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ORIGINAL PAPER

Emotion Regulation Partly Mediates the Link Between Self-Compassion and Well-Being in Daily Life: Differences Between Overall, Positive, and Negative Self-Compassion

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Abstract

Objectives Increasing evidence suggests that self-compassion (SC) can be understood as a state that fluctuates throughout the day. As with trait-level SC, emotion regulation (ER) has emerged as a mediator between momentary SC and higher concurrent well-being. However, research is in its early stages and focuses on the overall SC score, obscuring possible differences between the positive (SC-Pos) and negative components of SC (SC-Neg).

Methods A 7-day Ecological Momentary Assessment study with six semi-random signals per day was completed by 119 individuals (64 female). With each signal, individuals reported their momentary positive (PA) and negative affect (NA), recent SC, daily hassles, and ER strategies since the last signal (acceptance, reappraisal, social sharing, rumination, distraction, and expressive suppression).

Results Whenever individuals reported higher SC than usual, they applied more acceptance, more reappraisal, and less rumination than usual. These ER strategies partly mediated the link between higher SC and higher PA/lower NA. SC-Pos was connected to more acceptance, reappraisal, and expressive suppression (and partly to more social sharing). These ER strategies mediated the association betwee SC-Pos and PA/NA. SC-Neg was related to more rumination, distraction, social sharing, expressive suppression, and less acceptance and reappraisal, with rumination, acceptance, and reappraisal being significant mediators. SC, SC-Pos, and SC-Neg explained substantial variance in PA and NA beyond ER strategies.

Conclusions Overall SC is connected to momentary well-being in daily life through more adaptive ER. However, SC remains uniquely linked with well-being, emphasizing its prominent role in well-being. The distinction between SC-Pos and SC-Neg may shed some light on the "true protective nature" of SC.

Preregistration This study is not preregistered.

Keywords Self-compassion · Positive self-compassion · Negative self-compassion · Emotion regulation · Momentary affect · Ecological Momentary Assessment

Self-compassion (SC) is described as a "healthy way of relating to oneself in times of suffering" (Neff et al., 2021, p. 1) and involves being kind to oneself when confronted with personal weaknesses or painful experiences (Neff, 2003b). As defined by Neff (2003a), SC encompasses three mutually interacting components. Each of them contains a positive and a negative dimension, resulting in six constituent

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components (Neff et al., 2019). First, SC entails treating oneself with kindness and understanding instead of criticizing oneself in painful moments (self-kindness vs. self-judgment). Second, SC involves recognizing one's experiences and shortcomings as part of the shared human nature rather than as isolating (common humanity vs. isolation). Third, mindful, nonjudgmental awareness allows one to be in the present moment so that one neither avoids nor overly identifies with painful experiences (mindfulness vs. over-identification).

SC seems to be a valuable personal resource when stress arises, supporting individuals in dealing with stressful events kindly and nonjudgmentally and protecting them from being overwhelmed by negative feelings or thoughts about themselves (Leary et al., 2007; Neff, 2003b). Both moderation and mediation analyses found that SC explained and dampened the effects of perceived stress or stressful events on markers for well-being. For instance, in more self-compassionate individuals, the experience of stress was less strongly linked to depression, anxiety, or negative affect compared to less compassionate individuals (e.g., Stutts et al., 2018). In another study focusing on college students, SC emerged as a stronger predictor for well-being than stress and other predictors (Neely et al., 2009).

An underlying psychological process behind this effect may be that individuals with higher SC possess better coping or emotion regulation (ER) strategies to deal with stress or unpleasant events. A recent meta-analysis (Ewert et al., 2021) found that all in all, trait SC was positively associated with adaptive coping strategies and negatively connected to maladaptive coping. In more detail, high vs. low self-compassionate individuals have been found to engage in more acceptance (e.g., Bakker et al., 2019; Neff et al., 2005), to reappraise or positively reframe aversive events more (Neff et al., 2005; Sirois et al., 2015), or to ruminate less about what happened (Bakker et al., 2019; Raes, 2010). Furthermore, SC seems to be associated with less mental disengagement after an adverse event (Neff et al., 2005). The evidence regarding interpersonal ER strategies such as expressive suppression and social support seeking is mixed. For instance, on the one hand, SC appeared to be negatively or unrelated to the suppression of emotional expressions (Bates et al., 2021; Petrocchi et al., 2014), while on the other hand, Muris et al. (2018) even report that adolescents higher in self-kindness, common humanity, and mindfulness were less likely to express their emotions than their low self-compassionate peers. Regarding support seeking, Neff et al. (2005) found no connection between SC and seeking emotional or instrumental social support among students classifying a recent grade as a failure.

