**State Self-Compassion Dynamics: Evidence for the Bipolar Continuum Hypothesis**

# Abstract

**Objectives.** Self-compassion (SC) is a crucial topic in the current psychological research, particularly regarding its conceptual framework. Neff’s Bipolar Continuum Hypothesis (BCH) posits that compassionate self-responding (CS) and uncompassionate self-responding (UCS) exist on a continuum and are interrelated. Conversely, some researchers advocate for the independence of CS and UCS. This study aims to contribute to this debate by exploring the dynamic interplay between CS and UCS through the construct of state self-compassion, facilitating an examination of how situational factors influence these components in real-life contexts. **Method.** We conducted two longitudinal field studies over three months with 494 participants, utilizing Ecological Momentary Assessment (EMA) to collect weekly data. We investigated the impact of contextual factors, including immediate emotional states, the unpleasantness of recent events, and participants' capacity for decentering, on the CS and UCS components of state self-compassion. **Results.** Our findings indicate that various contextual factors affect CS and UCS inversely, providing support for the BCH. Momentary decentering influenced the relationship between CS and UCS. Negative affect emerged as a strong predictor, with higher levels associated with increased UCS and decreased CS. The unpleasantness of specific events had a relatively minor impact compared to decentering and negative affect. **Conclusions.** This study supports the BCH by showing that the CS and UCS components of self-compassion are inversely affected by immediate emotional experiences and broader contextual factors. Future research and clinical practice should prioritize strategies that specifically enhance the CS component of SC, taking into account the role of situational factors to promote well-being.

**Keywords:** self-compassion; ecological momentary assessment; contextual factors; emotion regulation; decentering; negative affect.

Self-compassion, widely discussed in contemporary psychological literature, refers to the practice of being kind and understanding toward oneself during moments of suffering or perceived inadequacy. The Self-Compassion Scale (SCS; Neff, 2003), the most commonly used tool for measuring this construct, has garnered over 8,689 citations on Google Scholar. Despite its widespread application, the exact nature of self-compassion remains a topic of ongoing debate. Central to this debate is Kristin Neff’s Bipolar Continuum Hypothesis (BCH), which posits that compassionate self-responding (CS) and uncompassionate self-responding (UCS) exist on a continuum rather than as separate constructs. The compassionate pole includes self-kindness, common humanity, and mindfulness, while the uncompassionate pole involves self-judgment, isolation, and over-identification. Neff asserts that an increase in CS naturally leads to a decrease in UCS, forming the basis of the SCS, which assesses both the supportive and hindering facets of self-compassion. She advocates using the SCS total score as a comprehensive measure, challenging the notion of separate effects of CS and UCS—a perspective she describes as a fallacy (Neff, 2022). Further supporting this view, Neff et al. (2021) demonstrated that the SCS captures a single global factor along with six subfactors, reinforcing the idea of a bipolar continuum.

However, the conceptualization of self-compassion is still debated. Some researchers, such as Muris, argue that CS and UCS should be viewed as separate constructs (Muris et al., 2018; Muris & Petrocchi, 2017; Neff, 2022). This position is supported by findings that UCS better predicts psychopathology than CS (Muris, 2016), and that individuals can exhibit high levels of both CS and UCS simultaneously (Ullrich-French & Cox, 2020). These perspectives challenge Neff’s unidimensional framework and suggest that distinct measurements for CS and UCS are necessary.

Recently, Ferrari et al. (2022) proposed that experimental designs should test the BCH by examining whether external factors affect CS and UCS differently. They argued that if CS and UCS are semi-independent, it should be possible for an individual to feel both compassionate and uncompassionate toward themselves at the same time. Ferrari et al. also noted that traditional psychometric approaches may be inadequate for resolving the BCH debate and suggested exploring self-compassion as a dynamic, context-dependent system. In response, our study shifts focus from trait-based measures like the SCS to state self-compassion, which captures transient experiences of compassion or self-criticism in specific situations. State self-compassion reflects the fluctuating nature of self-compassion across varying contexts, acknowledging that an individual’s position on the self-compassion continuum can change in response to emotional and situational factors. This approach provides a novel framework for testing Neff’s hypothesis by investigating the dynamic interactions between CS and UCS in real-time.

This shift from trait to state phenomena aligns with contemporary psychological research trends, emphasizing the context-dependent nature of psychological states. Research has increasingly recognized self-compassion as adaptable and responsive to specific interventions (Ferrari et al., 2019). Studies have examined the daily fluctuations of self-compassion and their effects on well-being using ecological momentary assessment (EMA). For example, Mey et al. (2023) found that higher momentary self-compassion was linked to increased positive affect, reduced negative affect, and decreased stress reactivity, with UCS more strongly predicting negative affect. Similarly, Sahdra et al. (2023), Biehler and Naragon-Gainey (2022), and Ewert et al. (2022) emphasized the importance of understanding how self-compassion fluctuates in relation to other psychological constructs like mindfulness, stress reactivity and well-being. These findings suggest that self-compassion is best studied as a dynamic construct, subject to momentary influences rather than a static trait.

Despite these advances, several limitations persist in the current literature. Many previous studies employed relatively short assessment periods, often limited to 7 days, which may not fully capture the complexity and fluctuations of state self-compassion. Furthermore, earlier studies lacked validated measures of state self-compassion, relying on ad hoc tools that may have compromised the reliability of their findings. In contrast, our study addressed these issues by using a longer assessment period (3 months) and a validated State Self-Compassion Scale (Neff, 2022). Additionally, no prior research has explored the factor structure of state self-compassion within an EMA framework, accounting for the hierarchical structure of repeated measurements nested within days and individuals.

Our study aims to empirically assess the BCH by exploring how situational factors influence the CS and UCS components of state self-compassion. We investigate whether these factors affect CS and UCS in opposite directions, as predicted by the BCH. If they do, this would support the BCH's view of self-compassion as a unified construct. Conversely, if situational factors impact CS and UCS differently, it would suggest that CS and UCS are independent dimensions of self-compassion, aligning with a dual construct framework.

Building on Ferrari et al.’s (2022) suggestions, we examined self-compassion as a dynamic process that fluctuates in response to context. Ferrari et al. proposed three hypotheses, which we test in the present study: (1) trait CS and UCS may exhibit greater independence over longer periods, while state CS and UCS, assessed in the short term, may be more closely linked; (2) stressful or negative situations may enhance the bipolarity between CS and UCS, making them more distinct; and (3) the relationship between CS and UCS may vary between individuals, highlighting the need for personalized approaches to understanding self-compassion.

We conducted two studies using EMA to assess state self-compassion, addressing these hypotheses. Study 1 focused on participants' immediate emotional states and event unpleasantness to explore the impact of external contextual factors on CS and UCS. Study 2 built on this approach, examining state self-compassion before and after a university exam to more directly test the role of highly salient contextual variables. We also introduced decentering, a core mindfulness component, to assess whether it affects both CS and UCS, providing a novel lens for testing the BCH.

Understanding the dynamic interactions between state CS and UCS has important implications for psychological interventions aimed at enhancing well-being. By investigating how situational factors influence self-compassion in real-time, our study aims to contribute to the theoretical understanding of self-compassion and inform practical strategies for fostering healthier self-relations in diverse life contexts.

# Study 1: Exploring Patterns and Dynamics in State Self-Compassion

Study 1 aimed to investigate whether momentary adverse emotional states, referred to as negative affect (NegAff; Haney et al., 2023), and the unpleasantness of an event influence the CS and UCS components of state self-compassion. The study examined inter-individual differences, daily contextual variations, and intraday fluctuations in these factors. We sought to test two hypotheses: (1) if the BCH holds, contextual influences should affect CS and UCS similarly but in opposite directions, and (2) emotionally salient contexts may amplify the bipolar relationship between CS and UCS (Dejonckheere et al., 2021; Ferrari et al., 2022).

