compassion are more stable, or more fluctuating over time. When looking at the state levels, it is yet unclear whether the association between state self-efficacy and state self-compassion is more likely to be positive or negative. Thus, studies have concluded, that it very likely that people feel high in self-compassion when they succeed in a task, while they also assumed self-compassion to be high whenever people have failed a task. This study assumes both, a positive correlation on the between-person level and a negative correlation on the within-

person level. Thus, it will be examined whether state self-efficacy might be negatively associated on the state-level of self-compassion (within-person effect), as the later could determine how kind and open someone is towards their mistakes and enhance their skills in the end. State self-compassion is assumed to be working as a buffer whenever state self-efficacy levels are low. Further, state self-efficacy might be positively correlated with average self-compassion (between-person effect), as someone who succeeds more often during each day, is more likely to be kinder towards themselves. In contrast, someone who experiences many failures each day, could be more judgmental towards themselves on average.

4. *H4: State self-efficacy is negatively associated with state self-compassion (within-person) and positively with average state self-compassion (between-person).*

Methods

Design

The current study was part of a larger research and the data was collected previously by other students. This study applied the experience sampling method (ESM) with a structured, repeated-measure questionnaire and a time-contingent design to measure state self-efficacy and state self-compassion. The Ethics Committee of the Faculty of Behavioural, Management and Social Sciences (BMS) of the University of Twente approved this study (request no. 200382). The data collection took place during April 2020. Participation was voluntary, and participants were asked to give their consent before they had the option to begin with the surveys.

Participants

For this study, only participants were included who (1) were students, (2) were above the age of 18, (3) master the English language, and (4) are in possession of a mobile phone with wireless connection to have access to the Ethica application. Altogether, 43 people signed up to participate. Out of those, 13 participants had a response rate below 50% wherefore their data points were excluded from this study. Thus, the final study contained a sample of 30 students. Participant's characteristics can be described as half male (50%) and half female (50%). The age range was between 18 to 35 years old (M_{age} = 22.6, SD_{age}=3.82). The majority of participants identified as Dutch (43.3%), followed by German (30%), and other nationalities (26.7%).

The study used convenience sampling to gather participants, mostly done by communication via smartphone text messages between researchers and participants. Thus, friends and colleagues were asked to participate. Also, participants were able to join the study through the SONA (subject pool software) system derived from the University of Twente with the reward of 0.25 course credits. Other participants that did not join via SONA did not receive any rewards.

Materials

Online Research Platform Ethica

Ethica is a research platform that can be utilised as a web application or downloaded as a mobile application on Android and iOS devices (https://ethicadata.com/). The application enables the observation and collection of the real-time process of data collection by the participants as they finish the study. This study used version 153 of the smartphone application. Researchers can use Ethica to conduct a study with a variety of survey possibilities and by participants to take part in a study. After publishing the complete survey, the application gave an identification code and a web link, with which participants could join the survey.

Ethica enables the function to trigger surveys on various days several times each day. Each time a questionnaire is prompted, the participants get a pop-up notification on their mobile phones that reminds them to complete a questionnaire. Adding to this, it is possible to set reminders so participants will not forget to complete the questionnaires during their day's other stressors. Furthermore, the researchers' setting of expiration dates for each questionnaire ensures that measurements occur during planned time frames. At last, the data points of the questionnaire were saved and downloaded by the application.

Trait Questionnaires

The whole survey consisted of four trait questionnaires and one state questionnaire derived from the four trait questionnaires. The trait questionnaires were the Self-Compassion Scale-Short Form (SCS-SF), the Grit Scale for Children and Adults (GSCA), the Cognitive Fusion Questionnaire (CFQ) and New General Self-Efficacy Scale (NGSE). For this study, only the NGSE and SCS-SF are of relevance.

New General Self-Efficacy Scale (NGSE). The NGSE measures self-efficacy with eight items (Appendix A) on a 5-point Likert-Scale ranging from one (strongly disagree) to five

(strongly agree) (Chen et al., 2001). The final self-efficacy scores range from a minimum of 8 (lowest self-efficacy) to a maximum of 40 (highest self-efficacy). The NGSE was found to have good psychometric properties. The NGSE was constructed to be different from the original General Self-Efficacy Scale (GSES) and was finally found to be more reliable and valid. The NGSE is not only more unidimensional, meaning that it measures only the construct of self-efficacy, but also measures state motivation. Thus, Chen and colleagues (2001) have found adequate test-retest reliability ($r = 0.90$) and internal consistency ($\alpha = 0.86$) and relatively high content validity for this scale in their sample. An acceptable internal consistency ($\alpha = 0.65$) of the NSGE could be obtained in this studies sample. As a result, NGSE is a good measure of both the trait of general self-efficacy and the state of specific self-efficacy (Chen & Gully, 2001).

Self-Compassion Scale- Short Form (SCS-SF). The Self-Compassion Scale-Short Form was created by Kristin Neff and comprises twelve items (Appendix B) (Raes et al., 2011). The questionnaire uses a five-point Likert Scale ranging from one (Almost Never) to five (Almost Always). The level of self-compassion can be determined using the total scores. Therefore, a low score ranges between scores 1.0 - 2.5, a moderate score ranges between scores 2.6 - 3.5, and a high score range between scores 3.6 - 5.0. The questionnaire's items can be divided into six categories, each category containing two items. Out of the six categories, three categories are positive (Self-Kindness, Common Humanity, and Mindfulness), and three categories are negative (Self-Judgement, Isolation and Over-Identification) (Raes et al., 2011). For this questionnaire, the negative item loadings (items 1, 4, 8, 9, 11 and 12) have to be reversed accordingly. The short-form, derived initially from the long-form, was tested by Raes and colleagues (2011) and showed a high correlation with the long-form ($r = 0.97$) and a high internal consistency ($\alpha = 0.86$) in their sample. The Cronbach's alpha of the SCS-SF for this study contained a good level of internal consistency ($\alpha = 0.77$) as well. Although the long-form was found to more reliably measure self-compassion, the short-form can measure the same construct in a less time-consuming manner (Raes et al., 2011). Thus, the SCS-SF was chosen as a valid and reliable questionnaire to measure self-compassion.

State Questionnaires

To measure self-efficacy and self-compassion as a state, two items from the NGSE scale and two items of the SCS-SF were chosen and altered. These items were picked based on their high factor loading and how well they could be changed according to the state conceptualisation

of self-efficacy and self-compassion. For the state questionnaires, participants selected to what extent they agreed on a 5-point Likert-Scale varying from one (strongly disagree) to five (strongly agree) was used. The state questionnaires and their details can be found in Table 1.

Reliability and Validity of the NSGE and SCS-SF

To analyse whether this study has similar reliability and validity results for the NGSE and SCS-SF with the gathered sample of 30 students, a person correlation analysis was conducted. First, testing reliability in the experiment sampling method is more challenging, as the study measures the momentary fluctuations of states, depending on different life situations. Therefore, differences between participants should remain over time (Csikszentmihalyi & Larson, 2014). Thus, to examine a better response consistency while using ESM, the data set was divided into the first and second part of the week and into odd and even numbers of the timepoints. A significant positive correlation for both the NSGE and SCS-SF scale was found for both parts of the week ($r = .43$, $p = .001$ & $r = .83$, $p < .001$) and for the even and odd numbers of the timepoints ($r = .79$, $p = .001$ & $r = .85$, $p < .001$). Further, the Pearson correlation analysis between the NGSE and the state self-efficacy (PM) and between the SCS-SF and the state self-compassion (PM) showed no correlation ($r = .025$, $p = .897$ & $r = -.01$, $p = .951$). Thus, it can be assumed that participants scoring high in the trait are not, at the same time, scoring high in the average state scores.

