



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

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Accepted: 21 March 2025 / Published online: 11 April 2025
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Abstract

Objectives The Bipolar Continuum Hypothesis suggests that compassionate self-responding (CS) and uncompassionate self-responding (UCS) operate as opposing ends of a dynamic continuum. While this aligns with the view of self-compassion as a synergistic system, some researchers argue CS and UCS may function independently, raising questions about their relationship. This study examined real-time fluctuations in CS and UCS in response to contextual factors, addressing these theoretical and methodological complexities.

Methods Across two longitudinal field studies (Study 1, $n = 326$; Study 2, $n = 168$), 494 participants provided weekly Ecological Momentary Assessment (EMA) data over 3 months. We assessed how immediate emotional states, decentering (a mindfulness-related skill), and event unpleasantness influenced CS and UCS in daily life.

Results Partial support was found for the Bipolar Continuum Hypothesis, with CS and UCS generally showing inverse fluctuations in response to negative affect and decentering. Negative affect was the strongest predictor, linked to higher UCS and lower CS. Decentering showed a stronger association with reducing UCS than increasing CS, suggesting an asymmetry in their interaction. An idiomorphic analysis revealed individual variability, with a subset of participants displaying no clear inverse relationship, or even a positive association, between CS and UCS. Event unpleasantness had a minor impact.

Conclusions These findings partially support the Bipolar Continuum Hypothesis, particularly regarding responses to emotional states, while also highlighting individual differences. Future research could explore the potential benefits of refining interventions and tailoring approaches to account for individual variations in CS and UCS dynamics.

Preregistration This study is not preregistered.

Keywords Self-compassion · Ecological momentary assessment · Contextual factors · Emotion regulation · Decentering · Negative affect

Self-compassion — the ability to respond to one's own suffering and perceived shortcomings with kindness and

understanding — has emerged as a central construct in contemporary psychological research. Since the introduction of the Self-Compassion Scale (Neff, 2003), which has garnered over 10,000 citations, this construct has been extensively and rigorously examined across a wide range of psychological contexts. Despite the extensive research, the theoretical underpinnings of self-compassion remain an active area of debate (Cha et al., 2023).

A key focus of this debate is the Bipolar Continuum Hypothesis (Neff, 2022), which posits that compassionate self-responding (CS) and uncompassionate self-responding (UCS) represent two ends of a single continuum, rather than distinct and unrelated constructs. Within this framework, self-kindness, common humanity, and mindfulness characterize the compassionate pole, whereas self-judgment, isolation, and over-identification define the uncompassionate

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pole. This perspective presents self-compassion as a multidimensional and dynamic system in which CS and UCS interact synergistically to regulate emotional well-being (Neff, 2022, 2023). Supporting this view, psychometric research has demonstrated that the Self-Compassion Scale captures both a global self-compassion factor and six specific subfactors (Neff et al., 2017, 2021).

Neff (2016a, 2016b; Neff & Tóth-Király, 2022) further emphasized that self-compassion operates as a dynamic and interactive system, where the elements of CS and UCS continuously influence each other. The author argued that conceptualizing CS and UCS as entirely separate constructs is a fallacy, advocating instead for the Self-Compassion Scale total score as a unified measure of self-compassion (Neff, 2023). This perspective underscores the integrative nature of self-compassion, challenging dichotomous approaches and encouraging a more holistic understanding of its role in psychological well-being.

Competing theoretical frameworks, however, question this view. Some researchers argued that CS and UCS are distinct psychological constructs rather than polar opposites (Muris & Otgaar, 2020; Muris & Petrocchi, 2017; Muris et al., 2018). This perspective is supported by studies indicating that UCS has stronger associations with psychopathology than CS (Muris, 2016). Additionally, evidence that individuals can exhibit high levels of both CS and UCS concurrently (Ullrich-French & Cox, 2020) poses a challenge to the strict bipolar continuum model, suggesting a more complex relationship between these constructs.

Until recently, research in this area has largely conceptualized self-compassion as a stable trait, reflecting a relatively enduring personality characteristic. However, recent advances have shifted attention towards viewing self-compassion as a dynamic construct that may vary across time and context. This evolving perspective suggests that observational longitudinal studies, as opposed to traditional psychometric approaches, may be more suitable for capturing the nuanced and context-dependent nature of self-compassion (Ferrari et al., 2022; Inwood & Ferrari, 2018), aligning with broader psychological trends that emphasize state-dependent variability over trait stability.

For instance, Krieger et al. (2016) conducted a longitudinal study across three time points following depression treatment, finding that both the Self-Compassion Scale total score and its subcomponents (CS and UCS) were equally predictive of depression outcomes. Although CS and UCS effects differed in direction due to the polarity of the scales, the strength of these effects was comparable, indicating that the total self-compassion score provides a robust representation of the self-compassion construct. These findings align with Neff's Bipolar Continuum Hypothesis. Nonetheless, despite its longitudinal design, the study by Krieger et al. (2016) remains rooted in a trait-based framework.

More recently, Mey et al. (2023) proposed investigating self-compassion as a dynamic, state-level construct that varies with momentary emotional and contextual influences. Through Ecological Momentary Assessment (EMA), they explored the relationship between state self-compassion and well-being, distinguishing between the CS and UCS components, where EMA involves repeated, real-time data collection in participants' natural environments (Trull & Ebner-Priemer, 2020). Their findings showed that high state CS predicted positive affect, whereas high UCS was more strongly linked to psychological distress. These differential effects, which challenge the Bipolar Continuum Hypothesis, emphasize the importance of analyzing CS and UCS as distinct, state-dependent dimensions.

The use of EMA has proven particularly valuable for capturing the temporal dynamics of self-compassion (e.g., Gavrilova & Zawadzki, 2023). Recent studies indicate that fluctuations in momentary self-compassion are predictive of concurrent changes in affect and stress reactivity, with strong links to adaptive outcomes such as increased mindfulness, reduced stress reactivity, and improved well-being (Biehler & Naragon-Gainey, 2022; Ewert et al., 2021; Sahdra et al., 2023). The consistency of these temporal associations supports a reconceptualization of self-compassion as a dynamic process rather than a stable trait. These findings highlight the importance of state-level assessments over shorter intervals to better capture the nuanced role of self-compassion in everyday life.

Despite advancements in understanding the temporal dynamics and variability of self-compassion, significant methodological challenges persist. Many previous studies relied on ad hoc measures, raising questions about the validity of state-level assessments. Moreover, these studies often focused on short time frames, such as seven days (e.g., Mey et al., 2023; Sahdra et al., 2023), which may fail to capture the full complexity of state self-compassion. The use of randomly selected time windows also risks overlooking critical life events that could substantially influence self-compassion dynamics.

To address these limitations, our study employed a 3-month EMA protocol using the validated State Self-Compassion Scale (Neff et al., 2021). This approach represents the first investigation of the Bipolar Continuum Hypothesis within an extended EMA framework. By collecting data across multiple levels – moments, days, and individuals – our design provided a nuanced and naturalistic examination of state self-compassion. Additionally, we explored how significant life events, such as academic exams, shaped self-compassion dynamics among university students.