## Method

**Procedure.** In our study, we utilized an EMA protocol to evaluate momentary self-compassion and mood variations, with a focus on real-time measurement of affective states. Initially, participants provided informed consent, and those meeting the inclusion criteria attended an introductory session. Here, we administered baseline measures assessing Self-Compassion as a trait characteristic, levels of depression, anxiety and stress over the past week, and emotion regulation capabilities. These were measured using the Self-Compassion Scale (Neff, 2003), the Depression Anxiety Stress Scale-21 (Lovibond & Lovibond, 1995), and the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), respectively – for details, see the Supplementary Information (SI). Following this, participants were trained in using the m-Path mobile application (Mestdagh et al., 2023) on their smartphones, which was used for completing the EMA surveys.

The EMA protocol extended over three months, encompassing 10 specific days within this timeframe. On these days, participants received five daily prompts, issued exclusively on Saturdays, based on a semi-random sampling protocol. The timing for these notifications was scheduled as follows: the first between 10:00 and 10:30 AM, the second between 3:00 and 3:30 PM, the third between 5:00 and 5:30 PM, the fourth between 7:00 and 7:30 PM, and the final one between 9:00 and 9:30 PM. Upon receiving a notification, participants were prompted to answer a set of 13 questions, encompassing momentary self-compassion, negative and positive affect, and their evaluation of a significant recent event since the last prompt.

**Participants.** In the study, participants were required to complete data collection on at least four of the ten designated days to ensure a detailed capture of their experiences. The sample included both undergraduate and graduate students from psychology courses, and participation was voluntary. In total, data from 326 participants were eligible for analyses. The mean age was 24.08 years (SD = 7.88 years).

Eligibility for participation in this study was contingent upon meeting several predefined inclusion criteria at the time of enrollment. Participants were required to: (1) be at least 18 years of age; (2) possess a proficient level of Italian; (3) have prior experience with smartphone usage; and (4) not have any self-reported mental health disorders or drug/alcohol addiction.

None of the participants reported present or past psychiatric disorders and none of them reported using medications.

Participants whose compliance rate fell below 50% were excluded from the study. This criterion led to the exclusion of 7 participants. Consequently, the final sample size was established at 326 individuals. Overall, participant compliance was notably high. On average, participants responded to 85% of the daily notifications. This means that out of an average of 5 notifications sent each day, participants responded to approximately 4.2 of them. Furthermore, when considering the entire duration of the study, the compliance rate across all days was 87%. In other words, participants responded on 8.7 out of the possible 10 days.

### Materials.

#### 

#### EMA protocol. The EMA protocol comprised 13 questions, which included items designed to assess various aspects of participants’ momentary experiences.

*Pleasant/Unpleasant Event.* The initial query consistently explored the emotional valence — pleasantness or unpleasantness — of the most impactful event since the last notification. For example, “Think about the most notable event that has occurred since you last received a notification. If this is your first notification of the day, consider the most significant event from the start of the day. How would you evaluate this event?” Participants were asked to rate the event on a 5-point Likert scale, where 1 indicates “extremely unpleasant” and 5 signifies “extremely pleasant.”

*Positive and Negative Affect.* We examined four emotional states using a combined approach of assessment tools. For negative emotions, we used two items from the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988): “At this moment, I feel NERVOUS” and “At this moment, I feel UPSET.” However, during a pre-test, we determined that the positive emotions items from PANAS did not align with our specific objectives of the study. Therefore, we opted for two positive emotions items from Kuranova et al. (2020): “At this moment, I feel CHEERFUL” and “At this moment, I feel SATISFIED.” Unlike PANAS, Kuranova et al. (2020) developed their affect items by calculating mean scores across all assessed emotions. From their proposed four items, we selected two that best represented the positive emotional states relevant to our study. Participants were then asked to rate the intensity of these emotions on a 5-point Likert scale, ranging from 1 (“not at all”) to 5 (“very”).

*State-Self-Compassion Scale Short Form (SSCS-SF).* Developed recently by Neff et al. (2021), the SSCS-SF is a 6-item self-report tool designed to measure the current level of Self-Compassion. The scale encompasses six items, each reflecting one of the subscales of the Trait-SCS. These include three positive subscales — Mindfulness, Common Humanity, Self-Kindness — and three negative subscales — Overidentification, Self-Judgement, Isolation. The CS dimension is calculated by summing the scores of the positive items (*e.g.*, “At this moment, I have care and tenderness towards myself”), while the UCS dimension is derived from the aggregate of the negative items (*e.g.*, “I can’t stop thinking about everything that is wrong”). To ensure a minimum of 4 items for each dimension (McDonald, 2013), in line with the specific aims of our study, we augmented the SSCS-SF with two supplementary items. These additional items - one for the CS dimension and another for the UCS dimension - were carefully chosen from the State-SCS Long Form (Neff et al., 2021). Our selection criteria prioritized items with the highest factor loadings, as determined by a previous factor analysis conducted with a similar sample (Colpizzi et al., 2024). Participants were requested to rate how accurately each item described their current experience on a 6-point Likert scale, ranging from 1 (“extremely false”) to 6 (“extremely true”). The SSCS-SF has shown adequate psychometric properties according to Neff et al. (2021).

**Data Analysis Plan**

We employed two Bayesian hierarchical models to investigate the relationships between the CS and UCS components of state self-compassion and the contextual factors of negative affect and the level of unpleasantness of the event. The regression analysis encompassed inter-individual differences, variations in the context from day to day within individuals, and fluctuations within days for these two contextual factors. In a further analysis, we employed a Bayesian hierarchical model to directly examine the linear relationship between the UCS and CS components of state self-compassion. This model was designed to accommodate momentary shifts in negative affect and subjective context evaluation, while also addressing the stratified nature of our data.

**Statistical Analysis**

All analyses were performed using Bayesian multi-level models to estimate both central tendencies and variances of outcome variables, contingent on predictor values. Bayesian methods were chosen for their ability to provide a probabilistic interpretation of model parameters, enhancing the robustness of results.

We utilized Markov Chain Monte Carlo (MCMC) simulations, specifically Hamiltonian Monte Carlo implemented in Stan (Stan Development Team, 2020), with weakly informative priors to ensure adequate model fit. The posterior distributions were derived from at least 2,000 samples across four chains, following 1,000 adaptation steps.

The optimal model structure, incorporating both random and fixed effects, was determined through a model comparison process. All numerical variables were standardized prior to analysis to enhance comparability and interpretability. To identify the best model fit, we employed the Leave-One-Out Cross-Validation (LOO) procedure, which evaluates out-of-sample prediction accuracy by sequentially excluding individual observations from the dataset and assessing the model’s performance on these excluded points. Models demonstrating lower LOO values were interpreted as having superior fit and enhanced predictive accuracy – details are available in the Supplementary Information (SI).

Results are presented as posterior distributions with means (β) and 89% credibility intervals (CI). Contrasts were calculated to determine the expected difference between levels of a predictor, reported with 89% highest posterior density intervals (HPDI). Model parameters are considered to show an effect if their 89% CI does not include zero. Unlike frequentist confidence intervals, the 89% CI in Bayesian analysis represents the range within which the parameter value lies with 89% probability, given the observed data. Bayesian models do not rely on p-value thresholds but provide a probabilistic view of parameters and their uncertainties, reducing the likelihood of Type I errors and offering greater flexibility compared to frequentist approaches (McElreath, 2020).

**Correlations between CS and UCS components of State Self-Compassion**.

The multilevel correlation, which accounts for the nested structure of participants, days, and individual measurements within each day, between the CS component of state self-compassion (computed as the sum of four compassionate items) and the UCS component (computed as the sum of four uncompassionate items) was -0.48 (89% CI [-0.49, -0.47]). This moderate negative correlation highlights the interconnected nature of CS and UCS within daily experiences.