Table 1

List of modified state questions

Scale	Trait question	Factor loading	Modified sate question	Correlation
NSGE	4. I believe I can succeed at most any endeavour to which I set my mind.	0.69	Right now, I believe I can succeed in my current task, if I set my mind to it.	Positively correlated with self-efficacy

NSGE	6. I am confident that I can perform effectively on many different tasks.	0.75	Right now, I don't feel confident in my ability to effectively accomplish my current task.	Negatively correlated with self-efficacy
SFS-SF	10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people. (common humanity)	0.92	Any feelings of inadequacy I experience right now, are shared by most people.	Positively correlated with self-compassion
SFS-SF	6. When I'm going through a very hard time, I give myself the caring and tenderness I need. (self-kindness)		Right now, I am giving myself the caring and tenderness I need towards my negative feelings.	Positively correlated with self-compassion

Note. The left to right column contains a) the corresponding trait questionnaires the modified state items are accustomed from, b) the trait question they are based on, c) the factor loading of the original trait question d) revised statement utilized as state question, and e) the expected correlation of the modified item with its relating construct.

Procedure

While establishing the study on Ethica, each questionnaire was tested and accustomed to the researchers' smartphone to ensure user interference is comprehensible and maintain a straightforward design. A two-day pilot study was led by two participants who examined the questionnaires' functionality, the response functions, the pop-up notifications and the user interfaces.

This study lasted over a time of nine days. On the first day, participants could enter the survey and ensure they were prepared for the following days. Therefore, they had to join the study via SONA or through the researchers directly. The participants were then asked to download the Ethica application on their mobile phone and enter the study code to receive the surveys. The Ethica study code was provided by SONA or by the researchers. Subsequently, the first page would show the sign-up information and an introduction to the study (Appendix C.1). After reading the details, participants had to approve the consent form to ensure they agreed to the studies requirements (Appendix C.2).

On the first day, participants were asked to fill out their demographic information and allow the pop-up notification for the application to be reminded to complete the daily surveys. Further information on how to turn on the pop-up notification (depending on iOS or Android usage) was provided to the participants. After participants followed these steps, both trait questionnaires of the SCS-SF and the NGSE were provided on the screen. Both questionnaires were measured first to gather general information on the average trait level of each participant and to prevent the possible manipulation of the daily questionnaires on participants' answers on the trait level. Therefore, the state questionnaires will be filled out on the next day. After completing the trait questionnaire, participants were informed to wait for further instructions on the next day.

For the state measurements, three daily state questionnaires for a total of eight days were used. Advocates of ESM opt for a minimum application of one week to gather a representative sample of participants' daily experiences (Van Berkel, Ferreira & Kostakos, 2017). Further, research has concluded that an amount of three to five daily questionnaires should be used as a right balance between gathering enough varied data and needlessly asking for people's time and attention (Van Berkel et al., 2017). Since this study's participants consisted of university students, three daily questionnaires were an excellent amount to capture people's state self-efficacy and state self-compassion levels. This is also in line with other studies that used the same approach and showed promising results (Pychyl et al., 2000). In this study, the participants were repeatedly asked to fill out the four state questions from the second until the ninth day. The 'daily state survey' consisted of two self-compassion state question and two self-efficacy state questions (Appendix C.3). Those ESM questions were triggered by three different timeframes that can be divided into the three-day periods of the morning (9:00 to 10:30), afternoon (14:00 to

16:30) and evening (20:00 to 21:30) for a total of eight days. For instance, a morning survey could be triggered by 9:30 am, wherefore participants have until 11 am to fill out the questionnaire. In general, one survey will provide three pop-up notifications every 30 minutes as a reminder that a new questionnaire is available and is ready to be completed (Appendix C.4).

The random time frames of 90 minutes were administered to avoid habituation of the participants and would expire after the time window to ensure the data's sequential order. Consequently, participants could not fill out the questionnaires by the end of the day if they had forgotten to do so during a suitable time frame. In those 90 minutes, three pop-up notifications each 30 minutes apart would remind the participants to fill out the next questionnaire. A recent study on utilising ESM using smartphones recommends these signal reminders, to lessen participants' troubles to remind themselves of the questionnaires (Van Berkel et al., 2017).

Every question needs to be answered before the application will open the next one. A 'thank you' note was given to participants at the end of each state questionnaire to motivate and ensure their following surveys' response rate. All through the study, the participation response rate was checked. This study's researchers reached out to those participants with no responses for numerous days to possibly increase their encouragement and cooperation.
On the last day (day 9), the researchers expressed their gratitude to the participants for their commitment.

Data Analysis Strategy

Data Preparation

IBM SPSS Statistics (version 26) was used to examine the data points from Ethica. All participants who did not respond above 50% of the daily state questionnaires were excluded from the study, as this was found to be an acceptable cut-off point among ESM research (Conner & Lehman, 2012).

Descriptive statistics

The participants' demographic information has been investigated in terms of mean (*M*) scores, standard deviations (*SD*), percentage scores for 'gender' and 'nationality' and minimum and maximum values for 'age'. For the self-efficacy and self-compassion scores, frequency tables were calculated with the mean (*M*), standard deviation (*SD*), maximum and minimum for both trait and state scores

Inferential statistics

First, to account for the several data collection points for each participant and prevent errors of inference, between-person and within-person effects need to be disaggregated into one model (Curran and Bauer, 2011). Therefore, person mean (PM) scores were calculated for self-efficacy and self-compassion for the eight days per participant. PM scores can be utilised to inspect the between-person associations (state self-efficacy with state self-compassion) and indicate the average state level of self-efficacy and state self-compassion. Then, the person mean-centred scores (PMC) were calculated by subtracting the PM of self-efficacy and self-compassion from the state scores. PMC scores can be utilised to examine within-person associations (fluctuation of state self-efficacy and self-compassion), and therefore, indicate the momentary difference in state self-efficacy and self-compassion from the average state level (PM scores) at each timepoint for each participant. With this, it can be observed how much the states deviate from the PM score at different moments. Finally, z-scores have to be calculated for both PM scores and PMC scores to obtain standardised coefficient for the LMM analysis (Curran & Bauer, 2011).