Our study design, which included one day of notifications per week with five prompts per day, contrasts with the more intensive protocols often used, such as five daily notifications over a single week. The extended time frame

allowed for greater variability in state self-compassion, capturing shifts associated with major life events. Unlike a randomly chosen week, our design intentionally incorporated two academic exams, enabling a comparison of self-compassion dynamics during periods proximal and distal to these stressors. Furthermore, the reduced frequency of notifications helped mitigate participant fatigue (Shiffman et al., 2008), thereby enhancing both data quality and participant engagement.

This study aimed to empirically evaluate the Bipolar Continuum Hypothesis by exploring how situational factors shape the dynamic interplay between the CS and UCS components of state self-compassion. The hypothesis proposes that self-compassion exists on a bipolar continuum, where CS and UCS are distinct yet interconnected aspects of the same multidimensional construct. Changes along this continuum reflect a dynamic balance, with increases in CS corresponding to decreases in UCS, and vice versa.

Importantly, the hypothesis posits that CS and UCS are inherently connected, interacting in ways that reflect their interdependence. While contextual factors may influence CS and UCS differently, their overarching relationship is expected to remain stable. To thoroughly evaluate this hypothesis, it is necessary to determine whether changes in CS and UCS align with the expected dynamics of a bipolar continuum and whether these patterns are consistently observed across individuals and varying contexts.

Building on the conceptualization of self-compassion as a dynamic process proposed by Ferrari et al. (2022), we advanced four specific hypotheses to empirically test the notion of a bipolar continuum in self-compassion, employing an EMA protocol. H1: A purely cross-sectional psychometric analysis conducted at a single time point may be insufficient to determine the dimensionality of self-compassion, as multiple CFA models with distinct theoretical implications can yield comparable goodness-of-fit indices (e.g., bifactor ESEM vs. correlated two-bifactor ESEM; Neff et al., 2019). In contrast, state-level CS and UCS are expected to exhibit distinct temporal dynamics, reflecting moment-to-moment regulatory processes in which increases in one component correspond to decreases in the other, depending on the context. These temporal fluctuations provide a richer and more nuanced understanding of the underlying structure of self-compassion. To rigorously test the Bipolar Continuum Hypothesis, we examined the reliability and the factor structure of state self-compassion using EMA data analyzed through multilevel CFA models, capitalizing on the within-person temporal dynamics captured by this approach.

H2: The Bipolar Continuum Hypothesis posits that the valence of contextual situations should have equal, opposite, and symmetric effects on the two components of self-compassion (CS and UCS) when examined separately. Each component can be modeled independently using a

hierarchical Bayesian regression framework, with predictors representing contextual valence dimensions. If the hypothesis holds, we expected the regression coefficients for CS and UCS to be of comparable magnitude but opposite in sign, reflecting their inherent interdependence within the bipolar continuum.

H3: Contextual stressors or heightened negative affect may intensify the bipolar relationship between CS and UCS by activating self-regulatory mechanisms that sharpen the emotional distinction between these two components (Dejonckheere et al., 2021). Research suggests that emotionally salient events, which bring central personal concerns to the forefront, can amplify affective polarization. In such instances, positive and negative emotional states become more mutually exclusive, functioning as an adaptive mechanism to emphasize the event's importance and direct attention toward appropriate responses. This increased bipolarity helps allocate cognitive and emotional resources to evaluate success or failure regarding the concern, streamlining emotional processing to support effective behavioral responses. Building on this phenomenon, we examined the association between CS and UCS before and after participants encountered a salient event, with varying levels of emotional arousal (high vs. low). According to the Bipolar Continuum Hypothesis, the relationship between CS and UCS should remain stable regardless of fluctuations in emotional arousal, reflecting the inherent balance within the continuum.

H4: The Bipolar Continuum Hypothesis predicts a consistently negative relationship between CS and UCS at the individual level. Any deviations, such as a zero or positive correlation between these components for certain individuals, would directly challenge the validity of the Bipolar Continuum Hypothesis, calling its assumptions into question.

In previous research, hypotheses like those described above had been often evaluated using multilevel models. However, these models have significant limitations that may obscure the temporal dynamics and individual variability inherent in EMA data. One key limitation is their reliance on the assumption of psychological homogeneity, which often treats individual differences as statistical noise or unexplained variance rather than as meaningful information (Sahdra et al., 2024). Additionally, multilevel models tend to aggregate data toward group-level trends, effectively "smoothing out" individual-level heterogeneity and potentially misrepresenting the nuanced within-person associations that unfold over time. This issue becomes particularly problematic when the ergodic assumption – that group-level effects accurately reflect individual-level processes – is violated, leading to a distorted understanding of the underlying dynamics.

To address these limitations, we complemented multilevel model analyses with an idiomorphic approach (Hayes et al., 2022). This approach prioritizes the modeling of idiographic

patterns – those unique to individuals – before attempting to generalize findings to nomothetic (group-level) patterns. Importantly, only nomothetic generalizations that provide incremental value to our understanding of idiographic insights are retained (Ciarrochi et al., 2022, 2024b; Ferrari et al., 2022; Sahdra et al., 2024; Sanford et al., 2022).

To test the four hypotheses outlined above, we conducted two EMA studies. Study 1 investigated the relationships between immediate emotional states, event unpleasantness, and the components of state self-compassion in daily life. Study 2 expanded on this by examining state self-compassion before and after a high-stakes university examination, providing a naturalistic context to explore how self-compassionate responses vary with situational demands (see also Scott et al., 2024, for related research on stress and self-compassion).

Additionally, Study 2 incorporated a measure of decentering (Biehler & Naragon-Gainey, 2022; Naragon-Gainey et al., 2023; Xie, 2023) — a core mindfulness process involving the ability to observe thoughts and emotions without becoming attached to them (Bernstein et al., 2015). By including decentering, we aimed to investigate its unique effects on CS and UCS, introducing a novel dimension to testing the Bipolar Continuum Hypothesis. Specifically, this allowed us to assess whether decentering exerts differential influences on the two components of self-compassion.

Understanding the dynamic interplay between state CS and UCS has meaningful implications for psychological interventions aimed at enhancing well-being (Körner et al., 2015). By elucidating how situational factors influence real-time self-compassionate responses, this research seeks to advance theoretical understanding of self-compassion and provide robust evidence to inform evidence-based strategies for fostering adaptive self-relations across diverse contexts (Hofmann et al., 2011; MacBeth & Gumley, 2012; Paetzold et al., 2023).

Common Method

Participants

Participants in both studies were recruited from undergraduate and graduate psychology courses at the university via advertisements. Enrollment was entirely voluntary, and no incentives or course credits were offered. Inclusion criteria for both studies required individuals to (1) be at least 18 years of age, (2) possess a proficient level of Italian, (3) have prior experience with smartphones, and (4) report no current or past psychiatric disorders or drug/alcohol addictions. Participants who did not meet a minimum compliance threshold (50% response rate) were excluded from analyses (total $n = 9$).