The impact of situational factors on state self-compassion becomes evident when considering even the smallest time lag (i.e., a time lag of one) within the same day. Specifically, the correlation between CS at a given time point and UCS at the immediately preceding time point weakens substantially, dropping to -0.10 (89% CI [-0.12, -0.08]). This substantial reduction underscores the strong influence of immediate situational contexts on the CS and UCS components of state self-compassion.

**Multilevel Reliability.** We conducted a multilevel reliability analysis of the CS and UCS components of the State Self-Compassion scale by using the procedure proposed by Lai (2021). For the *CS component*, the Within-Subject Reliability () was equal to 0.626, indicating moderate consistency in responses across different measurement occasions. This level of reliability reflects the variability in individuals’ self-compassionate responses over time. A higher reliability index of 0.820 was observed for the Between-Subject Reliability (), demonstrating the measure’s effectiveness in distinguishing stable individual differences in self-compassion. Finally, the overall Composite Reliability () was 0.79, suggesting a reliable integration of both within and between-subject variabilities. For the *UCS component*, slightly higher than the CS component, the Within-Subject Reliability () was equal to 0.68, indicating moderate consistency in responses over time. Markedly robust at 0.88, the Between-Subject Reliability () indicates a strong individual differentiation in the UCS component of state self-compassion. Finally, the Composite Reliability () for the UCS component was 0.83, reinforcing the measure’s overall reliability.

In summary, the between-subject reliability indices for both components, particularly the UCS component, surpass the benchmark of 0.8, suggesting the scale’s effectiveness in capturing stable individual differences in state self-compassion. The within-subject reliabilities, while lower, are reflective of state self-compassion as a dynamic construct. These values capture the natural fluctuation in the CS and UCS levels due to changing circumstances and internal states, highlighting the scales’ sensitivity to temporal variations within individuals.

## Results

**The Impact of Negative Affect and Event Unpleasantness on State Self-Compassion**.

Two Bayesian hierarchical models were employed to investigate the influence of contextual factors on the CS and UCS components of the state self-compassion scale. These models considered between-day variations within individuals and within-day fluctuations as predictors. Specifically, the CS and UCS components of the state self-compassion were modeled as functions of six predictors: negative affect and the level of unpleasantness of the event. These predictors were centered to isolate three distinct dimensions of variance: inter-individual differences, between-day variations within the same individual, and within-day fluctuations within each individual (see SI for details).

For both CS and UCS, the effects of NegAff were observed in opposite directions. Higher NegAff was associated with a decrease in CS and an increase in USC. For CS: NegAff moment: β = -0.24 (89% CI: -0.25 to -0.23); NegAff day: β = -0.26 (89% CI: -0.27 to -0.25); NegAff person: β = -0.51 (89% CI: -0.57 to -0.45). For USC: NegAff moment: β = 0.26 (89% CI: 0.25 to 0.27); NegAff day: β = 0.31 (89% CI: 0.30 to 0.32); NegAff person: β = 0.65 (89% CI: 0.60 to 0.71).

The effects of the level of unpleasantness of the most salient situational event on both CS and UCS were minimal but slightly positive. For CS, Unpleasantness moment: β = 0.04 (89% CI: 0.03 to 0.05); Unpleasantness day: β = 0.01 (89% CI: -0.00 to 0.02); Unpleasantness person: β = 0.01 (89% CI: -0.05 to 0.07). For USC: Unpleasantness moment: β = 0.00 (89% CI: -0.01 to 0.01); Unpleasantness day: β = 0.04 (89% CI: 0.03 to 0.05); Unpleasantness person: β = 0.12 (89% CI: 0.07 to 0.17).

In summary, the analysis of NegAff provides strong support for the BCH. The data clearly show an inverse relationship between NegAff and the two components of state self-compassion – CS and UCS – aligning well with Neff’s hypothesis. This suggests that as negative affect increases, CS decreases while UCS increases, and vice versa.

The influence of the level of unpleasantness of the most salient situational event on self-compassion presents a more complex picture. The relationship between the level of unpleasantness and the SC and USC components does not align as straightforwardly with the BCH. This complexity suggests that additional factors or more intricate mechanisms may be influencing how contextual evaluations affect state self-compassion. However, it is important to note that the effect sizes for the unpleasantness of the event are notably small, as indicated by the standardized partial regression coefficients. This observation implies that while the unpleasantness of the most salient event has some impact on state self-compassion, its overall influence is relatively minor compared to the more substantial effects of negative affect.

**Direct Test of the BCH for State Self-Compassion**

To directly test the bipolar continuum hypothesis (BCH), we implemented a Bayesian hierarchical model where un-compassionate self (UCS) was used as a linear predictor of compassionate self (CS), while also incorporating covariates such as within-day centered negative affect and context evaluation. Random effects were included to account for variability across participants, days, and measurements, ensuring the model captured fluctuations in state self-compassion. The use of experience sampling data enriched with relevant covariates enabled a comprehensive analysis of the CS-UCS relationship under diverse conditions. The model outcomes revealed a robust negative association between CS and UCS (median estimate = -0.44, 89% CI [-0.47, -0.42]), supporting the BCH by demonstrating that higher levels of CS are associated with lower levels of UCS (for details, see SI). A direct test of the BCH hypothesis was provided by using a different method as described in Section X.

**Study 2: Advancing Insights into State Self-Compassion Dynamics**

Study 2 investigates the relationships between contextual factors and the CS and UCS components of state self-compassion in high-stress environments. High-stress conditions provide a more stringent test of the BCH because stress could differentially impact the CS and UCS components. In stressful situations, individuals might struggle to maintain state CS while becoming more prone to self-criticism (UCS). Conversely, those who manage stress effectively might exhibit higher levels of self-compassion and lower levels of self-criticism, thereby supporting the bipolar nature of these components. Moreover, if high-stress conditions may lead to both increased CS and increased UCS simultaneously (Ullrich-French and Cox, 2020). This would suggest that the two components can co-exist and are not necessarily on a single bipolar continuum. Such a result would indicate that self-compassion and self-criticism might operate independently under certain conditions.

## Methods

**Procedure.** Mirroring the methodology of Study 1, this investigation initiated with participants providing informed consent and those meeting the inclusion criteria attending an initial session. During this session, we assessed baseline measures as in Study 1 – for details, see SI. Subsequent to the baseline assessment, participants underwent training in the use of the m-Path mobile application (Mestdagh et al., 2023).

The EMA protocol spanned three months, with data collection occurring over 16 selected days. Participants received five daily prompts on Saturdays, in line with a semi-random sampling approach. The timing of these notifications was set at specific intervals throughout the day: between 10:00 and 10:30 AM, 3:00 and 3:30 PM, 5:00 and 5:30 PM, 7:00 and 7:30 PM, and finally, between 9:00 and 9:30 PM.

In contrast to Study 1, Study 2 introduced a novel protocol element: context-specific notifications. In addition to the regular prompts, participants received notifications during known high-stress periods, specifically before and after exams (on 4 out of the 16 total days). This modification was intended to capture participants’ emotional and self-compassionate responses in real-time during stressful scenarios, providing contextually enriched data.

The study was structured around three distinct temporal phases to assess the impact of this stressor: (1) the Pre-Exam Phase (immediately before the exam, capturing anticipation and concern), (2) the Post-Exam Phase (immediately after the exam, reflecting immediate reactions and relief or ongoing stress), and (3) the Distant Time Point Phase (a period significantly after the exam, when the stressor became less relevant). This time-based segmentation allowed for the comparison of emotional and psychological responses across periods of heightened and reduced stress, enabling an evaluation of dynamic changes in self-compassion, stress, and related constructs in response to varying levels of stress proximity.

Each notification prompted participants to respond to a set of 17 questions designed to assess momentary self-compassion, positive and negative affect, decentering ability, and their evaluation of a notable event since the last prompt.

### Participants.

Participants in this study were required to complete data collection on at least four of the 16 designated days to ensure a detailed capture of their experiences. The participant group comprised both undergraduate and graduate students enrolled in psychology courses, and their involvement in the study was voluntary. The analysis included data from 168 participants, with an average age of 19.6 years (SD = 1.9). Consistent with Study 1, eligibility for this study required participants to meet predefined criteria, including the absence of a mental health diagnosis.