In fact, not only are better coping or ER strategies associated with SC, but the application of healthier ER strategies seems to be a central mechanism by which SC benefits mental health or buffers stress effects. In a variety of studies, more adaptive ER (such as more tolerance of negative emotions) or less emotional dysregulation (such as less rumination, worry, or avoidance) partially or fully mediated the relationship between SC and depression (e.g., Bakker et al., 2019; Krieger et al., 2013), anxiety (e.g., Raes, 2010), or PTSD symptom severity (Scoglio et al., 2018). Furthermore, a recent cross-sectional study found that ER mediated the link between SC and several dimensions of well-being, such as positive affect (PA) and negative affect (NA) as well as eudemonic well-being (Ericson et al., 2024). Overall, one can conclude that trait SC is associated with better mental health not only in and of itself but also by facilitating more adaptive ER.

While past studies on SC and ER have mostly treated SC as a stable personality trait, an increasing number of interventional and ambulatory studies indicate that SC may change dynamically over time. For example, interventional studies have numerously demonstrated that an individual's level of SC could be augmented through SC-focused interventions (e.g., Kirschner et al., 2019; Neff et al., 2021). These changes in SC were connected to increases in well-being or health-related outcomes such as lower perceived stress, lower anxiety, and higher life satisfaction on the trait level (e.g., Bluth & Eisenlohr-Moul, 2017; Neff & Germer, 2013). Additionally, changes in SC were associated with increases in PA or decreases in depressed mood or NA on the state level (e.g., Diedrich et al., 2014; Kirschner et al., 2019; Neff et al., 2021). Furthermore, a small number of ambulatory studies that assessed SC as a fluctuating state within a daily diary or Ecological Momentary Assessment (EMA) design found that SC may vary throughout the day or week and that these variations carry substantial benefits for well-being–related outcomes. For instance, when measured several times daily over several days, higher momentary SC was associated with higher PA and lower NA, a lower stress reactivity in terms of attenuated PA decreases or NA increases following the experience of daily hassles (Mey et al., 2023). Moreover, higher momentary or daily SC was related to healthier eating behaviors (Breines et al., 2014; Katan & Kelly, 2021), a better body image (Kelly & Stephen, 2016), less perceived stress (Li et al., 2020), less body dissatisfaction (Thøgersen-Ntoumani et al., 2017), less social physique anxiety (Thøgersen-Ntoumani et al., 2017), and healthier responses to dietary lapses (Thøgersen-Ntoumani et al., 2021) on the same day or in the same moment. All in all, these studies show that SC can not only be understood as a stable personality trait but also as a momentary attitude or state, which entails beneficial and immediate implications for well-being and health.

It seems plausible to assume that one of the mechanisms by which momentary SC carries beneficial and immediate implications for well-being in daily life is the momentary use

of ER strategies, similar to the results found on the trait level mentioned earlier. Adopting a self-compassionate mindset in a given moment may naturally correlate with the concurrent application of specific adaptive ER strategies while counteracting certain maladaptive strategies. For instance, in a moment when you treat yourself with compassion, it may be easier to accept a stressful event or personal failure than in a moment when you are self-critical. Additionally, to generate a self-compassionate attitude in a given moment, one needs to reappraise the situation by altering the focus from negative self-relevant aspects of the situation towards friendlier, nonjudgmental, and more balanced perceptions and by recognizing that the current moment experience is part of the shared human experience. A self-compassionate response following stressful events may also protect from dysfunctional ruminative processes since SC requires an individual to adopt a balanced and kind perspective towards their experience (Neff, 2003b). In fact, the ability to give effective self-support in stressful situations is seen as a key skill to adaptively regulate one's emotions reducing symptoms of mental illness (Berking, 2017).