Thus, the Linear Mixed Model will be used for H4, to examine the association between state self-efficacy and state self-compassion on the between-person and within-person level. The LMM applied an autoregressive covariance structure (AR1) to consider data dependency and missing measurement points (Curran & Bauer, 2011). Therefore, the PMC scores of state self-efficacy were used as the dependent variable and the PM scores of the state self-compassion (between-person) and the PMC scores of the state self-compassion (within-person) as the fixed independent variable. Further, a spearman rank-order correlation was used to analyse the association between trait self-efficacy and trait self-compassion (H1), and average state self-efficacy and average state self-compassion (H3). To ensure the unnormal distribution of the data, a Shapiro-Wilcoxon analysis was conducted on the data of the trait self-efficacy and self-compassion and on the PM scores of self-efficacy and self-compassion. Finally, to examine whether the average state of self-efficacy and self-compassion predict their trait-levels (H2), a linear regression analysis was used. First, to ensure linearity of the data, a scatterplot with a superimposed regression line using average state self-efficacy and self-compassion against trait self-efficacy and self-compassion was used. Following, the average state level was applied as the independent variable, while the trait-level was used as the dependent variable. In the end, three

individual cases will be analysed to examine the overall state level of self-efficacy and self-compassion in more detail. With a closer look towards the mean scores and graphic visualisation, the relationship between state-levels can be explained. All three participants were chosen based on their mean trait or state scores, wherefore one participant with the highest mean trait scores, one participant with the lowest mean trait scores and one participant with a high difference between trait and state mean scores were picked.

Result

Descriptive Statistics

Table 1 exhibits the mean, standard deviation, minimum and maximum scores of trait and state self-efficacy and self-compassion for the 30 participants. The average response rate of this study was 76.94%.

Table 2

Means (M), Standard Deviation (SD), Minimum and Maximum Scores of Trait Self-Efficacy and Self-Compassion and State Self-Efficacy and Self-Compassion.

Variables	M	SD	Minimum (Min of Scale)	Maximum (Max of Scale)
Trait Self-Efficacy	30.64	3.26	20 (8)	36 (40)
Trait Self-Compassion	38.63	7.11	23 (12)	52 (60)
State Self-Efficacy	3.86	.742	1 (1)	5 (5)
State Self-Compassion	3.45	.711	1 (1)	5 (5)

Note. N=30

Inferential Statistics

The Association between Trait Self-Efficacy and Trait Self-Compassion

A Shapiro-Wilk test found the data for the trait self-compassion ($W(30) = .961$, $p = .338$), state self-efficacy ($W(30) = .954$, $p = .212$) and state self-compassion ($W(30) = .984$, $p = .928$) not normally distributed. Only trait self-efficacy was significantly normally distributed ($W(30) = .895$, $p = .006$). Therefore, a Spearman rank-order correlation was used to assess the association between both traits. Here, the results showed no significant correlation between trait self-efficacy and trait self-compassion ($r = .273$, $p < .144$). This indicated that someone high in trait self-efficacy is not necessarily high in trait self-compassion as well.

The Association between Traits and Average States

Next, a linear regression analysis was used to examine the relationship between the average state and the trait. The scatterplot of the self-efficacy and self-compassion data showed good linearity between the variables of average state and trait-level. Thus, the results for self-efficacy have shown that the average state does not significantly predict the trait-level $F(1,30) = .017$, $p = .897$ and the average state only predicts the trait level by $R^2 = 0.1\%$. The difference between the average state and trait of self-efficacy can further be examined in Figure 1. Especially people with lower trait self-efficacy, perceived themselves to be high in state over the period of one week (Participant 7, 29, 23, 2, 10). In the end, their average state level is higher than for the people who assume to have a high trait in self-efficacy and should have therefore obtained a higher average state level as well. For these people, their average state of self-efficacy is sometimes even lower (Participant 5, 11, 18, 20).

Next, the results of the linear regression have shown that the average state of self-compassion significantly predicts the trait of self-compassion $F(1,30) = 4.36$, $p = .046$, however the prediction only accounts for $R^2 = 13.5\%$ in the sample. Figure 2 shows the difference between the trait and average state of self-compassion for each participant. Again, similar results can be seen where people with the lowest trait scores obtain relatively high average state scores (Participants 15, 7, 22, 19) and people with higher trait levels scored relatively lower in their average state self-compassion (Participants 23, 16, 17, 14), although not as much as for self-efficacy.

Figure 1

Mean Scores for Trait and State (PM) Self-Efficacy for each participant, arranged from lowest to highest Mean Trait Score.

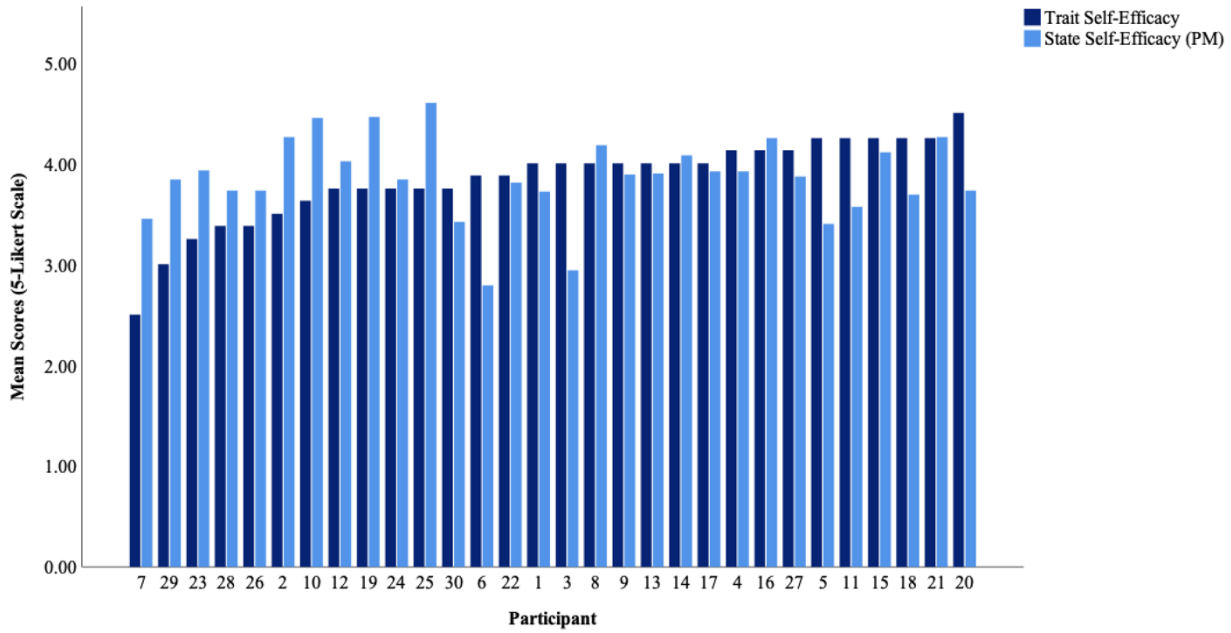
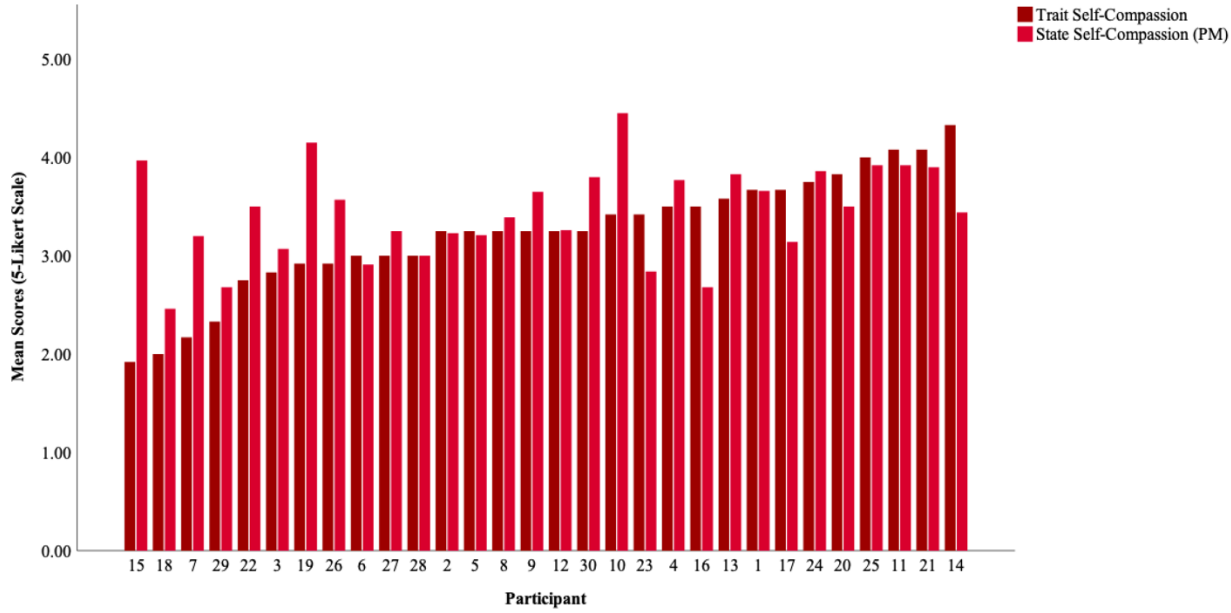