Procedure

In both studies, participants completed an initial session prior to the EMA phase. During this session, baseline questionnaires were administered to assess trait self-compassion, depression, anxiety, stress, and emotion regulation capabilities. Participants were then trained to use the m-Path mobile application (Mestdagh et al., 2023) on their smartphones. EMA prompts were scheduled to appear 5 times daily at the following intervals: between 10:00–10:30 AM, 3:00–3:30 PM, 5:00–5:30 PM, 7:00–7:30 PM, and 9:00–9:30 PM. The total number of days and any context-specific prompts varied between the two studies (see study-specific Methods for further details).

Measures

The following self-report measures were utilized: Self-Compassion Scale (SCS; Neff, 2003), Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995), Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Additional details regarding scale items, validity indices, and scoring procedures are provided in the Supplementary Information.

During each EMA prompt, participants completed a brief survey assessing the following variables:

Pleasant/Unpleasant Event

Participants rated the emotional valence of the most impactful event since the last notification (or from the start of the day for the first notification) on a 5-point Likert scale (1 = *extremely unpleasant*, 5 = *extremely pleasant*).

Positive and Negative Affect

Four emotional states were assessed using two negative emotion items from the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988; “Nervous” and “Upset”) and two positive emotion items from Kuranova et al. (2020; “Cheerful” and “Satisfied”). Items were rated on a 5-point Likert scale (1 = *not at all*, 5 = *very*). The selected positive items were chosen for their better alignment with the study objectives compared to those in the PANAS. It is important to note that negative affect in this context is distinct from the DSM-5 trait of negative affectivity (APA, 2013).

State Self-Compassion

Measured with the State Self-Compassion Scale–Short Form (SSCS-SF; Neff et al., 2021), augmented by two additional items (1 for CS and 1 for UCS), ensuring at least four items per dimension. Item selection prioritized those with the

highest factor loadings, as identified in a prior factor analysis conducted on a similar sample (Colpizzi et al., 2024). For the CS dimension, the item “At this moment, I am able to accept my flaws and weaknesses” (*In questo momento riesco ad accettare i miei difetti e debolezze*) was added. For the UCS dimension, the item “At this moment, I let myself be carried away by my emotions” (*In questo momento mi lascio trasportare dalle mie emozioni*) was included. All items were rated on a 6-point Likert scale (1 = *not at all true for me*, 6 = *very true for me*). As no validated Italian version of the SSCS-SF was available at the time, the scale was translated into Italian by two independent researchers. Back-translation into English was conducted by a bilingual expert with psychological expertise. Discrepancies between back-translations were resolved, resulting in the final Italian version of the SSCS-SF.

Data Analyses

Hypothesis H1 was tested using multilevel structural equation modeling (SEM) with maximum likelihood estimation in Mplus, employing a two-level (within and between) approach. Data from both studies were combined to enhance sample size and improve parameter precision in confirmatory factor analyses. Hypotheses H2 and H3 were tested using Bayesian multilevel models via Markov chain Monte Carlo (MCMC) methods, specifically Hamiltonian Monte Carlo in Stan (Stan Development Team, 2024). Weakly informative priors were applied, with posterior distributions estimated from at least 2000 samples per chain across 4 chains, following a 1000-step warm-up phase. Model complexity was incrementally increased in a stepwise manner, starting with simple structures and gradually adding fixed and random effects as needed. Model comparison was guided by expected log predictive density (ELPD) using leave-one-out cross-validation (LOO) via the loo R package, with lower LOO values indicating better fit and predictive accuracy. Continuous predictors were standardized to improve comparability and interpretability.

Model evaluation included posterior predictive checks and Gelman-Rubin diagnostics ($R\text{-hat}$ values), ensuring satisfactory convergence ($R\text{-hat} < 1.01$). Error distributions were optimized for posterior predictive performance, and posterior predictive checks confirmed robust model fit. Results are reported as posterior means with 89% credibility intervals (CIs) to align with Bayesian principles, which emphasize estimation over hypothesis testing (McElreath, 2020). Contrasts were calculated to estimate differences between predictor levels, reported with 89% highest posterior density intervals (HPDI). The 89% CI provides a probabilistic interpretation of parameter estimates and was chosen “to avoid confusion with significance tests” (Scelza et al., 2020, p. 25). Additional details on model

specifications, priors, and diagnostics are available in the Supplementary Information.

Hypothesis H4 was tested using a two-stage idiographic analysis. First, an idiographic approach employed a hierarchical Bayesian model in Stan to estimate within-person relationships between UCS and CS for each participant. Second, a nomothetic approach used a hierarchical model in the brms package (R) to identify group-level patterns and quantify variability in UCS–CS associations (e.g., Sahdra et al., 2024). While traditional multilevel modeling separates within- and between-person variance, it can underestimate individual-level heterogeneity due to shrinkage toward the group mean. In contrast, the idiographic framework integrates idiographic and nomothetic perspectives, preserving individual variability while identifying shared patterns. This approach provides a nuanced understanding of individual differences and contextual dynamics in EMA studies.

To ensure data quality, we conducted a thorough assessment to identify inattentive or insufficient effort responses. Metrics included compliance rates, survey completion times, and response variability indices (e.g., Longstring Index, Intra-Individual Response Variability). Participants with compliance rates below 50% were excluded. Momentary lapses in engagement were identified using occasion-level analyses, which flagged < 2% of occasions for potential inattention. Reanalysis of flagged data showed no substantial impact on primary outcomes, confirming the robustness of the dataset (for details, see Supplementary Information).

Study 1: Temporal Dynamics of State Self-Compassion in Daily Life

Study 1 investigated the fluctuations of state self-compassion in response to everyday emotional experiences and challenging events. Specifically, we focused on momentary negative affect (Haney et al., 2023) and event unpleasantness as potential drivers of these fluctuations, examining their impact across multiple temporal scales: within days, between days, and between individuals. According to H2, contextual factors such as negative affect and event unpleasantness should produce opposing effects on the CS and UCS components. Regarding H1, we asked whether the reliability of state self-compassion varies across state (dynamic) and trait (stable) levels. Study 1 tested these predictions through intensive longitudinal assessment of daily experiences.

Method

Procedure

Study 1 examined fluctuations in state self-compassion (CS vs. UCS) across everyday experiences over 3 months. Data

collection occurred on 10 specific days, once per week, and the 5 daily prompts were delivered exclusively on Saturdays via semi-random sampling. On each prompt, participants answered the standard EMA questions on event valence, positive and negative affect, and state self-compassion.

Sample and Compliance

The initial sample consisted of students meeting the specified eligibility criteria. Participants who provided data for at least 4 of the 10 EMA days were included in the final analysis, resulting in a sample of 326 individuals (*mean age* = 24.08 years, *SD* = 7.88). Seven participants were excluded for failing to meet the 50% response threshold. Compliance was high, with participants responding to 85% of daily prompts and completing an average of 8.7 out of 10 study days.

Results

Multilevel Reliability

To assess the reliability of the State Self-Compassion Scale and its components (CS and UCS), we conducted a multilevel reliability analysis using the procedure proposed by Lai (2021). For the CS component, the between-subject reliability ($\hat{\omega}^b$) was 0.82, indicating the scale's robustness in capturing stable individual differences. Within-subject reliability ($\hat{\omega}^w$) was 0.63, reflecting moderate consistency across measurement occasions and the dynamic nature of self-compassion as a state. The composite reliability (ω^{2L}) for CS was 0.79, demonstrating the reliable integration of between- and within-subject variabilities. Similarly, for the UCS component, the between-subject reliability was high ($\hat{\omega}^b = 0.88$), within-subject reliability was slightly higher than CS ($\hat{\omega}^w = 0.68$), and the composite reliability was robust ($\omega^{2L} = 0.83$). These findings suggest that the scale is effective in capturing both stable individual differences and dynamic, context-dependent fluctuations in self-compassion over time.