Accordingly, a recent ambulatory study assessing momentary SC, coping, and well-being three times a day for 7 days found that in moments when individuals treated themselves with more SC, they applied more engagement coping (involving acceptance, positive reinterpretation, and active coping) and less disengagement coping (comprising denial and behavioral disengagement). Increased engagement coping and decreased disengagement coping, in turn, mediated the relationship between SC and momentary levels of PA and NA (even though the indirect effect on NA through increased engagement coping was nonsignificant; Ewert et al., 2022).

In the majority of studies, as well as in the study by Ewert et al. (2022), SC was conceptualized as the average score of all six SC subscales, which is in alignment with the suggested procedure for the trait Self-Compassion Scale (SCS, Neff, 2003a). However, there is ongoing controversy about whether this approach is suitable. While some studies have confirmed the postulated factor structure of six first-order factors (each factor representing one of the components of SC) and one second-order factor (indicating general SC and justifying the creation of a total score, e.g., Neff et al., 2019), an increasing number of factor-analytical studies found two overarching factors instead of one (for an overview, see Muris & Otgaar, 2020, p. 1474): One factor comprised the positive components of SC self-kindness, common humanity, and mindfulness (SC-Pos). The other factor encompassed the negative components of SC over-identification, isolation, and self-judgment (SC-Neg).

This distinction is especially relevant as SC-Neg may be confounded with dysfunctional psychological processes such as self-criticism or worry (e.g., Muris et al., 2021) and has been found to correlate more strongly with psychopathology than SC-Pos (e.g., Muris & Petrocchi, 2017). Consequently, the association between SC and psychopathology may be inflated, obscuring the "true protective nature" of SC (Muris et al., 2021, p. 241). The true protective nature of SC may distinguish which beneficial aspects of SC result from truly treating oneself with kindness and care from those aspects which merely result from a methodological overlap between the negative SC items and psychopathological symptoms and malfunction. As Muris et al. (2021) argues, the inclusion of the negative items impedes the proper evaluation of the benefits of SC (see Muris et al., 2021, for a more detailed discussion on the inclusion of the negative items of the SCS). Thus, it has been advised to distinguish between SC-Pos and SC-Neg besides examining the total score of SC (e.g., Brenner et al., 2017).

There is limited evidence on the links between SC-Pos or SC-Neg and ER. Muris et al. (2019) found higher scores on the negative subscales of the SCS to be strongly connected to higher levels of negative cognitive reactions to daily life problems (such as putting oneself down or experiencing shame) and, weaker but still significantly, to lower levels of positive cognitive responses (such as optimism and perspective taking) in Dutch adolescents. Higher scores on the positive subscales of the SCS were linked to higher levels of positive cognitive reactions and, less powerful but still significantly, to lower levels of negative cognitive responses. Similarly, in another study with non-clinical adolescents, the positive components of trait SC were positively related to adaptive coping styles (such as active tackling or social support seeking) and negatively to maladaptive coping styles (such as passive reacting and expression of emotion). The negative components of trait SC overall exhibited positive connections with maladaptive strategies and negative connections with adaptive strategies (even though the correlational pattern was weaker in size and less consistent, Muris et al., 2018). Overall, on the trait level, SC-Pos seems positively connected to adaptive coping, while SC-Neg shows negative links. To our knowledge, no study has investigated the within-person association between SC-Pos or SC-Neg and (mal-)adaptive ER on the state level.

This study aimed to examine the association between SC and ER on the state level, extending the findings by Ewert et al. (2022) by two aspects: Besides analyzing the total score of SC, we examined the distinct associations between SC-Pos and SC-Neg with ER strategies to draw a more nuanced and potentially less confounded picture of the associations between momentary SC, ER, and well-being, indicated by positive and negative affect, in daily life. Additionally, we included further ER strategies to allow for a broader analysis of SC and ER as well as possible mediation effects regarding the link between SC and well-being on the state level. In more detail, we explored how having treated

oneself compassionately between the prior and the current time point related to the concurrent application of the ER strategies of acceptance, distraction, reappraisal, rumination, social sharing, and expressive suppression.