None of the participants reported current or past psychiatric disorders, and none of them reported using medications.

In this study, we set the compliance criterion at a minimum of 50%. This criterion led to the exclusion of 2 participants. Consequently, the final sample size was established at 168 individuals. The overall compliance rate was high. On average, participants engaged with 82% of the daily notifications, translating to responses to about 4.1 out of every 5 notifications sent each day. Additionally, when considering the entire duration of the study, the compliance rate across all days was 72%. This indicates that, on average, participants were responsive on 7.2 out of the 10 days of the study.

**Materials.** The EMA protocol in this study consisted of 17 questions, incorporating the same items as used in Study 1. These included: (1) Assessment of Pleasant/Unpleasant Events, (2) Evaluation of Positive and Negative Affect, and (3) the State-Self-Compassion Scale Short Form (SSCS-SF). However, a notable addition in this protocol, differing from Study 1, was the inclusion of 4 items specifically designed to assess decentering abilities. These additional items, derived from previous EMA studies (Biehler & Naragon-Gainey, 2022), were integrated to provide a deeper understanding of the participants’ ability to observe their thoughts and feelings from a detached perspective. We introduced decentering, a key component of mindfulness, which refers to the ability to take a detached and objective perspective on one's mental experiences. Decentering plays a critical role in how individuals relate to their own suffering, a central aspect of self-compassion (Biehler & Naragon-Gainey, 2022). By adopting a decentered perspective, individuals may respond to negative emotions with greater kindness and understanding, thereby enhancing CS. According to the BCH, this should correspond with a decrease in UCS. If the BCH does not hold, however, decentering may impact only CS without affecting UCS. Furthermore, decentering may influence how individuals process stress, helping them recognize stressful emotions as temporary and not reflective of their identity (Bernstein et al., 2015), which could help sustain or enhance CS while reducing UCS.

**Data Analysis Plan.** Our initial analysis examined the impact of two academic exams on state self-compassion, with their timings strategically manipulated by the research team. We segmented the exam periods into pre-exam, post-exam, and non-exam phases to capture state self-compassion fluctuations across these distinct temporal contexts. This design allowed us to observe how the timing of exams – controlled and manipulated as a contextual factor – impacted the two components of state self-compassion, providing a unique opportunity to interpret these effects as direct consequences of our manipulation.

Study 2 broadened the investigation of study 1 by introducing decentering as a novel variable. Our multi-level analysis examined inter-individual differences, between-day variations, and within-day fluctuations in state self-compassion, utilizing an array of predictors including negative affect, decentering, and the level of the unpleasantness of the event. In a direct test of the BCH, we employed a Bayesian hierarchical model, predicting the UCS component from the CS component. This model incorporated momentary negative affect, decentering, and the level of the unpleasantness of the event, along with random effects for participants and days. In a final statistical analysis, we compared the multilevel correlations between CS and UCS of state self-compassion that were computed during three distinct temporal phases (chosen to represent periods of varying stress levels and personal relevance), in order to test the hypothesis of Dejonckheere et al. (2021).

## Results

### Impact of Academic Exam on State Self-Compassion.

To analyze the impact of two academically scheduled exams on students' state self-compassion, we utilized two distinct Bayesian hierarchical models. The prompts were strategically scheduled to create distinct periods for analysis: *No Exam* (baseline; at least a week before or after the exam), *Pre-Exam* (the evening before the exam), and *Post-Exam* (the evening of the exam day). The primary objective was to monitor fluctuations in the CS and UCS components of state self-compassion during these key moments. We hypothesized that anxiety would escalate before the exams (*Pre-Exam*) and decrease after the exams (*Post-Exam*), potentially reverting to baseline or lower levels due to the typically positive outcomes of these exams.

In fact, our results revealed robust contextual influences on state self-compassion.

1. In the *Pre-Exam* period, there was a decrease in CS compared to baseline (posterior estimate for beta\_pre: -0.29; 89% CI: [-0.51, -0.08]; p(β) < 0 = 0.98). This suggests that the anticipation of the exam substantially lowered students’ compassionate self-responses. Conversely, UCS increased compared to baseline (posterior estimate for beta\_pre: 0.66; 89% CI: [0.38, 0.95]; p(β) > 0 = 1), indicating heightened self-criticism or reduced self-kindness during this stressful period.

2. In the *Post-Exam* period, there was an increase in CS compared to baseline (posterior estimate: 0.23; 89% CI: [0.02, 0.45]; p(β) > 0 = 0.96), suggesting a rebound in self-compassion following the stressor. UCS decreased compared to baseline (posterior estimate: -0.67; 89% CI: [-0.95, -0.39]; p(β) < 0 = 1), indicating a reduction in self-criticism or increased self-kindness post-exam – see Figure 2.

**Figure 2**

*Study 2: Posterior Distribution of CS and UCS Components Before and After Exam Days*

Immagine che contiene diagramma, Diagramma, testo, schermata

Descrizione generata automaticamente

*Note.* **Top Panel:** This panel illustrates the differences in self-compassion levels, both CS and UCS, on the day before an exam relative to typical non-exam days. The differences were calculated by subtracting the self-compassion levels on non-exam days from those on the day before the exam. **Bottom Panel:** This panel presents the differences in self-compassion levels on the day after an exam, again compared to non-exam days. Contrary to the day before the exam, the day after an exam typically witnesses a reversal in the trends of CS and UCS levels. The graph depicts that, as expected, the UCS component sees an elevation the day before the exam, indicating increased stress or negative self-concept, while the CS component declines, suggesting a decrease in positive self-compassion. This trend reverses the day after the exam, with the CS component rebounding above the pre-exam average and the UCS component diminishing. The zero line on the graph represents the reference level of self-compassion during periods not influenced by exam stress, serving as a steady-state benchmark for comparison.

These results underscore the dynamic nature of state self-compassion in relation to situational stressors. The observed decrease in CS and increase in UCS before the exam, relative to baseline levels, demonstrate the strong impact of stress on state self-compassion. The reversal of these trends post-exam, with an increase in CS and decrease in UCS, indicates a recovery in state self-compassion levels. The findings provide strong evidence supporting the BCH. The inverse relationship between CS and UCS in response to stress and subsequent relief aligns with the BCH's prediction that increases in CS are associated with decreases in UCS, and vice versa. This dynamic response to contextual stressors strengthens the argument that CS and UCS exist on a single continuum.

The distinct changes in CS and UCS in opposite directions before and after the exam also highlight the necessity of considering temporal context when evaluating state self-compassion. The results suggest that while CS and UCS generally move inversely to one another, the intensity and direction of these changes are heavily influenced by specific situational factors. These insights emphasize the importance of understanding the nuanced and context-dependent nature of state self-compassion, reinforcing the BCH while also pointing to the complex interplay between stress, self-compassion, and individual differences in emotional regulation.

**Testing the Bipolar Continuum Hypothesis Through Contextual Influences on State Self-Compassion**.

In our second statistical analysis, we replicated a similar approach used in Study 1 to test the BCH. We examined the influence of contextual factors on the SC and UCS components of state self-compassion separately. Utilizing two Bayesian hierarchical models, we modeled the SC and UCS components as functions of nine predictors: negative affect, decentering, and the level of unpleasantness of the event. To distinguish specific dimensions of variance, these predictors were uniquely centered to capture: 1. Inter-Individual Differences: Variations between different individuals. 2. Between-Day Variations: Changes within the same individual across different days. 3. Within-Day Fluctuations: Fluctuations within the same individual throughout a single day. This comprehensive approach allowed us to dissect the relative contributions of these different dimensions of variance, thereby providing a nuanced understanding of how contextual factors impact state self-compassion in line with the BCH.