Figure 2

Mean Scores for Trait and State (PM) Self-Compassion for each participant, arranged from lowest to highest Mean Trait Score.



The Association between State Self-Efficacy and State Self-Compassion

Again, a Spearman rank-order correlation was used to analyse the association between the average state of self-efficacy and the average state of self-compassion. The results have shown a significant, moderate positive correlation between both average states ($r = .365$, $p < .048$), indicating that someone high in average state self-efficacy is also high at average state self-compassion and vice versa.

Further, a Linear mixed model with average state self-efficacy (PM) and average state compassion (PM) (between-person) and on state self-efficacy levels (PM-centred) at specific time points (within-person) were calculated to analyse the association. The results showed that average state self-compassion (PM) is a significant predictor of state self-efficacy ($F(1, 118.84) = 13.43$, $p = .001$) with a weak positive association on the between-person level ($\beta = .22$, SE = .06, $p = .001$, 95% CI [0.1, 0.34]). Further, state self-compassion (PM-centred) was also found to be a significant predictor of state self-efficacy ($F(1, 473.6) = 6.31$, $p = .012$) with a weak positive association on the within-person level ($\beta = .09$, SE = .04, $p = .012$, 95% CI [0.02, 0.16]). However, the confidence interval indicates, that there is no significant difference between the between-person level and within-person level, meaning that state self-efficacy cannot better be predicted by neither the average state of self-compassion nor the momentary fluctuation of self-compassion.

Individual Cases

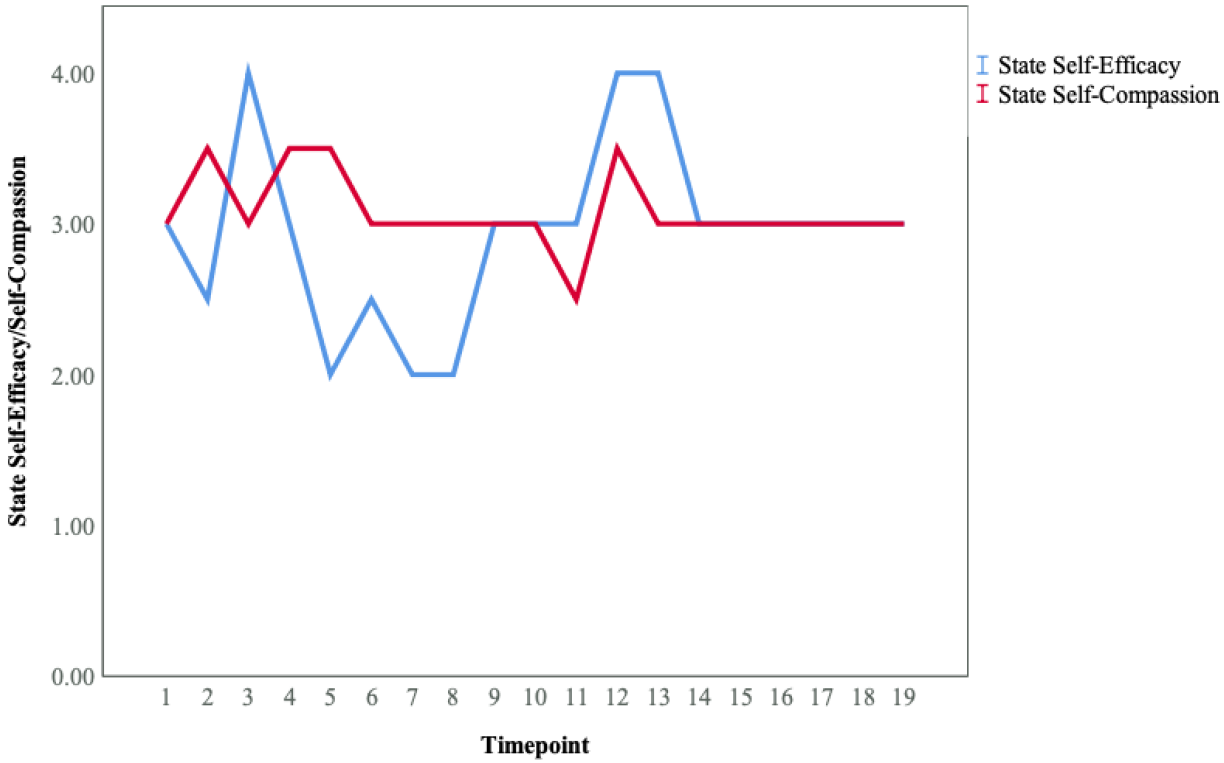
To analyse the difference between trait and state levels of self-efficacy and self-compassion further, three individual case analysis on three different score levels have been examined. Therefore, individual mean scores of both trait and state constructs, as well as graphs showing state self-efficacy and self-compassion will be compared.

Participant 3. Participant 3 scored relatively low on both states and trait self-compassion compared to all other participants. Further, there is a difference between trait self-efficacy and self-compassion, indicating that this person has a high level of self-efficacy (4.00) but a relatively moderate level of trait self-compassion (2.83). Further, Participant 3 scored below average on state self-efficacy (2.94) and below average on state self-compassion (3.07). Over the time period of one week, the average state of self-compassion is relatively stable, while quite some fluctuation can be seen for the self-efficacy state scores. The low level of state self-efficacy can especially be seen at timepoint 2 and 4 until 8 while a rise of self-efficacy is visible after

timepoint 8. Although some fluctuations in self-efficacy persist, there is no substantial fluctuation in state self-compassion and therefore, no evidence of buffering against low self-efficacy levels. Following, no fluctuations at all between both states can be seen for the last two days of the survey, where both state self-efficacy and state self-compassion are in line with each other (timepoint 14, 15, 16, 17, 18 and 19).