Correlations Between the CS and UCS Components

This analysis examined the relationship between the components of state self-compassion (CS and UCS) at both trait and state levels, providing a preliminary test of the Bipolar Continuum Hypothesis. At the trait level, using the Self-Compassion Scale administered at the study's onset, a robust *t*-distribution-based analysis revealed a strongly negative correlation between CS and UCS ($r = -0.66$; 89% CI $[-0.73, -0.60]$). At the state level, a multilevel analysis accounting for the nested structure of the EMA data

(measurements nested within days and days nested within participants) indicated a moderately negative correlation between CS and UCS ($r = -0.48$; 89% CI $[-0.49, -0.47]$). However, the lagged correlation between state CS at a given time point and state UCS at the immediately preceding time point was considerably weaker ($r = -0.10$; 89% CI $[-0.12, -0.08]$).

Impact of Contextual Influences on CS and UCS

To test H2 and further evaluate the Bipolar Continuum Hypothesis, we applied Bayesian hierarchical models with CS and UCS as dependent variables. These models accounted for variance at three levels: between individuals, between days, and within days. Predictors included negative affect and event unpleasantness, each centered at the momentary, daily, and person levels, allowing for a nuanced examination of how contextual factors influence CS and UCS oppositely across temporal contexts.

Negative affect exerted strong and opposing effects on CS and UCS at all levels. Higher negative affect was consistently associated with decreased CS and increased UCS, supporting the Bipolar Continuum Hypothesis prediction of symmetric, inverse changes in the two components. For CS, the moment-level effect was $\hat{\beta} = -0.24$; 89% CI $[-0.25, -0.23]$, day-level $\hat{\beta} = -0.26$; 89% CI $[-0.27, -0.25]$, and person-level $\hat{\beta} = -0.51$; 89% CI $[-0.57, -0.45]$. For UCS, the moment-level effect was $\hat{\beta} = 0.26$; 89% CI $[0.25, 0.27]$, day-level $\hat{\beta} = 0.31$; 89% CI $[0.30, 0.32]$, and person-level $\hat{\beta} = 0.65$; 89% CI $[0.60, 0.71]$. Notably, the effects were strongest at the person level, indicating that enduring individual differences in negative affect have the most pronounced influence.

Event Unpleasantness, in contrast, had weaker and less consistent effects. For CS, moment-level $\hat{\beta} = 0.04$, 89% CI $[0.03, 0.05]$, day-level $\hat{\beta} = 0.01$, 89% CI $[-0.00, 0.02]$, and person-level $\hat{\beta} = 0.01$; 89% CI $[-0.05, 0.07]$. For UCS, moment-level $\hat{\beta} = 0.00$; 89% CI $[-0.01, 0.01]$, day-level $\hat{\beta} = 0.04$; 89% CI $[0.03, 0.05]$, and person-level $\hat{\beta} = 0.12$; 89% CI $[0.07, 0.17]$. While event unpleasantness had some positive associations, its effects were minor compared to the dominant role of negative affect.

Discussion

The reliability findings provide a critical foundation for evaluating the study's hypotheses. Specifically, the moderate within-subject reliability underscores the importance of capturing state-level fluctuations in state self-compassion, thereby highlighting the limitations of using cross-sectional methods alone (H1). In contrast, the high between-subject

reliability confirms the scale's robustness in distinguishing stable, trait-level differences in self-compassion.

These reliability estimates align with H2, suggesting that state self-compassion is highly context-dependent and shaped by transient factors. The moderate within-subject reliability points to the dynamic interplay of CS and UCS components, paving the way for investigating how emotional arousal (H3) and individual differences in the CS–UCS relationship (H4) shape self-compassion.

The correlation analyses further support the Bipolar Continuum Hypothesis by revealing a strong negative correlation between CS and UCS at the trait level ($r = -0.66$) and a more moderate one at the state level ($r = -0.48$). This discrepancy implies that while self-compassion tends to function as a bipolar construct overall, it can exhibit greater flexibility in real-time. Notably, the weak lagged correlation ($r = -0.10$) suggests that these momentary fluctuations are shaped by immediate emotional and situational cues.

Contextual factors shed additional light on these dynamics. Negative affect emerged as the primary driver of symmetric, opposing changes in CS and UCS, with stronger effects evident at the person level. These findings indicate that enduring individual differences in negative affect substantially influence state self-compassion across time and contexts. By comparison, event unpleasantness showed minimal effects, implying that internal emotional states may matter more for shaping state self-compassion than do external evaluations of specific events.

In summary, Study 1 underscores the importance of considering both stable and fluctuating aspects of state self-compassion. The findings support the bipolar structure proposed by the Bipolar Continuum Hypothesis and highlight the role of negative affect in guiding CS and UCS. Collectively, these results affirm the need to account for dynamic emotional states when examining state self-compassion, reinforcing the notion that it is both an internally driven and context-sensitive phenomenon.

Study 2: State Self-Compassion Dynamics in High-Stress Environments

High-stress environments offer a critical test of the Bipolar Continuum Hypothesis, as stress may affect CS and UCS differently. While stress is generally thought to decrease CS and increase UCS (Neff, 2003), recent findings suggest that both components can be elevated under extreme stress, as seen in cancer patients (Wei et al., 2023) and also in some individuals in the general population (Ullrich-French & Cox, 2020). These findings challenge the view of CS and UCS as strict opposites, suggesting they may co-occur under high stress. This aligns with emotion regulation theories, which propose that multiple regulatory processes can be activated

simultaneously in response to stress (Aldao & Nolen-Hoeksema, 2013; Gross, 2015). Conversely, high stress levels may increase the typical inverse association between CS and UCS, as proposed by Ferrari et al. (2022). Study 2 thus examines whether CS and UCS maintain an inverse relationship in high-stress contexts or function as distinct, co-occurring responses, exploring whether the dynamics observed in Study 1 hold under more challenging conditions (H3).

Method

Procedure

Study 2 explored whether the inverse relationship between CS and UCS observed in daily life (Study 1) holds under high-stress conditions. The EMA protocol spanned 16 days (over ~3 months), with the same five daily prompts delivered on Saturdays.

Crucially, 4 of these 16 days incorporated context-specific notifications around a known stressor — academic exams — to capture responses in the moments immediately before and after the stressor. We divided the study period into three phases: Pre-exam phase (immediately before the exam); Post-exam phase (immediately after the exam); Distant time point phase (later in the semester, when the stressor was less salient). Beyond the standard EMA items (pleasant/unpleasant events, affect, and state self-compassion), Study 2 included four decentering items (adapted from Biehler & Naragon-Gainey, 2022). These items probed participants' capacity for detached self-observation, theorized to influence how they respond to stress and potentially moderate the relationship between CS and UCS.