For the compassionate dimension of CS, there was robust inter-individual variability. The baseline compassionate self-view among participants varied, with a standard deviation of 0.56 for the intercept (89% Confidence Interval [CI]: [0.51, 0.61]). Our analysis revealed a strong negative association of NegAff with state self-compassion across various levels. Person-level: β = -0.31 (89% CI [-0.40, -0.22]); Day-level: β = -0.17 (89% CI [-0.18, -0.15]); Moment-level: β = -0.13 (89% CI [-0.14, -0.11]). Conversely, decentering demonstrated a positive correlation with SC. Person-level: β = 0.20 (89% CI [0.12, 0.27]); Day-level: β = 0.12 (89% CI [0.11, 0.13]); Moment-level: β = 0.08 (89% CI [0.07, 0.09]). The subjective evaluation of the level of unpleasantness of the event showed a modest positive relationship with state self-compassion. Person-level: β = 0.03 (89% CI [-0.05, 0.11]); Day-level: β = 0.04 (89% CI [0.02, 0.05]); Moment-level: β = 0.02 (89% CI [0.01, 0.04]).

For the UCS, credible inter-individual differences were also observed. The standard deviation for the intercept related to user\_id was 0.47 (89% CI [0.43, 0.51]), indicating considerable variations in baseline levels of uncompassionate self-view. Negative affect was positively correlated with state self-compassion across various levels. Person-level: β = 0.33 (89% CI [0.25, 0.41]); Day-level: β = 0.16 (89% CI [0.15, 0.18]); Moment-level: β = 0.14 (89% CI [0.13, 0.15]). In contrast, decentering showed a significant negative correlation with state self-compassion. Person-level: β = -0.36 (89% CI [-0.43, -0.30]); Day-level: β = -0.22 (89% CI [-0.23, -0.21]); Moment-level: β = -0.15 (89% CI [-0.16, -0.13]). The perception of the level of unpleasantness of the event exhibited minimal correlations. Person-level: β = 0.05 (89% CI [-0.02, 0.12]); Day-level: β = -0.00 (89% CI [-0.01, 0.01]); Moment-level: β = -0.03 (89% CI [-0.04, -0.01]).

These findings provide substantial support for the BCH. The observed opposite influences of contextual factors on the CS and UCS components of state self-compassion across all levels of variance (inter-individual, between-day, and within-day) align with the BCH. The strong negative association between negative affect and CS, coupled with the positive association between negative affect and UCS, suggests that increases in self-compassion are associated with decreases in self-criticism, and vice versa. Furthermore, the positive relationship between decentering and CS, along with its negative relationship with UCS, indicates that mindfulness practices may enhance compassionate responses while reducing uncompassionate ones, thus reinforcing the bipolar nature of these components in qualitative terms. The modest influence of the level of unpleasantness of events on state self-compassion also highlights the complex interplay of situational factors in shaping self-compassion.

Collectively, these results underline the dynamic and context-dependent nature of state self-compassion. They validate the BCH by demonstrating that CS and UCS are inversely related across various contexts and individual differences, confirming that self-compassion operates as a bipolar construct rather than as independent or synergistic elements.

**Direct Test of the BCH for State Self-Compassion**

For testing the Bipolar Continuum Hypothesis (BCH), we conducted a Bayesian hierarchical model where un-compassionate self (UCS) was predicted linearly from compassionate self (CS), with covariates including within-day centered negative affect (NegAff), decentering, and event unpleasantness. Random effects were incorporated to account for individual variability across participants, days, and event unpleasantness. The analysis revealed a strong negative association between CS and UCS (β = -0.43, 89% CI [-0.47, -0.39]), supporting the BCH. Additionally, NegAff was positively associated with UCS (β = 0.07, 89% CI [0.06, 0.08]), while decentering was inversely related to UCS (β = -0.08, 89% CI [-0.09, -0.07]). The effect of event unpleasantness was slight and marginally negative (β = -0.005, 89% CI [-0.016, 0.005]) (for details, see SI). A direct test of the BCH hypothesis was provided by using a different method as described in Section X.

**Levels of Personal Concern.** In a further statistical analysis, we tested the BCH by examining the correlations between the CS and UCS components of state self-compassion across different levels of personal concern and stress. To validate this hypothesis, we examined correlations in high-stress situations (high personal concern) and low-stress contexts (low personal concern). If strong negative correlations are observed consistently across both high and low stress contexts, this would strongly support the BCH by demonstrating that the inverse relationship between CS and UCS remains stable regardless of stress levels. Instead, if high stress contexts show weak or independent correlations between CS and UCS, this would challenge the BCH by suggesting that the relationship between self-compassion components becomes less bipolar and more independent when personal concern is increased.

In high-stress situations, such as the day before an exam, the CS-UCS correlation was -0.70 (89% CI: [-0.76, -0.62]). This strong negative correlation indicates that higher levels of CS are associated with lower levels of UCS, consistent with the BCH. Immediately after the exam, this pattern remained consistent, reinforcing the inverse relationship between CS and UCS, with a correlation of -0.70 (89% CI: [-0.78, -0.59]). In a lower stress context, far removed from the exam, the CS-UCS correlation shifted to -0.79 (89% CI: [-0.95, -0.60]). This period was selected for its high compliance and uniformity in EMA notification timing, providing a stable baseline for comparison. Notably, the 89% CI in this lower stress context substantially overlapped with those observed in the higher stress conditions.

These results validate the BCH. The stable, strong negative correlations across different levels of personal concern suggest that the interplay between self-compassion components remains consistent, regardless of fluctuating stress levels.

**Decentering and CS and UCS Correlation.** In a final statistical analysis, we aimed to test the BCH by examining the influence of decentering on the relationship between the CS and UCS components of state self-compassion. Decentering refers to the ability to observe thoughts and feelings as temporary and separate from the self. We hypothesized that individuals with higher levels of momentary decentering would exhibit a stronger negative correlation between CS and UCS, reinforcing the bipolar nature of self-compassion. Conversely, if decentering did not strengthen the negative correlation between CS and UCS, or if the correlation became weaker, this would challenge the BCH by suggesting that decentering might lead to a more independent or synergistic relationship between CS and UCS.

To investigate this hypothesis, we employed a Bayesian multivariate model to examine how individual levels of decentering affect the relationship between CS and UCS components of state self-compassion. The results indicate that higher levels of decentering are associated with a stronger negative correlation between CS and UCS (β = 0.06, 89% CI [0.05, 0.07]). This means that individuals who frequently engage in decentering, a core aspect of mindfulness, show a more pronounced inverse relationship between compassionate and uncompassionate self-responding. Additionally, the residual correlation between CS and UCS was negative (Estimate = -0.39, 89% CI [-0.48, -0.29]), further reinforcing the interconnectedness of these components. The observed interaction effect, where higher levels of decentering are associated with a stronger negative correlation between CS and UCS, supports the BCH. This suggests that mindfulness practices promoting decentering may reinforce the bipolar nature of self-compassion. As individuals become better at recognizing thoughts and emotions as transient and separate from their identity, the inverse relationship between CS and UCS becomes more pronounced.

**Dimensionality Test**

Previous research has consistently supported the BCH by demonstrating that models with a general factor offer superior fit when examining the dimensionality of \*trait\* self-compassion. Extending this research, our study evaluated the dimensionality of \*state\* self-compassion using multilevel confirmatory factor analysis (CFA) to account for the hierarchical structure of repeated measurements nested within days and individuals. We compared three models: a \*\*One-Factor Model\*\* representing self-compassion with a single latent factor, a \*\*Two-Factor Model\*\* distinguishing between compassionate self (CS) and un-compassionate self (UCS), and a \*\*Bifactor Model\*\*, which includes both a general self-compassion factor and orthogonal specific factors (CS and UCS). The Bifactor Model demonstrated the best overall fit, as indicated by progressively improving goodness-of-fit indices and significant Likelihood Ratio Test results. This suggests that self-compassion is best represented by both a general factor and specific components (CS and UCS) – see Table S1.