Figure 3

Average State Self-Efficacy and Self-Compassion Scores of Participant 3 in Daily State Questionnaires

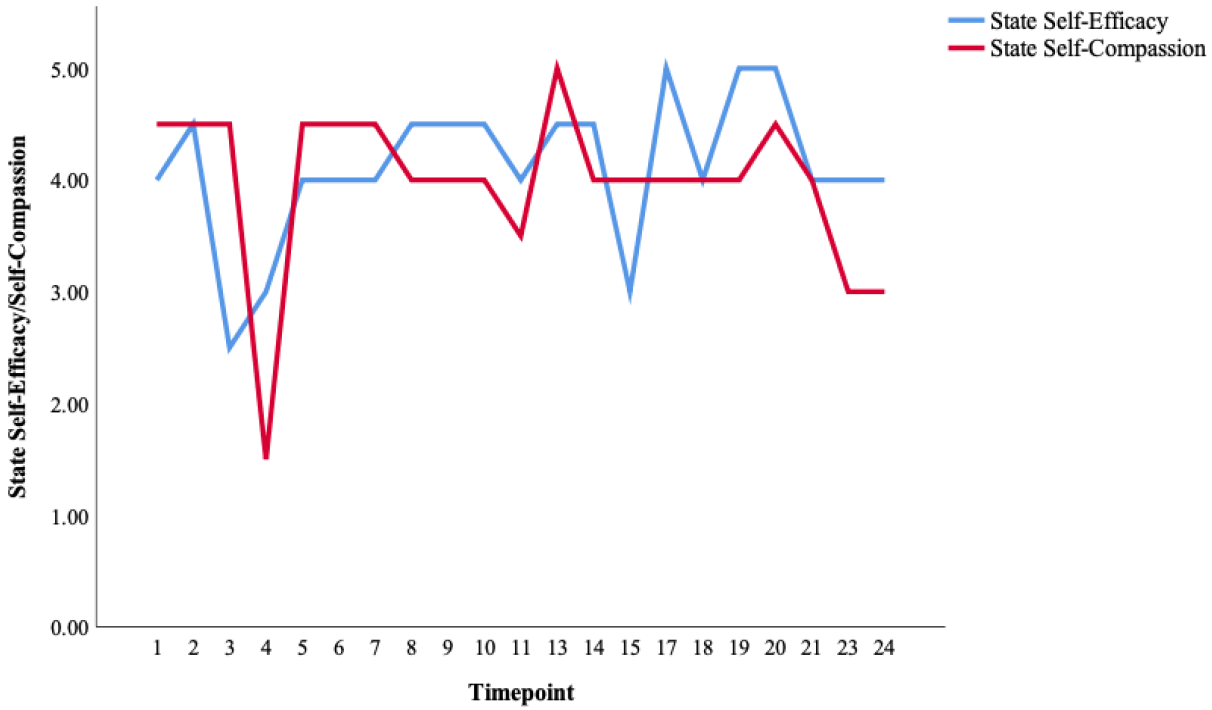


Participant 14. Participant 14 scored relatively high in both trait and state constructs and showed a substantial amount of fluctuation in the state self-efficacy and self-compassion over the one week. The participant has high levels of trait self-efficacy (4.00) and trait self-compassion (4.33). Additionally, the person scored high on state self-efficacy (4.08) and moderately on self-compassion (3.44). Thus, both trait and state of self-efficacy are high, while state self-compassion is perceived lower than trait self-compassion. Interestingly, this person shows some fluctuation over the one week, where state self-efficacy and state self-compassion rise and fall both at the same and separate timepoints. For example, timepoint 2 and 3 show a decline of self-efficacy followed by self-compassion and a rise of self-efficacy, again, followed by self-

compassion (timepoint 4, 5, and 6). However, after timepoint 13, state self-compassion stays stable while state self-efficacy fluctuates between each timepoint.

Figure 4

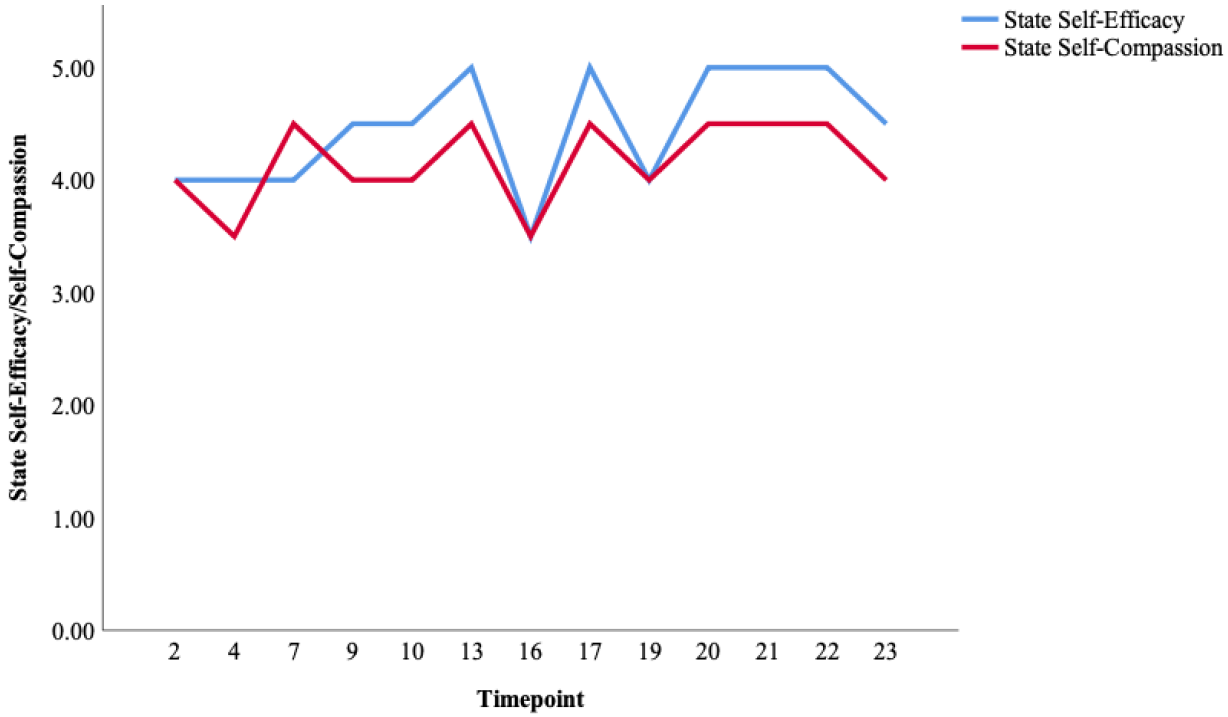
Average State Self-Efficacy and Self-Compassion Scores of Participant 14 in Daily State Questionnaires



Participant 19. Participant 19 scored relatively high on both states with relatively minor fluctuations over one week. However, there is a difference between the mean trait and state scored. Therefore, this person scores a high level on trait self-efficacy (3.75) and state self-efficacy (4.46) and a moderate level on self-compassion (2.92) but high level on state self-compassion (4.15). Interestingly, the participant has a relatively low self-compassion score but perceives themselves as rather high in their daily state self-compassion. Also, this person shows only a modest level of daily fluctuations, where state levels are varying mostly between scale 4 and 5. Further, state self-efficacy and self-compassion go up and down, respectively (timepoints 9 until 23).