Sample and Compliance

Participants were recruited from the same pool and met the same eligibility criteria as in Study 1. The final sample included 168 participants (*mean age* = 19.6 years, *SD* = 1.9), with two participants excluded for failing to meet the 50% compliance threshold. On average, participants responded to 82% of daily prompts and completed 72% of the 16 total study days.

Results

Impact of Academic Exam Stress on State Self-Compassion

This analysis investigated the contextual effects of academic exam stress on the components of state self-compassion, CS and UCS, as hypothesized in H3. We applied

two hierarchical Bayesian models to assess changes in CS and UCS across three key time periods: the day before an academic exam (pre-exam), the day after the exam (post-exam), and a baseline period (non-exam days). These models accounted for the hierarchical structure of the EMA data, which included repeated measures collected across multiple days and times. Specifically, the dataset comprised 12 administrations across separate days (with 5 notifications per day) compared to a single notification collected on the evening following the exam.

To examine the influence of stress, the study period was divided into three distinct phases: (1) Pre-exam phase: Captures the anticipatory stress period the day before the exam. (2) Post-exam phase: Reflects the recovery period the day after the exam. (3) Baseline phase: Represents typical non-exam days, serving as a control. We hypothesized that CS would decrease, and UCS would increase during the pre-exam phase due to heightened stress. Conversely, we expected these trends to reverse symmetrically in the post-exam phase, consistent with the Bipolar Continuum Hypothesis. In the Pre-exam phase, CS decreased relative to baseline, $\hat{\beta} = -0.29$; 89% CI $[-0.51, -0.08]$, indicating reduced self-compassion; UCS increased relative to baseline, $\hat{\beta} = 0.66$; 89% CI $[0.38, 0.95]$, reflecting heightened self-criticism. In the Post-exam phase, CS rebounded above baseline, $\hat{\beta} = 0.23$; 89% CI $[0.02, 0.45]$, suggesting recovery of self-compassion; UCS decreased below baseline, $\hat{\beta} = -0.67$; 89% CI $[-0.95, -0.39]$, indicating reduced self-criticism.

These results reveal opposing but symmetric trends in CS and UCS across the pre- and post-exam periods. The observed patterns align with the Bipolar Continuum Hypothesis, showing that academic stress disrupts the balance between self-compassion and self-criticism in a predictable manner, with subsequent recovery once the stressor is removed (H3). The findings emphasize the dynamic and context-sensitive nature of state self-compassion (Fig. 1).

Impact of Contextual Influences on CS and UCS

This analysis investigated how negative affect, decentering, and event unpleasantness influenced state self-compassion components (CS and UCS), using data from both exam-related and unrelated moments to explore a wide range of contextual variability. The analysis paralleled Analysis 3 of Study 1 and tested H2, which posits that contextual factors exert equal and opposite effects on CS and UCS, consistent with the Bipolar Continuum Hypothesis.

Separate Bayesian hierarchical models were used for CS and UCS as dependent variables, sharing the same structure

but differing in the outcome variable. Fixed effects included negative affect (emotional distress), decentering (the ability to observe one's thoughts without becoming overwhelmed), and event unpleasantness (subjective evaluation of negative experiences). Predictors were centered at three levels — person (inter-individual differences), day (variations between days), and moment (within-day fluctuations). Random intercepts for participants and days accounted for the hierarchical data structure. Predictors were scaled for consistent interpretation across levels. Model specifications are provided in the Supplementary Information.

Negative affect was negatively associated with CS (person-level $\hat{\beta} = -0.31$; 89% CI $[-0.40, -0.22]$; day-level $\hat{\beta} = -0.17$; 89% CI $[-0.18, -0.15]$; moment-level $\hat{\beta} = -0.13$; 89% CI $[-0.14, -0.11]$) and positively correlated with UCS (person-level $\hat{\beta} = 0.33$; 89% CI $[0.25, 0.41]$; day-level $\hat{\beta} = 0.16$; 89% CI $[0.15, 0.18]$; moment-level $\hat{\beta} = 0.14$; 89% CI $[0.13, 0.15]$). Decentering positively influenced CS (person-level $\hat{\beta} = 0.20$; 89% CI $[0.12, 0.27]$; day-level $\hat{\beta} = 0.12$; 89% CI $[0.11, 0.13]$; moment-level $\hat{\beta} = 0.08$; 89% CI $[0.07, 0.09]$) and negatively influenced UCS (person-level $\hat{\beta} = -0.36$; 89% CI $[-0.43, -0.30]$; day-level $\hat{\beta} = -0.22$; 89% CI $[-0.23, -0.21]$; moment-level $\hat{\beta} = -0.15$; 89% CI $[-0.16, -0.13]$). Event unpleasantness showed minimal impact on both CS and UCS. These inverse effects of negative affect and decentering on CS and UCS support the Bipolar Continuum Hypothesis.

Levels of Personal Concern and Stress

The third analysis investigated whether the inverse relationship between CS and UCS remains stable across contexts with differing stress levels, specifically high-stress (pre-exam) and low-stress (baseline) contexts, as hypothesized in H3. A multivariate multilevel Bayesian model with random slopes and intercepts at multiple levels (participant, day, and within-day occasion) was applied to estimate the correlation between CS and UCS across these contexts. The model incorporated stress levels as predictors and allowed for heteroscedasticity by modeling the residual standard deviation as a function of stress context.

In high-stress situations (e.g., pre-exam), the CS-UCS correlation was strongly negative ($r = -0.70$; 89% CI $[-0.76, -0.62]$) and remained similarly negative post-exam ($r = -0.70$; 89% CI $[-0.78, -0.59]$). In a low-stress baseline context, the CS-UCS correlation was also negative ($r = -0.79$; 89% CI $[-0.95, -0.60]$). Overlapping credible intervals across stress levels suggest that the inverse CS-UCS relationship is stable, supporting the Bipolar Continuum Hypothesis.