However, dimensionality assessments must balance statistical fit with substantive interpretability. While more complex models like the Bifactor Model may achieve better fit, they risk overfitting the data. In the Bifactor Model, the general factor accounted for most of the explained variance, while specific factors contributed minimally, indicating that a unidimensional solution may offer similar explanatory power with less complexity.

The multilevel CFA analysis supports Neff’s hypothesis that CS and UCS are inversely related at the trait level, with individuals high in CS tending to have lower levels of UCS, and vice versa.

It is important to emphasize that multilevel CFA examines \*latent, person-level relationships\*, which capture general trends over time and context. The present analysis demonstrates that CS and UCS are correlated at a global level. In contrast, other analyses focused on \*momentary dynamics\* may suggest that CS and UCS operate more independently within individuals over short time periods. This distinction clarifies that Neff’s hypothesis may hold at a trait level but requires further exploration at the momentary level (for details, see SI).

**Modeling the Dynamic Relationship Between Compassionate and Uncompassionate Self-Responding: An Idionomic Approach**

The analyses described in the previous section provided evidence supporting the “essential unidimensionality” (Reise, Bonifay, and Haviland 2013) of state self-compassion. Our multilevel framework, which accounted for repeated measurements within individuals over a three-month period, demonstrated that compassionate and uncompassionate self-responding (CS and UCS) are inversely related at the nomothetic level – that is, when examined across the entire sample.

Our psychometric evaluations, using purely internal criteria (fit indices for item scores), re- vealed that more complex models improved statistical fit. However, these improvements did not fundamentally challenge Neff’s hypothesis of a bipolar continuum. While minor deviations and better fit indices were observed with more complex models, their practical importance was limited, and the overall pattern of findings remained aligned with the notion of CS and UCS as opposing dimensions. This conclusion was further corroborated when considering external criteria, including covariates such as momentary negative affect and context evaluation, as described in our two studies. These situational factors did not substantially disrupt the core relationship between CS and UCS proposed by the bipolar continuum hypothesis.

It is important to note, however, that all previous analyses were conducted at a nomothetic level, focusing on group-level patterns. This approach, while valuable, may obscure important differences in how self-compassion operates in the everyday life of individuals. The variability in how individuals experience and express self-compassion across different contexts might not be fully captured in these broad, averaged analyses.

To address this limitation and gain deeper insights into person-specific dynamics, we conducted an idionomic analysis to examine the relationship between UCS and CS at the individual level by combining samples from both studies (Ciarrochi et al. 2024; Ferrari et al. 2022; Sahdra et al. 2024). This approach allows us to explore potential heterogeneity in self-compassion processes that may be masked by nomothetic analyses, providing a more nuanced understanding of how these constructs interact within-individuals over time.

**Idionomic Analysis of the Relationship Between UCS and CS**

For the present purposes, an idionomic analysis was conducted in two stages. The first stage involved a strictly idiographic approach, focusing on the individual-level patterns. In the second stage, we applied a nomothetic approach to examine and describe group-level regularities as well as the variability in these effects across individuals (e.g., Ciarrochi et al. 2024; Sahdra et al. 2024).

Step 1: Fitting Individual-Level Hierarchical Bayesian Models. For each participant separatedly, we implemented a hierarchical Bayesian model using Stan to estimate the rela- tionship between uncompassionate (UCS) and compassionate self-responding (CS). The model incorporated additional covariates, including negative affect and context evaluation, as well as lagged effects of CS from the previous measurement within the same day. The model for each participant was specified as follows:

UCS𝑛 ∼ 𝑡𝜈(𝛼 + 𝛾CS ⋅ CS𝑛 + 𝛾neg\_aff ⋅ neg\_aff𝑛 + 𝛾context ⋅ context𝑛 + 𝜙 ⋅ lag\_CS𝑛

+ 𝛾interaction ⋅ CS𝑛 ⋅ neg\_aff𝑛, 𝜎),

Where:

• UCS𝑛 represents the CS score for observation 𝑛,  
• 𝛼 denotes the intercept,  
• 𝛾CS is the coeﬀicient for the primary predictor, CS (CS𝑛),  
• 𝛾neg\_aff and 𝛾context are coeﬀicients for negative affect (neg\_aff𝑛) and context evaluation

(context𝑛), respectively,  
• 𝜙 represents the autoregressive coeﬀicient for the lagged CS within the same day

(lag\_CS𝑛 ),  
• 𝜎 is the scale parameter (standard deviation) of the distribution,  
• 𝜈 denotes the degrees of freedom of the Student’s t-distribution,  
• 𝛾interaction is the coeﬀicient for the interaction term between CS and negative affect.

This model allows for the examination of the association between UCS and CS while controlling for the effects of negative affect, context evaluation, lagged CS effects within the same day, and the CS × negative-affect interaction. We employed a Student’s t-distribution (𝑡𝜈) to account for potential outliers or heavy-tailed distributions in the data (see Supplementary Information for further details).

For each participant, we examined the posterior distribution of the gamma\_CS coeﬀicient to estimate the proportion of posterior draws that were negative. This enabled us to evaluate whether there was evidence of a negative association between UCS and CS at the individual level, in line with Neff’s bipolar continuum hypothesis. Additionally, we computed the mean posterior estimates for the gamma\_neg\_aff, gamma\_context, and gamma\_interaction param- eters, which represent the effects of negative affect, context evaluation, and the interaction between CS and negative affect, respectively, on UCS for each participant.

Step 2: Aggregate Analysis Using a Hierarchical Model. After the idiographic analysis, we used a hierarchical model (e.g., Ciarrochi et al. 2024) in the brms package (R) to summarize the proportion of negative estimates for the gamma\_CS parameter across participants. This model employed a binomial distribution, with the total number of posterior samples as the denominator and the proportion of negative estimates as the response. A random intercept for participants was included to account for individual variability.

Hierarchical models were also applied to the mean posterior estimates of the gamma\_neg\_aff, gamma\_context, and gamma\_interaction parameters, representing the influences of negative affect, context evaluation, and the interaction between CS and negative affect on UCS. Each model included a fixed effect (intercept) and random intercepts for participants, capturing individual differences. A Student-t likelihood was used to account for potential outliers and accommodate the heavy-tailed nature of the effect distributions, providing robust aggregate estimates of each parameter and the heterogeneity of their relationships with UCS (see Sup- plementary Information for further details).

**Results**

The analysis of the gamma\_CS parameter across participants indicated that 81.0% (89% CI [0.796, 0.823]) of the posterior estimates for the association between uncompassionate self- responding (UCS) and compassionate self-responding (CS) were negative. This supports Neff’s bipolar continuum hypothesis, which posits an inverse relationship between UCS and CS. However, the variability in individual effects (sd(Intercept) = 1.25, corresponding to 0.196 on the probability scale) suggests moderate heterogeneity in the strength of this relationship across participants.

For the influence of negative affect on UCS, represented by the gamma\_neg\_aff parameter, the analysis revealed a positive overall effect (intercept = 0.38, 89% CI [0.34, 0.42]), indicating that higher levels of negative affect are generally associated with increased UCS. The variability between individuals (sd(Intercept) = 0.19, corresponding to 0.547 on the probability scale) suggests substantial heterogeneity in how strongly negative affect influences UCS.

The analysis of context evaluation showed a small but credible negative effect on UCS (mean = -0.04, 95% CI [-0.07, -0.01]), suggesting that higher context evaluation scores are associated with a slight reduction in UCS. The variability in individual responses (sd(Intercept) = 0.17, corresponding to 0.543 on the probability scale) also indicates substantial heterogeneity in the relationship between context evaluation and UCS across participants.

Finally, the interaction between CS and negative affect was negligible, with the 89% credible interval spanning zero (-0.03, 0.00), suggesting no meaningful interaction effect between these variables on UCS.