Figure 5

Average State Self-Efficacy/Self-Compassion Scores of Participant 19 in Daily State Questionnaire



Discussion

The goal of this research was to investigate the association between trait and state self-efficacy and self-compassion in people's daily life. First, the results showed no significant relationship between trait self-efficacy and self-compassion (H1), wherefore someone who is high in trait self-efficacy, does not necessarily have to be high in trait self-compassion and vice versa. Further, the results indicated a significant relationship between average state self-compassion and trait self-compassion, but not between average state self-efficacy and trait self-efficacy (H2). Thus, the average state level of self-efficacy does not necessarily describe the overall trait. However, the average state level of self-compassion does describe the overall trait of self-compassion to a certain degree. For the third hypothesis, a positive relationship was found between the average state level of self-efficacy and average state self-compassion, meaning that someone who reports a relatively high average self-efficacy state for one week, will also report a somewhat higher average self-compassionate state. For both the between-person and within-

person level, weak, positive associations between state self-efficacy and self-compassion were found (H4). Thus, someone who is high on average state self-compassion, is also more likely to record higher state self-efficacy scores over the one-week period (between-person effect). At the same time, someone who is momentarily high on state self-compassion, is also more inclined to be higher on state self-efficacy (within-person effect). However, the results do not support the assumption that there was a difference between self-efficacy and self-compassion on the between-person and within-person level, indicating that momentary state self-efficacy is not better predicted by neither the average state nor the state of self-compassion.

Interpretation of Results

Trait Self-Efficacy and Trait Self-Compassion

The results of this study have shown that trait self-efficacy and trait self-compassion were not related in the current sample, indicating someone high in self-efficacy is not necessarily high in self-compassion as well. This would imply that someone who is believing in their skills and capacity to accomplish a task successfully, is not necessarily being kind and understanding of their difficult situation and vice versa. This finding is contrary to the results of Iskender (2009), who found that both traits have a weak but positive relationship. The difference between results could be explained with the different questionnaires used to measure both constructs. Thus, Iskender (2009) used the Self-Compassion Scale (SCS) and the Self-Efficacy Subscale of the Motivated Strategies for Learning Questionnaire (MSLQ). First, the SCS contains 26 items and was found to have a higher validity to the questionnaire used in this study. Second, the MSLQ is more closely tailored towards learning abilities and academic motivation (Pintrich, 1991) and not the construct of general and specific self-efficacy that is based on Bandura (2010). However, Iskender's study (2009) contained a total of 390 participants, wherefore his research contained much more data points for self-efficacy and self-compassion on the trait level. In contrast, this study collected data points from 30 participants, which is a rather small sample size, especially when compared to Iskender's study (2009).

Traits and Average States

Further, the trait and the average states are only partly related, wherefore it cannot be fully concluded that average states describe the actual trait. Especially when viewing the Figure 1 of the association between average state to the trait level of self-efficacy, the same results can

be seen. This is not in line with the overall findings of Fleeson (2001), who argues that states fluctuate but that the average state should show the trait level of an individual. Thus, the average state of self-efficacy does not describe the trait-level of self-efficacy, showing that the state and trait level are different. As already mentioned, no study was found that analysed the relationship between the trait and the state level. Researchers so far, have distinguished between specific and generalised self-efficacy (Shelton, 1990). Generalised self-efficacy was meant to describe the overall ability of a person in a variety of situations (Gardner and Pierce, 2011), whereas specific self-efficacy should explain the fluctuation of a person's ability depending on the task, the motivation, and the achievement in one specific situation (Chen et al., 2004). The results of this study indicate that a person can believe their overall skills to be rather high in a lot of different situations, while the same person might not perceive the same adequate skills most of the time in a certain moment. Also, someone can also perceive themselves to make more mistakes while performing in general but find out to be rather skilled during the day in most their performances.

In contrast to this, the average state and trait-level of self-compassion showed a very small prediction in the sample of this study. Therefore, the results are in line with the hypothesis and the studies of Fleeson (2001) and Waring and Kelly (2019). Overall, the results indicate that someone who is relatively high or low in their average state levels of self-compassion, is also high or low on the trait level. With these results, it could be assumed, that people who perceive themselves to be self-compassionate in their daily life, also believe to be relatively self-compassionate during their whole lifetime. Since this study did not include the third construct of 'mindfulness' into the state questionnaire, it can only be assumed that the low level of prediction is due to this missing construct, as the whole concept of self-compassion was not fully measured on the state-level. This study only included 'awareness of common humanity' and 'self-kindness' into the state questionnaire. Both studies of Neff and Vonk (2009) and Neff et al. (2021), stressed that state self-compassion is derived from all three concepts of 'self-kindness', 'awareness of common humanity' and 'mindfulness'.

The study's results on the average state and trait are still different from the research conducted by Chen et al. (2001) and Waring and Kelly (2019), who have found strong significant associations between the average state and trait of both self-efficacy and self-compassion. This might be due to the extended time period of three weeks, where a more detailed analysis of state fluctuations could take place. Thus, trait data could be explained by the

average state when collecting data points over several weeks. However, it can further be assumed, that the gathering of an individual's state data in one week cannot accurately describe the trait data. Fleeson (2001) discusses the importance of collecting the whole distribution of behaviour to describe the trait of a person. Therefore, the overall trait is more thought of the general experiences of an individual in his or her whole lifetime (Conner & Bauer, 2012), wherefore an average state measured in one week might not be a significant comparison. Thus, most studies that have compared trait and state levels have collected measures over three weeks, where multiple scenarios can take place for the participants (Chen et al., 2004; Fleeson, 2001; Waring & Kelly, 2019). A recent study by Conner and Barrett (2012) goes even further and concludes, that trait reports should not be used to explain actual experiences, or states. This is because there is a difference between the remembering self and the experiencing self. In order to collect trait measures, people have to remember their behaviour over a longer period of time, where biases can occur. Thus, people seem to have another perception or memory on how self-efficacious and self-compassion they are when asked in retrospective, as was the case for the trait-questionnaire. However, when they have to indicate their current emotions for several days, their actual level seems to be different than their assumed trait-level. Thus, this study adds to the theory of Conner and Barrett (2012), where the results have shown as well, that individual's trait scores are not comparable with their average state scores.

State Self-Efficacy and State Self-Compassion

Concerning the daily state scores of the participants, the results have shown that the average state of self-efficacy and self-compassion are related, which means that someone with a higher average state score of self-efficacy is more likely to have a higher average score of self-compassion and vice versa. In contrast, someone with a lower average state score in self-efficacy is also more likely to have lower average state scores of self-compassions.

For the between-person and within-person analysis, the results have shown weak positive associations between the state self-efficacy and state self-compassion. However, both average state self-compassion and momentary state self-compassion are only weak predictors of momentary level of self-efficacy. Further, no significant difference between the between-person and within-person level for state self-efficacy was found. Thus, when considering the association on the between-person level, the momentary increase or decrease of self-efficacy is weakly predicted by the overall high or low level of the average state of self-compassion. However, the

same is true for the association on the within-person level, where the momentary fluctuation of high or low levels of self-efficacy are weakly predicted by the momentary fluctuation of self-compassion.