We selected these ER strategies based on their inclusion in past EMA studies assessing ER strategies such as Brans et al. (2013), Koval et al. (2015), and Pavani et al. (2017). The ER strategy of acceptance was added due to its important role regarding psychological well-being and health (e.g., Lindsay & Creswell, 2019). Each of the selected strategies may be distinctively connected to SC: Mindful acceptance of the situation and one's own faults and weaknesses in that moment of suffering instead of exaggeration and condemnation is considered a prerequisite for acting kind toward oneself and recognizing them within the larger human experience (Neff, 2003b). On the trait level, momentary SC and acceptance are positively linked (Bakker et al., 2019; Neff et al., 2005). Regarding rumination, which resembles over-identifying with negative experiences (Muris et al., 2021), a self-compassionate, mindful stance in a given moment may counteract an individual's tendency to think repetitively about one's problems and ruminate over past events. Accordingly, SC and rumination are negatively connected (Bakker et al., 2019; Raes, 2010). In order to generate a self-compassionate attitude in a given moment, one has to reappraise the situation by altering the focus from negative self-relevant aspects of the situation towards friendlier, nonjudgmental, and more balanced perceptions and by recognizing that the current moment experience is part of the common human experience. On the trait level, SC is positively associated with positive reappraisal (Bakker et al., 2019; Ewert et al., 2021). Furthermore, distracting oneself, i.e., turning one's attention away from one's emotions and thoughts (Gross & Thomson, 2007) or engaging in a different activity (Skinner et al., 2003), seems incompatible with being mindfully aware and accepting of one's current moment experience. Showing SC in a given moment may reduce the need to suppress the expression of natural emotional processes (Bates et al., 2021; Neff, 2003b) and facilitate openly sharing negative emotional experiences with others. However, evidence regarding the last three strategies on the trait level is mixed. We expected SC in a given moment in daily life to be positively associated with the overall adaptive ER strategies of acceptance (Hypothesis 1a), reappraisal (Hypothesis 1b), and social sharing (Hypothesis 1c), and negatively with the overall maladaptive strategies of rumination (Hypothesis 1 d), distraction (Hypothesis 1e), and expressive suppression (Hypothesis 1f). Furthermore, we expected these ER strategies to act as mediators in the association between momentary SC and well-being as indicated by momentary levels of PA and NA (Hypotheses 2a–f). Due to the scarcity of evidence on the associations between SC-Pos and SC-Neg and these ER strategies, no specific hypotheses were formulated regarding SC-Pos and SC-Neg. Additionally, we explored to which extent treating oneself with compassion in a given moment in daily life benefits our concurrent well-being beyond facilitating more adaptive ER.

Method

This paper employs data collected within the LifeStress study, a large longitudinal EMA project exploring the link between daily hassles, resilience, and cardiovascular parameters in everyday life. The study was connected to two extensive longitudinal studies on resilience factors conducted by the Leibniz-Institute for Resilience Research and the University Medical Center in Mainz (for a more detailed description of the two studies, see Kalisch et al., 2020). The LifeStress study consists of up to four 7-day EMA assessment phases approximately every 6 months. Data collection started in July 2018 and ended in November 2022. SC items were included during the study in 08/2019. We only analyzed each participant's first complete EMA phase containing SC items. Parts of the following sections have been described and published in Mey et al. (2023).

Participants

Participants were individuals from the general population recruited via e-mails, letters, and flyers within the two parent studies mentioned above. Data from 119 participants were analyzed for this project. The average age amounted to 31.30 years ($SD = 9.22$ years). Fifty-five (46.22%) identified as male, 64 participants (53.78%) as female, and 0 (0%) as diverse. The level of education was high, with 47 participants holding a university degree, 19 having completed professional training ("Ausbildung"), 46 holding a high-school degree granting entrance to a university ("Abitur"), three having finished a basic secondary school ("Realschulabschluss"), and two participants were high-school students.