# Discussion

In our EMA studies, we investigated the relationship between contextual factors and state self-compassion, focusing on inter-individual differences, daily variations within individuals, and intra-day fluctuations. This approach aligns with Ferrari et al. (2022), who argued for a paradigm shift in self-compassion research by proposing three hypotheses. They critiqued the traditional focus on the "true structure" of the Self-Compassion Scale (SCS) using standard factor models, which often yield statistically similar results, and instead advocated for a more dynamic approach, emphasizing time (hypothesis 1), context (hypothesis 2), and individual differences (hypothesis 3).

Following Ferrari et al.’s first hypothesis, we conducted two EMA studies that focused on state self-compassion rather than trait self-compassion. EMA allows for investigating self-compassion in real-time (“In this moment, I feel…”), as opposed to a longer reflective period typical of trait self-compassion assessments. Additionally, by using EMA, we were able to test the second hypothesis by examining how the two components of state self-compassion, CS and UCS, fluctuate over time—both within a day and across days—while considering external contextual factors such as negative affect and the salience of a recent event.

Our findings, based on multiple measurements per day and across different days, revealed that CS and UCS are influenced by contextual factors like negative affect and the subjective valence of the context. Importantly, these effects followed the same qualitative pattern but in opposite directions, consistent with the BCH. This pattern became more pronounced in Study 2 when examining salient events like university exams for a student sample, where the relationship between CS and UCS became more polarized, further supporting Neff’s BCH (Ferrari et al., 2022).

This first set of analyses was conducted at the *nomothetic level*, examining group-level patterns. While these findings are consistent with Neff’s theory, this approach may obscure important individual differences in how CS and UCS operates in everyday life. To address this issue, we employed an idionomic approach (Sahdra et al., 2024), which integrates both idiographic (individual-specific) and nomothetic (group-level) perspectives, in line with Ferrari et al.'s third hypothesis. Unlike traditional methods, which focus on group averages and assume uniformity across individuals, the idionomic approach recognizes and preserves individual variability. This is crucial in psychology, where processes often vary greatly between individuals. Given that the BCH assumes universality, it is essential to explore whether group-level findings hold at the individual level. Our idionomic analysis revealed heterogeneity in the CS-UCS relationship across individuals. While most participants displayed the expected inverse relationship, by sustaining the BCH, a certain proportion showed no clear association, and a smaller subset exhibited positive correlations (%)—suggesting that for some individuals, CS and UCS may vary together rather than inversely. These findings suggest that while the BCH holds for the majority of individuals within the sample, there is a subset for whom it does not apply. This highlights the need for a more cautious interpretation of the BCH, which appears valid at the group level but may not fully capture individual-level variability.

We further employed a multilevel SEM analysis—the first applied to EMA data on state self-compassion—to test whether the factor structure aligns with the BCH. We compared three models: a One-Factor Model, a Two-Factor Model (separating CS and UCS), and a Bifactor Model (with a general self-compassion factor and orthogonal specific factors). The Bifactor Model provided the best overall fit, as indicated by goodness-of-fit indices and Likelihood Ratio Test results. However, the general factor explained most of the variance, with minimal contribution from the specific factors, raising concerns about overfitting. This suggests that a simpler unidimensional solution may provide similar explanatory power without added complexity. This provides further support for Neff’s hypothesis that CS and UCS are inversely related not only at the trait level but also at the state level.

In our longitudinal field study involving 494 participants over three months, we found support for the BCH. Various contextual factors affected CS and UCS in inversely related ways, with similar effect sizes, suggesting a symmetrical interplay between different dimensions of self-compassion in response to contextual stimuli. Notably, negative affect and decentering emerged as the most influential factors. Negative affect exerted symmetrical yet inverse influences on CS and UCS, reinforcing the bipolarity of the construct. In contrast, decentering showed a stronger positive association with CS and a more pronounced negative association with UCS. This suggests that mindfulness practices (as reflected by decentering) enhance compassionate self-responding and reduce uncompassionate self-responding, with a stronger impact on reducing self-criticism than on increasing self-compassion.

These findings underscore key distinctions in how negative affect and decentering influence the bipolar relationship between CS and UCS. While negative affect impacts CS and UCS symmetrically, decentering's influence is more strongly weighted toward reducing UCS, creating an imbalance in the relationship between CS and UCS, which is not entirely consistent with the BCH in quantitative terms. However, qualitatively, the results align with the BCH.

In contrast, the level of unpleasantness of events had only modest and inconsistent relationships with both CS and UCS, suggesting that broader emotional and cognitive factors, such as negative affect and decentering, play more influential roles in shaping state self-compassion.

The association between negative affect and self-compassion has been explored in several previous studies (citations). Consistent with our findings, Neff et al. (2021) reported that higher momentary SC was negatively associated with lower negative affect at the same time point in a laboratory setting. Similarly, Mey et al. (2023) found that CS was negatively correlated with negative affect, while UCS showed a positive correlation. These studies suggest that SC might act as a protective factor against negative affect or internalizing symptoms, focusing primarily on how negative affect influences momentary SC. However, our study also found evidence of a reciprocal relationship, indicating that the connection between SC and negative affect is more complex than previously assumed. While SC may function as a buffer against negative affect, our results suggest that experiencing unpleasant events or heightened emotional states can also influence state SC. Unlike trait SC, which is relatively stable, state SC fluctuates considerably in response to contextual factors such as negative affect.

This highlights the importance of considering both the protective role of SC and its vulnerability to situational influences when investigating its relationship with negative emotions.

Regarding decentering, our findings show that it is more strongly negatively correlated with UCS than positively correlated with CS, with a notably stronger association with UCS. These results align with previous studies that have found the negative components of SC (such as UCS) are more strongly related to negative indicators of well-being, including perceived stress, rumination, and neuroticism (López et al., 2015). Given that low decentering reflects a higher tendency toward rumination or over-identification, our results are consistent with the existing literature. Additionally, these findings resonate with critiques of the BCH (e.g., Muris), suggesting that the relationship between decentering and SC components may be more complex than a purely bipolar model suggests.

Our findings also demonstrated how stress and personal relevance, particularly around exam dates, influence state self-compassion. Before exams, students showed a significant decrease in CS and an increase in UCS, consistent with the BCH. After exams, this pattern reversed, with a resurgence of CS and a decline in UCS. This dynamic response pattern further supports the adaptability of state self-compassion to varying stress levels (see also Ferrari et al., 2022).

Our results highlight the critical role of context in shaping state SC (Biehler & Naragon-Gainey, 2022; Aldao, 2013), supporting the use of EMA methods as a valuable tool for capturing these dynamic, context-dependent processes and offering insights that traditional self-reports might miss.

In summary, our findings support the BCH, emphasizing the dynamic nature of self-compassion and its responsiveness to real-time emotional experiences. Maintaining self-compassion in the face of immediate emotional fluctuations is crucial for effective emotion regulation, with significant implications for both theoretical understanding and practical psychological interventions (citations). These findings primarily reflect a nomothetic approach; however, when taking an idionomic perspective, the support for the BCH weakens. While the BCH holds for most participants, a small subset displayed CS and UCS as independent phenomena. This suggests that for some individuals, the BCH may not fully apply, emphasizing the need for further investigation at the individual level. This also implies that it is important to highlight how group-level results can obscure nuanced individual patterns, suggesting the need for greater application of the idionomic approach in psychological research (Sahadra et al., 2024).

In terms of clinical applications, our findings support the BCH, indicating that increasing CS can reduce psychopathological symptoms (Neff, 2022). While some argue that CS and UCS should be addressed separately in therapeutic interventions (Ullrich-French & Cox, 2020), our longitudinal study suggests that increasing CS naturally decreases UCS. Nonetheless, at the idiographic level, for certain individuals, CS and UCS may need to be treated as separate constructs, indicating the necessity for tailored interventions.