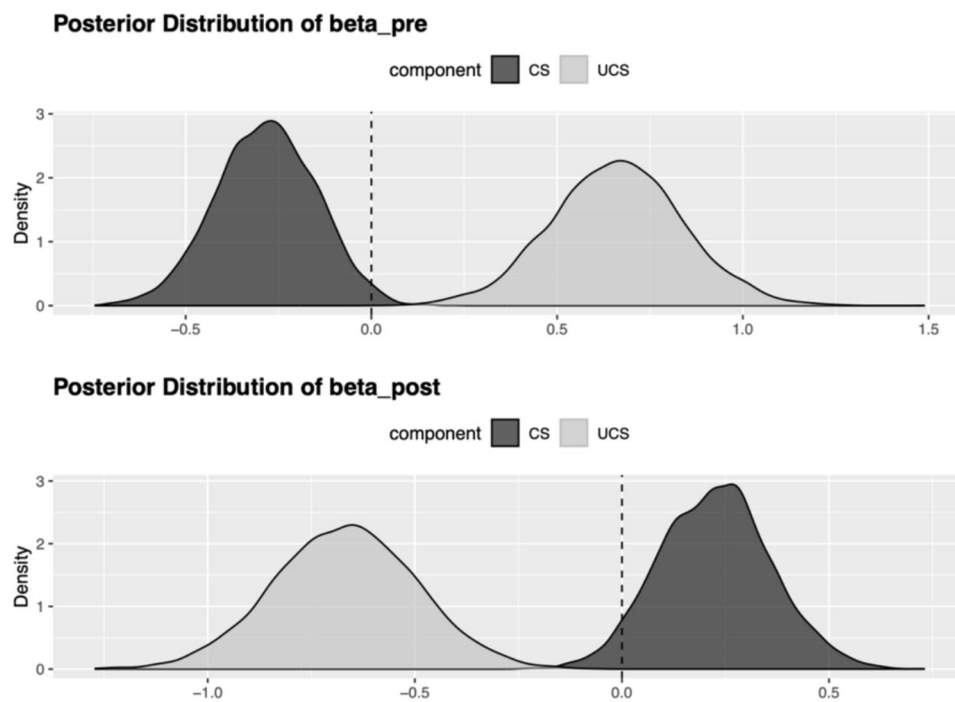


Fig. 1 Study 2: Posterior distribution of CS and UCS components before and after exam days. Top panel: This panel illustrates the differences in self-compassion levels, both CS and UCS, on the day before an exam relative to typical non-exam days. The differences were calculated by subtracting the self-compassion 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

Decentering and the CS-UCS Relationship

This analysis tested whether decentering, a mindfulness process promoting non-judgmental awareness, moderates the inverse relationship between CS and UCS (H2). Decentering was hypothesized to strengthen this relationship by enhancing CS and reducing UCS, suggesting that mindfulness processes contribute to the flexibility of the bipolar structure.

A Bayesian hierarchical regression model predicted UCS as a function of CS, decentering, and their interaction across person, day, and moment levels. Random intercepts and slopes accounted for variability, and a Student *t*-distribution ensured robustness to outliers.

At the person level, the interaction between CS and decentering was negative ($\hat{\beta} = -0.05$; 89% CI $[-0.08, -0.02]$), indicating that higher decentering strengthens the inverse CS-UCS relationship. In contrast, interactions at the day and moment levels were near zero, suggesting that decentering's influence is more relevant to stable, trait-like patterns than short-term fluctuations.

Discussion

Study 2 results provide further support for the Bipolar Continuum Hypothesis, highlighting the role of stress and internal versus external factors. Consistent with the hypothesis, the results revealed that exam stress decreased CS and increased UCS in the pre-exam period, reflecting a shift toward self-criticism. In the post-exam period, CS rebounded and UCS decreased, indicating recovery or enhancement in self-compassion. This opposing response to academic stress reinforces the Bipolar Continuum Hypothesis's prediction of an inverse relationship between CS and UCS, influenced by contextual stress (H3).

The results also revealed that internal factors, such as negative affect and decentering, had symmetrical but opposing effects on CS and UCS. Elevated negative affect corresponded to reduced CS and increased UCS, while higher decentering was associated with increased CS and reduced UCS across all levels of analysis. This pattern reinforces the Bipolar Continuum Hypothesis by highlighting the

opposing impacts of mood and mindfulness-related traits on self-compassion components. In contrast, event unpleasantness showed minimal impact, suggesting that internal states may have a more robust influence on self-compassion than external situational factors.

We examined the stability of the CS-UCS relationship across high-stress (pre-exam) and low-stress (baseline) conditions (H3). The results showed a stable inverse correlation between CS and UCS, with overlapping credibility intervals across stress levels, suggesting that the inverse relationship is resilient and consistent regardless of stress intensity. This finding aligns with the Bipolar Continuum Hypothesis by supporting a stable, inverse coupling of CS and UCS under varying levels of stress.

We explored whether decentering moderates the CS-UCS relationship. Findings showed that individuals with higher trait-level decentering exhibited a stronger inverse CS-UCS relationship, implying that mindfulness-related traits may enhance the coupling between self-compassionate and self-critical responses. However, this effect was observed only at the person level, with minimal influence at the day and moment levels. This specificity challenges the Bipolar Continuum Hypothesis assumption of a universally fixed inverse relationship by suggesting that individual differences in mindfulness-related traits, such as decentering, may influence the strength of the CS-UCS relationship.

In sum, Study 2 offers strong support for the Bipolar Continuum Hypothesis while highlighting nuanced complexities. Analyses 1 and 3 show a robust and consistent inverse relationship between CS and UCS across varying stress levels, reinforcing the hypothesis's core tenet. Additionally, Analyses 2 and 4 underscore the symmetrical influence of internal factors such as negative affect and trait-level decentering, further validating the dynamic interplay between these components. However, certain results point to potential flexibility beyond the strict Bipolar Continuum Hypothesis framework, notably the limited impact of external factors like event unpleasantness and the nuanced, trait-specific influence of decentering. These findings suggest that while the hypothesis provides a compelling foundation, it may benefit from incorporating broader contextual and individual variability to fully capture the dynamics of self-compassion.

Studies 1 and 2: Examining Multilevel Dimensionality

Building on prior evidence for the Bipolar Continuum Hypothesis in trait self-compassion, we assessed the dimensionality of state self-compassion using multilevel confirmatory factor analysis (H1) applied to the combined datasets from both studies. We compared three theoretical models:

(1) one-factor model positing a single self-compassion dimension; (2) two-factor model distinguishing the CS and UCS components; (3) bifactor model incorporating both a general factor and specific CS/UCS factors.

Results

The two-factor model fit better than the one-factor model ($LRT=1068.792$, $df=5$, $p<0.001$), supporting distinct CS and UCS dimensions, while the bifactor model demonstrated an even better fit ($LRT=506.656$, $df=17$, $p<0.001$). The bifactor model identified a robust general factor — particularly at the between-subject level — indicating that most items reflect a unidimensional construct. UCS-specific items captured unique variance, whereas CS-specific factors showed weaker loadings, underscoring the prominence of a general factor and the unique role of UCS items in explaining individual differences.

Factor intercorrelations in the two-factor model were 0.437 ($SE=0.009$) at the within level and 0.720 ($SE=0.059$) at the between level. Table 1 presents standardized factor loadings for the bifactor model, while Table 2 reports goodness-of-fit indices for the three CFA models. The hierarchical ω values revealed that the general factor explained more variance than the specific factors at both levels. Specifically, at the within level: $\omega_{h,gen}^w = 0.26$, $\omega_{h,cs}^w = 0.10$, $\omega_{h,ucs}^w = 0.04$; and at the between level: $\omega_{h,gen}^b = 0.51$, $\omega_{h,cs}^b = 0.07$, $\omega_{h,ucs}^b = 0.21$.

While the bifactor model provided the best statistical fit, it may overestimate fit (Bonifay et al., 2017), so these results alone do not confirm the Bipolar Continuum Hypothesis. Importantly, multilevel CFA reflects stable, person-level relationships and may not fully capture the dynamic CS and UCS interplay across contexts.

Studies 1 and 2: Idionomic Examination of CS-UCS Relationships

To complement the group-level findings and investigate individual-specific dynamics, we conducted an idionomic analysis (Ciarrochi et al., 2024a, b; Ferrari et al., 2022) on the relationship between CS and UCS, combining samples from both studies. This approach enabled us to capture individual heterogeneity in state self-compassion processes that may be obscured in aggregate analyses (see H4).