Interested participants had to fulfill the following inclusion criteria at the first measurement wave to take part in the LifeStress study: (1) at least 18 years of age; (2) sufficient command of German to follow the instructions and to complete questionnaires; (3) previous experience in using smartphones; (4) no planned significant deviation from the usual daily routine during each EMA phase (e.g., vacation); (5) no consumption of illegal drugs or large quantities of alcohol; (6) no self-reported mental disorders. All participants had undergone structured clinical interviews screening for mental disorders (Mini International Neuropsychiatric Interview; Sheehan et al., 1998) as part of inclusion in the two parent studies. The current state of self-reported mental

health was assessed at the beginning of each EMA phase of the LifeStress study with the General Health Questionnaire (GHQ; Goldberg et al., 1997). The average GHQ score ($M = 16.03$, $SD = 7.61$) indicated a healthy sample.

In total, four participants dropped out during the EMA phase (two due to a lack of time and two due to difficulties regarding the cardiovascular equipment of the study). In the final session, all participants reported that the EMA methodology had not significantly impacted their behavior or internal experiences during the EMA assessment. All participants with compliance rates below 50% were excluded from the analyses, which applied to one participant. Data of two participants were eliminated during the data clearing process, as they only reported daily hassles in one or two signals. They thus only answered ER items in one or two signals throughout their study participation, providing non-meaningful data. Thus, the final sample consisted of $n = 112$. On average, compliance was high, with 90.50% completely answered signals (SD = 10.17%).

Procedure

An overview of the procedure is outlined in Fig. 1. All participants fulfilling the inclusion criteria underwent an introductory session in the laboratory, giving informed consent and filling in some baseline measures. They received study smartphones (model Motorola Moto E; Chicago, IL) and detailed instructions on how to answer the EMA signals. The 7-day EMA began the day after the baseline session. Each day within a 12-hr timeframe (starting at 8, 9, or 10 am, depending on the participant's choice), six semi-random signals were triggered on the study smartphones (trigger times were randomly distributed except for a minimum default time between signals of 60 min; $M = 121.29$ min, $SD = 38.41$). Each signal had to be answered within 30 min (two reminders every 10 min). The EMA application movisensXS (versions 1.4.8–1.5.18, movisens GmbH, Karlsruhe/Germany) was installed on each smartphone and used to implement the EMA protocol.

On the day following the EMA, a final session took place in the laboratory or via telephone while the COVID-19 pandemic was in place. A semi-structured interview was conducted, checking for potential measurement effects of the EMA methodology (among others). Participants were reimbursed with up to 95 EUR for participating in the EMA phase (which included further measures not mentioned in this paper). The exact amount was based on their individual compliance and increased with each completely answered signal and could include "bonuses" for a compliance rate over 80 or 90%.

Measures

Descriptive statistics and within- and between-person correlations are shown in Tables 1 and 2. With each EMA signal, participants completed the following measures.

Daily Hassles Strain

An EMA version of the Mainz Inventory of Microstressors (MIMIS, Chmitorz et al., 2020) was employed to assess experienced daily hassles, which prompted ER questions in