These results on the within-person level are not in line with the hypothesis and the findings of Neff and colleagues (2007) who have concluded that self-compassion is working as a buffer in situations when someone does not feel capable to achieve something. Here, all three parts of self-compassion, namely kindness, common humanity and mindfulness, have to come into play. Thus, a person has to be especially kind to themselves when faced with difficulties, while understanding that mistakes are human nature and common for everyone. As a result, they can further approach the challenging situation with ease, instead of self-judgement (Neff et al., 2007). Thus, whenever someone reports a momentary low level of self-efficacy, a high momentary level of self-compassion should arise to counteract the insecurities and as a result, establish a higher level of self-efficacy. However, the results of the within-person level this study have shown, that someone who is momentarily high in self-efficacy is also more likely to be momentarily high in self-compassion, while someone who is low in self-efficacy, is also low in self-compassion. Thus, someone is kinder and loving towards oneself when they have found their performance to be successful, while they are judgemental and self-criticising when failing a task. When looking at the between-person level, the results are in line with the hypothesis, that the average state level of self-compassion does predict the momentary level of self-efficacy. Thus, someone who is on average more self-compassionate, will also experience more higher levels of self-efficacy during their day, as it is more likely for someone who is kinder, understanding, and non-judgemental to succeed in their daily tasks. On the other hand, someone who is less self-compassionate on average, will also be more self-critical and identify with their failures, which is more likely to lead to less successful performances during the day.

In their study on self-compassion, Trompetter, de Kleine and Bohlmeijer (2017) have found similar results for the mental pathological illness and mental health of people, where self-compassion is high in mentally healthy people, but low in mentally ill people. Thus, someone who is mentally stable is also more kind towards themselves. On the other hand, people that are suffering from depression or other mental illnesses had impaired self-compassionate abilities, indicating that the negative and narrowed thinking makes it unlikely to experience the kind and broadened view of self-compassion (Trompetter et al., 2017). The same can be true for the

individual's level of self-efficacy, where people that are already high in self-efficacy are more likely to be kinder towards themselves as they often succeed in life. Further, individuals that experience low levels of self-efficacy, also feel less self-compassionate as they are used to self-criticism and judgements towards their perceived poor performances. This can also be observed in the individual cases, where participants scored relatively high on state self-efficacy and self-compassion during the period of one week.

Strengths, Limitations and Recommendation

A major strength of the study is the analysis of same constructs on a trait and state- level. Thus, this study is the first that compares trait and state self-efficacy and trait and state self-compassion in students' natural environment. Both positive characteristics are rather new in the field of psychology but have already shown promising results for enhancing a person's well-being. As many researchers have opted to enhance the importance of well-being into psychological treatments, instead of only treating mental illness, more positive characteristics should be placed in the foreground of studies (Bohlmeijer & Westerhof, 2020). Thus, by understanding more about both constructs in people's everyday life, a lot can be done for their overall well-being and mental health. Another strength of the research is the setup concerning the experience sampling method. With assistance of the Ethica application, participants had the option to participate in this study from home without requiring a lot of effort to join. Further, it was possible to measure their natural states in their regular surroundings without any biasing's by lab settings. Thus, the ESM methodology enhances the ecological and external validity of the research (Verhagen et al., 2016), by inspecting participants' experience as they naturally occur and enhancing the generalisability of the research's discoveries to the real-life setting. Thus, the research setup can be displayed for its unobtrusiveness. Additionally, ESM permitted the examination of between-person and within-person association. Finally, another strong point is the great psychometric properties of the NGSE and SCS-SF questionnaire, which are high in reliability and validity. Hence, the measurements of self-efficacy and self-compassion are accurate and stable.

However, also some limitations concerning the outcomes of the study exist. First, the validity of the state questionnaires was not found to be significant. The items used to obtain state self-compassion only incorporated the components of self-kindness and common humanity, while ignoring the component of mindfulness which might have influenced the outcomes (Neff et al., 2021). A recommendation for future research would be to include a more suitable state questionnaire that includes the construct of mindfulness as well, to ensure a higher validity for the state measure. Only recently, did Neff and colleagues (2021) validate the new State Self-Compassion Scale, which could be used as a suitable state measure for future research. Another measurement limitation is the ceiling effect that emerged from the trait scores of self-efficacy. In general, the whole sample achieved a relatively high mean score of 30.64 (see Table 2) out of a total of 36. A ceiling effect is said to happen when a high number of participants in a study obtain a relative high score on a variable (Austin & Brunner, 2003). This effect makes discrimination between the high scores impossible. Since the internal consistency of the NGSE in this study was found to be high, a response bias could be a possible reason for the ceiling effect in this study. Response bias includes the failure of participants to react to a measure appropriately as they are more likely to believe the precise response will be seen as negative (Andrew et al., 2011). A research conducted with students about self-efficacy variables might include the subjects questioning their overall abilities as students, wherefore they will rate themselves higher as is actually true. Their response bias is in believing that the desirable response is the maximum score. The part of reaction inclination in causing roof impacts is plainly seen through the case of overview respondents accepting the attractive reaction to be the most extreme reportable worth, bringing about a bunching of information focuses (Andrew et al., 2011; Austin & Brunner, 2003). Since ceiling effects are misleading in data interpretation, future studies should prevent this from happening by utilizing the instrument and procedure used in this study. A third limitation is that a few participants got fewer daily prompts, bringing about lower response rates, because of technical issues with the Ethica application, which might have influenced the validity of this study (Van Berkel et al., 2017). This is because the ecological validity of ESM is derived from selecting real-life measures over a longer period of time, however, the lack of these data points due to technical issues can be a disadvantage for the validity (Scollon, Prieto, & Diener, 2009). Thus, a pilot test could be conducted in future studies to avert the occurrence of technical issues and decrease the ecological validity. Another

limitation is that the experience sampling method cannot conclude about causalities, meaning that confounding variables might account for the outcomes (Myin-Germeys et al., 2018). Thus, more exploration on the experimental nature is needed to investigate the processes that may influence the variances of states and the relationship between self-efficacy and self-compassion. Also, future research could incorporate other context variables as well, for example, the perceived difficulty and liking of the task, which might determine the state level of self-efficacy and self-compassion in turn. Moreover, the rather short time frame used in this study can be criticised. A span of two to three weeks could capture more measurement points and provide a more detailed analysis for the association between self-efficacy and self-compassion (Van Berkel et al., 2017). Lastly, this study only contained of data points by 30 participants, which is a rather small sample size compared to other studies in this field (Chen et al., 2001; Iskender, 2009; Waring & Kelly, 2019). For example, Waring and Kelly (2019) collected 102 participants, Chen et al. (2001) selected 316 participants and Iskender (2009) obtained 390 participants. Thus, the sample size does not seem strong enough to conclude confidently on the association between self-efficacy and self-compassion on the trait- and state-level.