Statistical Analyses

These analyses proceeded in two stages. In stage 1, we applied participant-specific hierarchical Bayesian models

Table 1 Standardized factor loadings for multilevel bifactor model

Item	Within-level loadings	Between-level loadings
CS1	0.614	0.86
UCS1	0.579	0.774
CS2	0.327	0.41
UCS2	0.49	0.697
UCS3	0.585	0.819
CS3	0.583	0.781
CS4	0.623	0.935
UCS4	0.21	0.143
CS1 (CS)	0.219	0.215
CS2 (CS)	−0.313	−0.329
CS3 (CS)	−0.009	−0.073
CS4 (CS)	0.246	0.322
UCS1 (UCS)	0.473	0.626
UCS2 (UCS)	0.291	0.378
UCS3 (UCS)	0.31	0.422
UCS4 (UCS)	0.208	0.288

using Stan to estimate the relationship between UCS and CS for each individual, controlling for negative affect, context evaluation, and the lagged effect of CS. For each participant, UCS was modeled as a function of CS at the same observation, with an intercept capturing baseline UCS levels. The primary predictor, CS, was assessed alongside negative affect, context evaluation, and an autoregressive term representing prior CS measurements within the same day. We also included an interaction term between CS and negative affect to test whether the influence of CS on UCS varied by affect levels. The error structure was defined using a Student *t*-distribution to handle potential outliers. Posterior distributions were examined for each parameter to assess the strength and direction of associations at the individual level, focusing primarily on the coefficient associated with CS to determine if higher CS consistently related to lower UCS.

Stage 2 aggregated these individual-level estimates using hierarchical models. This allowed us to determine the proportion of participants showing negative CS-UCS relationships and to estimate the general effects of negative affect, context evaluation, and the CS-negative affect interaction across individuals.

Results

The analysis revealed that 81.0% of participants (89% CI [79.6%, 82.3%]) exhibited a negative relationship between CS and UCS, providing support for the Bipolar Continuum Hypothesis at the individual level. However, considerable variability in these associations ($SD = 1.25$) highlighted that the strength — and, in some cases, the direction — of this relationship differs across individuals, with approximately 19% showing neutral or positive associations.

Negative affect was positively associated with UCS ($\hat{\beta} = 0.38$; 89% CI [0.34, 0.42]), suggesting that higher negative emotional states are linked to greater uncompassionate self-responding. Despite this overall trend, the variability in this effect ($SD = 0.19$) pointed to differences in how participants respond to negative affect, possibly reflecting individual differences in coping mechanisms or emotional regulation. Context evaluation showed a small negative association with UCS ($\hat{\beta} = -0.04$; 89% CI [−0.07, −0.01]), indicating that more positive situational evaluations slightly reduce UCS. Substantial variability in this parameter ($SD = 0.17$) suggested that sensitivity to contextual factors varies between participants. Finally, the interaction between CS and negative affect was minimal, 89% CI [−0.03, 0.00], indicating no credible evidence that negative affect moderates the inverse relationship between CS and UCS.

Discussion

The idionomic analysis offers nuanced evidence for the Bipolar Continuum Hypothesis, showing that CS and UCS exhibit an inverse relationship for the majority of participants. Nevertheless, substantial variability in these relationships suggests that the bipolar structure of state self-compassion is not universal. Approximately 19% of participants showed neutral or positive associations, underscoring the value of idiographic approaches in capturing diverse self-compassion dynamics.

The positive association between negative affect and UCS reinforces the idea that negative emotional states intensify uncompassionate self-responding, though the observed individual differences highlight the role of factors such as coping strategies and emotional regulation capacities. The minimal impact of context evaluation on UCS suggests that

Table 2 Goodness-of-fit indices for CFA models

Model	CFI	TLI	RMSEA	SRMR (Within)	SRMR (Between)	AIC	BIC
One-factor	0.935	0.91	0.05	0.033	0.058	475,881.5	476,195.3
Two-factor	0.972	0.959	0.034	0.024	0.05	474,810.2	475,139.6
Bifactor	0.987	0.971	0.029	0.016	0.031	474,376.7	474,816.0

self-compassion dynamics are more influenced by internal emotional states than by external circumstances.

Importantly, the lack of a credible CS-negative affect interaction challenges the suggestion that emotional states modulate self-compassionate responses (Dejonckheere et al., 2021). Instead, our findings indicate that the inverse relationship between CS and UCS remains stable across varying emotional contexts, suggesting a trait-like underpinning to these components' interaction.

Potential Response Bias

To address whether response bias could explain the positive associations between CS and UCS observed in some participants, we analyzed indices of careless responding, including the Longstring Index, Intra-Individual Response Variability (IRV), Even–Odd Inconsistency Index, Mahalanobis Distance, and time to completion. These metrics were compared across participants with positive UCS-CS associations and those with neutral or negative associations, using data combined from both studies.

The analysis found no credible evidence that response biases accounted for the positive UCS-CS associations. Bayesian multilevel models accounted for the nested data structure, and posterior estimates indicated no reliable differences across indices between the groups (see Supplementary Information for details). This suggests that the unexpected patterns are unlikely to be due to careless or insufficient effort responding.

General Discussion

This study investigated the Bipolar Continuum Hypothesis by examining the dynamic relationship between CS and UCS in real time, drawing on the conceptualization of self-compassion as a dynamic, multidimensional, and adaptive system, as proposed by Ferrari et al. (2022). Recognizing that CS and UCS represent distinct yet interrelated components of a bipolar continuum, we tested four hypotheses addressing their temporal dynamics, contextual modulation, and individual variability. By framing self-compassion as a multidimensional system, we investigated whether CS and UCS respond asymmetrically or synergistically to contextual influences, while maintaining their interdependence. Below, we discuss the findings in relation to these hypotheses, highlighting their implications for the Bipolar Continuum Hypothesis and their relevance for understanding self-compassion as an adaptive, context-sensitive process.

H1 proposed that cross-sectional analyses are insufficient to capture the full dimensionality of self-compassion, as they overlook the dynamic and context-sensitive interplay between CS and UCS. Our findings provide robust support

for this hypothesis. Moderate within-subject reliability ($\tilde{\omega}^w$) highlights the dynamic, fluctuating nature of state self-compassion, while high between-subject reliability ($\tilde{\omega}^b$) confirms its ability to reflect stable individual differences. These findings emphasize the importance of integrating approaches that account for both enduring traits and momentary states. Multilevel CFA findings added structural insights: while the bifactor model provided the best statistical fit, capturing a general factor and distinct CS and UCS dimensions, the two-factor model's simplicity highlighted the relative autonomy of CS and UCS. Together, these results affirm the need to move beyond cross-sectional methodologies to better understand the interplay between stable and dynamic dimensions of state self-compassion.

H2 posited that CS and UCS reflect real-time regulatory processes, exhibiting symmetrical and opposite responses to contextual factors. This hypothesis was strongly supported. Across studies, negative affect was consistently linked to decreases in CS and increases in UCS, aligning with the Bipolar Continuum Hypothesis's predictions of symmetrical regulatory processes. These results show how state self-compassion components shift adaptively in response to emotional demands, primarily shaped by internal states rather than external situational factors. This reinforces the view of state self-compassion as a dynamic system responsive to emotional regulation while maintaining a bipolar structure.