**Limitations and future directions**

The present study exhibits several strengths, notably its use of repeated naturalistic sampling methods to capture dynamic variables within a community-based population, offering nuanced insights into variable fluctuations in natural settings. However, several limitations must be considered when interpreting the results. To begin with, the sample was predominantly drawn from a university community of psychology students, which may not represent the broader public, and its non-clinical nature limits applicability to clinical populations. Indeed, our sample exhibited a stronger presence of the CS component compared to the UCS component (Bayesian Cohen’s d = 1.48). In contrast, clinical populations often exhibit a stronger UCS component. For

## instance, Neff and McGehee (2010) showed that individuals with psychological disorders tend to have higher levels of self-criticism and lower levels of self-kindness, a pattern inverse to what we observed in our study. Therefore, expanding the study of SC to different populations, such as clinical ones, could be useful to clarify the nature of state SC.

Additionally, the study did not consider other potential momentary variables that could influence self-compassion scores and the relationship between CS and UCS. This highlights the need for broader research that includes factors such as mindfulness (Biehler & Naragon-Gainey, 2022) and rumination (Raes, 2010).

Finally, the study's EMA protocol, which involved once-weekly measurements over three months, contrasts with more intensive typical EMA studies. A more frequent data collection strategy, such as five notifications per day, every day for two weeks, could provide a deeper understanding of variable fluctuations in daily life.

**Data availability.** Data are available at <https://osf.io/8vg3h/?view_only=815fd6e81b8e421e84428ec23b659c95>

**Declarations**

**Ethics statement.** The studies’ protocol received approval from the University of BLINDED Ethical Committee (Prot. n. 0249805) and was conducted in accordance with the principles of the Declaration of Helsinki.

**Informed Consent.** All participants provided their informed consent to participate in the studies.

**Conflict of interest.** The authors declare that they have no conflict of interest.

# References

Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science*, *8*(2), 155–172.

Aldao, A., Sheppes, G., & Gross, J. J. (2015). Emotion regulation flexibility. *Cognitive Therapy and Research*, *39*, 263–278.

American Psychiatric Association, (2013). *Diagnostic and statistical manual of mental disorders: DSM-5(Vol. 5, No. 5). Washington, DC: American Psychiatric Association.*

Bernstein, A., Hadash, Y., Lichtash, Y., Tanay, G., Shepherd, K., & Fresco, D. M. (2015). Decentering and related constructs: A critical review and metacognitive processes model. *Perspectives on Psychological Science*, *10*(5), 599–617.

Biehler, K. M., & Naragon-Gainey, K. (2022). Clarifying the relationship between self-compassion and mindfulness: An ecological momentary assessment study. *Mindfulness*, *13*(4), 843–854.

Carpenter, R. W., Wycoff, A. M., & Trull, T. J. (2016). Ambulatory assessment: New adventures in characterizing dynamic processes. *Assessment*, *23*(4), 414–424.

Caudek, C., Sica, C., Marchetti, I., Colpizzi, I., & Stendardi, D. (2020). Cognitive inflexibility specificity for individuals with high levels of obsessive-compulsive symptoms. *Journal of Behavioral and Cognitive Therapy*, *30*(2), 103-113.

Caudek, C., Sica, C., Cerea, S., Colpizzi, I., & Stendardi, D. (2021). Susceptibility to eating disorders is associated with cognitive inflexibility in female university students. *Journal of Behavioral and Cognitive Therapy*, *31*(4), 317-328.

Colpizzi, I., Berti, C., Sica, C., Alfei, V., & Caudek, C. (2024). Individual Differences in Risk and Protective Factors: The Role of Self-Compassion Components among Emergency Responders. *Behavioral Sciences*, *14*(3), 178.

Dejonckheere, E., Mestdagh, M., Verdonck, S., Lafit, G., Ceulemans, E., Bastian, B., & Kalokerinos, E. K. (2021). The relation between positive and negative affect becomes more negative in response to personally relevant events. *Emotion*, *21*(2), 326–336.

Ferrari, M., Ciarrochi, J., Yap, K., Sahdra, B., & Hayes, S. C. (2022). Embracing the complexity of our inner worlds: Understanding the dynamics of self-compassion and self-criticism. *Mindfulness*, *13*(7), 1652–1661.

Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., & Einstein, D. A. (2019). Self-compassion interventions and psychosocial outcomes: A meta-analysis of RCTs. *Mindfulness*, *10*, 1455–1473.

Fischer, R., Scheunemann, J., & Moritz, S. (2021). Coping strategies and subjective well-being: Context matters. *Journal of Happiness Studies*, 1–22.

Gratz, K., & Roemer, L. (2004). Difficulties in emotion regulation scale (DERS). *Journal of Psychopathology and Behavioral Assessment*, *26*, 41–54.

Haney, A. M., Fleming, M. N., Wycoff, A. M., Griffin, S. A., & Trull, T. J. (2023). Measuring affect in daily life: A multilevel psychometric evaluation of the PANAS-x across four ecological momentary assessment samples. *Psychological Assessment*.

Inwood, E., & Ferrari, M. (2018). Mechanisms of change in the relationship between self-compassion, emotion regulation, and mental health: A systematic review. *Applied Psychology: Health and Well-Being*, *10*(2), 215–235.

Kuranova, A., Booij, S. H., Menne-Lothmann, C., Decoster, J., Winkel, R. van, Delespaul, P., De Hert, M., Derom, C., Thiery, E., Rutten, B. P. F, Jacobs, N., van Os, J., Wigman, J. T. W., & Wichers, M. (2020). Measuring resilience prospectively as the speed of affect recovery in daily life: A complex systems perspective on mental health. *BMC Medicine*, *18*(1), 1–11.

Lai, M. H. (2021). Composite reliability of multilevel data: It’s about observed scores and construct meanings. *Psychological Methods*, *26*(1), 90–102.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*(3), 335–343.

McDonald, R. P. (2013). *Test theory: A unified treatment*. Psychology Press.

McElreath, R. (2018). *Statistical rethinking: A Bayesian course with examples in R and Stan*. Chapman and Hall/CRC.

Mestdagh, M., Verdonck, S., Piot, M., Niemeijer, K., Kilani, G., Tuerlinckx, F., Kuppens, P., & Dejonckheere, E. (2023). M-path: An easy-to-use and highly tailorable platform for ecological momentary assessment and intervention in behavioral research and clinical practice. *Frontiers in Digital Health*, *5*, 1182175.

Mey, L. K., Wenzel, M., Morello, K., Rowland, Z., Kubiak, T., & Tüscher, O. (2023). Be kind to yourself: The implications of momentary self-compassion for affective dynamics and well-being in daily life. *Mindfulness*, *14*(3), 622–636.

Muris, P. (2016). A protective factor against mental health problems in youths? A critical note on the assessment of self-compassion. *Journal of Child and Family Studies*, *25*, 1461-1465.

Muris, P., van den Broek, M., Otgaar, H., Oudenhoven, I., & Lennartz, J. (2018). Good and bad sides of self-compassion: A face validity check of the Self-Compassion Scale and an investigation of its relations to coping and emotional symptoms in non-clinical adolescents. *Journal of Child and Family Studies*, *27*, 2411-2421.

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.

Naragon-Gainey, K., DeMarree, K. G., Kyron, M. J., McMahon, T. P., Park, J., & Biehler, K. M. (2023). Decentering from emotions in daily life: Dynamic associations with affect, symptoms, and well-being. *Clinical Psychological Science*, 21677026221147262.

Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity*, *2*(3), 223–250.

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.

Neff, K. D. (2023). Self-compassion: Theory, method, research, and intervention. *Annual Review of Psychology*, *74*, 193–218.

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*, 121–140.

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.

Trull, T. J., & Ebner-Priemer, U. W. (2020). Ambulatory assessment in psychopathology research: A review of recommended reporting guidelines and current practices. *Journal of Abnormal Psychology*, *129*(1), 56.

Ullrich-French, S., & Cox, A. E. (2020). The use of latent profiles to explore the multi-dimensionality of self-compassion. *Mindfulness*, *11*, 1483–1499.

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