Conclusion

This study gives insights into the real-life association between self-efficacy and self-compassion on different individual levels. Thus, this research is one of the first to analyse both constructs on their state-level, as research on momentary measurements has only recently become of importance. This study has found a weak, but positive association between both constructs on the state-level, but no association on the trait-level, or between traits and average states. From this, it can be concluded, that someone who is momentarily self-efficacious, is also more likely to be self-compassionate at the same moment and on average. However, future studies should opt for a more time extended experience sampling study with the inclusion of a bigger sample size to analyse the association between trait- and state levels of self-efficacy and self-compassion.

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Appendices

Appendix A: New General Self-Efficacy Scale (NGSE)

1. I will be able to achieve most of the goals that I have set for myself.
2. When facing difficult tasks, I am certain that I will accomplish them.
3. In general, I think that I can obtain outcomes that are important to me.
4. I believe I can succeed at most any endeavor to which I set my mind.
5. I will be able to successfully overcome many challenges.
6. I am confident that I can perform effectively on many different tasks.
7. Compared to other people, I can do most tasks very well.
8. Even when things are tough, I can perform quite well.

Appendix B: Self-Compassion Scale- Short Form (SCS - SF)

1. When I fail at something important to me, I become consumed by feelings of inadequacy*.
2. I try to be understanding and patient towards those aspects of my personality I don't like.
3. When something painful happens, I try to take a balanced view of the situation.
4. When I'm feeling down, I tend to feel like most other people are probably happier than I am*.
5. I try to see my failings as part of the human condition.
6. When I'm going through a very hard time, I give myself the caring and tenderness I need.
7. When something upsets me, I try to keep my emotions in balance.
8. When I fail at something that's important to me, I tend to feel alone in my failure*.
9. When I'm feeling down, I tend to obsess and fixate on everything that's wrong*.
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
11. I'm disapproving and judgmental about my own flaws and inadequacies*.
12. I'm intolerant and impatient towards those aspects of my personality I don't like*.

*Items with reversed scoring.

Appendix C: Ethica sign up information

C.1 sign up information given to the participants before confirming to the study

Thank you very much for signing up for our study! Before you start, a short introduction will follow. The purpose of this study is to measure how you feel throughout the day. By using monitoring tools that help us to identify the daily fluctuations of constructs from mental health, we can obtain an insight into their dynamic interactions. This can then be applied to develop more personalized psychological interventions and therapies.

This study will run for about a week. On the first day we will start with a couple of questionnaires. These initial questionnaires need to be filled in only once and it shouldn't take more than 30 minutes. From the next day onward, you will receive notifications via ethica when you can answer a couple of questions throughout the day. That will happen three times per day - morning, afternoon and evening and it won't take more than 15 minutes per day. That will continue for 7 days until the end of the study. Please keep in mind you can opt-out of the study at any moment by simply not answering any questions or deleting ethica without needing to provide any reason.

We know people are quite occupied nowadays but we will ask you to fill in these daily questions as much as possible. For this purpose, we are giving you the possibility to fill it in for an hour after receiving a notification instead of immediately, afterwards it will expire and you won't be able to do it. Please, check occasionally if you have some activities to be done.

Additionally, we want to ask you to turn on the notification option for the Ethica app and to adjust the battery optimization settings which sometimes might intervene with the pop-up and sound notifications. We will provide you with some guidelines on how to do it if you don't know, they can be found in the overview of the study.

And that is it for today! **further information will be provided to you tomorrow in the app. Make sure to check your phone for details. We will send a notification via Ethica as well to remind you.**

Thank you again for joining. If you have any trouble setting up the app or have questions about the study at any point feel free to contact *Dimitar Seykov* or *Arya Arjomand* at:
d.seykov@student.utwente.nl
a.arjomand@student.utwente.nl

C.2 Consent form

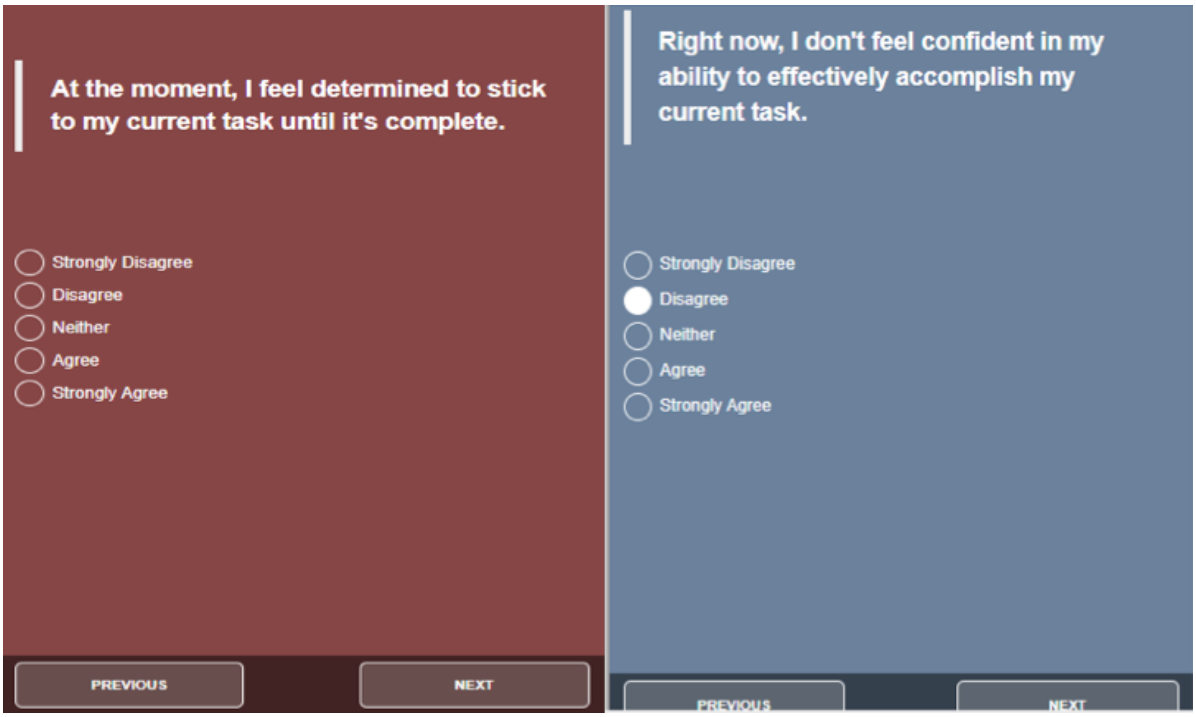
Your participation in this study is completely voluntary and all your responses are treated anonymously. None of the responses will be connected to identifying information and wouldn't be shared with third parties. Data will only be used for statistical analyses. However, you can withdraw from the study at any time! By simply stopping answering the daily questions without the need to give any reasons.

If you would like to have further information about the research, now or in the future, feel free to contact *Dimitar Seykov* or *Arya Arjomand* at:
d.seykov@student.utwente.nl,
a.arjomand@student.utwente.nl.

If you have any complaints about this research, please direct them to the secretary of the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente, Drs. L. Kamphuis-Blikman P.O. Box 217, 7500 AE Enschede (NL), telephone: +31 (0)53 489 3399; email: l.j.m.blikman@utwente.nl).

◯ I understand the above statement and agree to participate in the current study

C.3 example of daily state questionnaire provided via Ethica to the participants



C.4 notification settings on the Ethica website to set daily reminders as a researcher