H3 hypothesized that contextual stressors or heightened negative affect would amplify the inverse relationship between CS and UCS. Contrary to this hypothesis, the strength of the CS-UCS inverse relationship remained stable across varying stress levels, even during high-stress periods such as pre- and post-exam phases. This stability challenges prior suggestions that stress heightens bipolarity (e.g., Dejonckheere et al., 2021). Instead, it highlights the robustness of the CS-UCS relationship, which remains consistently inverse across stress contexts. These results suggest that while CS and UCS adapt to stress, their interdependence does not intensify, supporting the Bipolar Continuum Hypothesis's core principle of stability in the bipolar structure.

H4 proposed that the CS–UCS relationship varies across individuals, reflecting distinct patterns in how state self-compassion components interact. This hypothesis was partially supported: while 81% of participants exhibited the expected inverse relationship, consistent with the Bipolar Continuum Hypothesis, 19% showed neutral or positive associations. These findings underscore the importance of moving beyond group-level assumptions and highlight the value of idiographic methods for uncovering individual variability that might otherwise remain hidden.

Additionally, higher trait decentering strengthened the inverse relationship, suggesting that mindfulness-related traits may enhance the coupling between self-compassionate

and self-critical responses. These findings emphasize the importance of frameworks that incorporate individual differences, extending the Bipolar Continuum Hypothesis to accommodate nuanced patterns of self-compassion.

This study highlights the complexities of measuring dynamic systems such as state self-compassion. While the Bipolar Continuum Hypothesis suggests self-compassion exists along a continuum between CS and UCS, our findings show significant variability in this relationship across individuals and contexts, posing challenges for both theoretical understanding and practical measurement.

A key challenge is reconciling the theoretical multidimensionality of self-compassion with measurement approaches. Using a total score on the Self-Compassion Scale, as Neff (2022, 2023) advocates, offers simplicity and captures an overarching self-compassion factor. However, this approach comes at the cost of nuance. Collapsing CS and UCS into a single score risks obscuring their distinct patterns and differential sensitivity to contextual factors, as observed in our findings. It can also reduce predictive power by losing variance compared to analyzing CS and UCS separately. Importantly, combining these opposing components into a single score may overlook asymmetries, such as the effect of mindfulness traits like decentering, which reduced UCS without a proportional increase in CS.

Conversely, analyzing CS and UCS separately offers deeper insights into their distinct roles and interactions. For instance, our findings revealed considerable individual-level variability in the strength and direction of the CS-UCS relationship, which a total score would have masked. However, this approach increases model complexity, highlighting a trade-off between simplicity and depth in self-compassion research.

Beyond measurement, this study underscores the challenges of modeling self-compassion as a dynamic, context-sensitive construct (see also Caudek et al., 2020, 2021; Fischer et al., 2021). Real-life processes are shaped by a complex interplay of traits, situational factors, and moment-to-moment regulatory mechanisms. While EMA is a powerful tool for capturing these dynamics in naturalistic settings, it introduces methodological complexities. Temporal modeling requires addressing issues such as autocorrelation, lagged effects, and within-person variability — factors that complicate interpretation, increase computational demands, and necessitate larger sample sizes to ensure robust statistical power.

The observed variability in CS-UCS associations underscores the importance of personalized approaches in psychological interventions. Rather than adopting a one-size-fits-all strategy, tailored treatments could focus on enhancing CS or reducing UCS based on an individual's specific profile. For instance, individuals with heightened UCS may benefit more from targeted interventions aimed at mitigating

self-criticism, whereas those with low CS might require strategies to cultivate self-compassionate responses. Additionally, the differential impact of mindfulness on UCS suggests that mindfulness-based interventions could be further refined to specifically address self-critical tendencies, particularly in cases where boosting CS proves challenging. These individualized approaches align with contemporary models of psychological care that emphasize flexibility and adaptability to meet unique client needs (Ferrari et al., 2019, 2022; Hayes & Hofmann, 2021; Ullrich-French & Cox, 2020).

Limitations and Future Directions

This study highlights the need for balancing simplicity and nuance when investigating dynamic constructs like self-compassion. While total scores on the Self-Compassion Scale offer practical utility, they may overlook the multidimensional and context-sensitive nature of self-compassion. Approaches integrating the simplicity of total scores with the depth of multidimensional analyses could provide a more robust and theoretically aligned understanding of state self-compassion.

Key strengths of this study include the use of repeated naturalistic sampling within a community-based sample, offering valuable insights into the temporal dynamics of state self-compassion. However, limitations warrant attention. The predominantly student sample restricts generalizability to clinical populations, where UCS is typically higher and CS lower. Expanding research to clinical contexts would enhance understanding of self-compassion dynamics in populations with greater self-criticism.

Moreover, the absence of influential momentary variables like mindfulness and rumination limits the scope of interpretation (Raes, 2010). Including such variables could deepen insights into factors shaping the CS-UCS relationship. Although the weekly EMA protocol minimized participant burden, higher-frequency sampling could capture finer-grained temporal variations and provide a more detailed picture of contextual fluctuations.

Finally, the reliance on Neff's State Self-Compassion Scale reflects an individualistic framework common to Western cultures. Future research incorporating alternative perspectives, such as relational or Buddhist-based models, could enrich our understanding of self-compassion as a culturally influenced construct.

In conclusion, this study provides partial support for the Bipolar Continuum Hypothesis while also recognizing certain limitations, particularly the inter-individual variability observed. These findings underscore the inherent complexity of self-compassion as a psychological construct and highlight the importance of adopting a more nuanced

approach. By combining nomothetic and idiographic methodologies, future research can deepen our understanding of state self-compassion and pave the way for more tailored and effective therapeutic interventions.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12671-025-02567-y>.

Acknowledgements We would like to extend our sincere gratitude to the Editor and the three anonymous reviewers for their insightful and constructive feedback, which significantly enhanced the quality and clarity of this manuscript.

Author Contribution The authors made the following contributions. Ilaria Colpizzi: conceptualization, writing — review and editing, data collection, statistical analyses. Timothy J. Trull: conceptualization, writing — review and editing, statistical analyses, supervision. Claudio Sica: conceptualization, writing — review and editing. Allison M. Haney: writing — review and editing, statistical analyses. Corrado Caudek: conceptualization, writing — original draft preparation, writing—review and editing, statistical analyses, supervision.

Funding Open access funding provided by Università degli Studi di Trieste within the CRUI-CARE Agreement. The authors received no financial support for the study.

Data Availability Data are available at https://osf.io/8vg3h/?view_only=815fd6e81b8e421e84428ec23b659c95

Declarations

Ethics Approval The studies' protocol received approval from the University of Florence (Italy) Ethical Committee (Prot. n. 0249805) and was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent All persons gave their informed consent electronically prior to their inclusion in the study.

Use of Artificial Intelligence The authors utilized ChatGPT to enhance the readability and language of the manuscript during its preparation. Following its use, the authors carefully reviewed and revised the content as necessary, taking full responsibility for the final version of the publication.

Conflict of Interest The authors declare no competing interests.

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