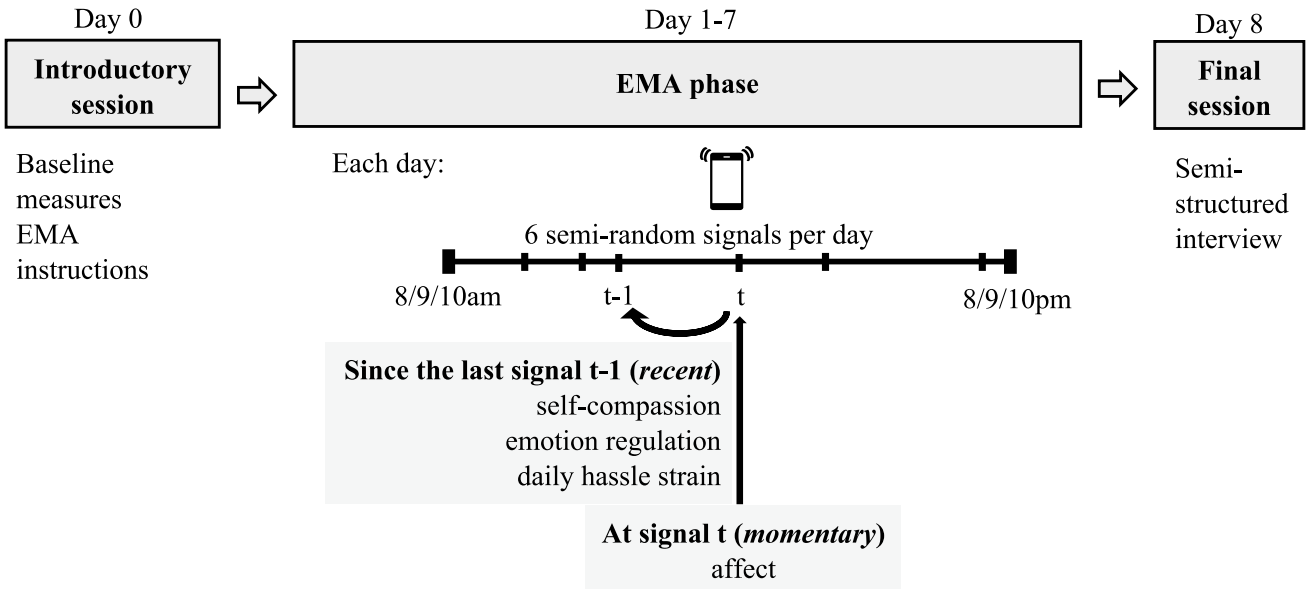


Fig. 1 Overview of the study procedure (adapted from Mey et al., 2023)

Table 1 Descriptive results (mean, standard deviation) and ICCs of the variables

	Computation	Possible range	Actual range	*M* (*SD*)	ICC
1. SC (total score)	Mean of 6 items[a]	0–100	16.83–100	70.75 (13.85)	0.63
2. SC-Pos	Mean of 3 items[a]	0–100	0–100	57.50 (22.63)	0.71
3. SC-Neg	Mean of 3 items[a]	0–100	0–87.33	16.01 (16.41)	0.59
4. Acceptance	1 item	0–100	0–100	70.77 (26.18)	0.36
5. Reappraisal	1 item	0–100	0–100	46.84 (32.80)	0.28
6. Social sharing	1 item	0–100	0–100	34.95 (33.91)	0.23
7. Rumination	1 item	0–100	0–100	31.00 (29.24)	0.29
8. Distraction	1 item	0–100	0–100	34.78 (31.52)	0.48
9. Expressive Suppression	1 item	0–100	0–100	37.35 (30.03)	0.34
10. NA	Mean of 4 items[a]	0–100	0–86.25	11.13 (12.77)	0.43
11. PA	Mean of 4 items[a]	0–100	0.5–100	56.42 (17.36)	0.45
12. Daily hassle strain	Total of strain ratings of 0–58 reported daily hassles[b]	0–232	0–44	2.05 (3.50)	0.40

$n = 112$. Displayed statistics are based on the unstandardized variables and non-aggregated data

SC self-compassion, *SC-Pos* positive components of self-compassion (self-kindness, mindfulness, common humanity), *SC-Neg* negative components of self-compassion (self-judgment, over-identification, isolation), *NA* negative affect, *PA* positive affect

[a]Answering scale of each item: 0–100

[b]Answering scale of each strain rating: 0–4

the following (see below). The MIMIS comprises 58 potential daily hassles from different areas of everyday Life. Individuals were asked to select each daily hassle they had experienced since the last signal. For each daily hassle selected, they subsequently indicated the perceived daily hassle strain on a 5-point Likert scale from 0 (*not at all straining*) to 4 (*very straining*). The daily hassle strain was calculated for each signal by summing up all strain ratings indicated at the respective signal.

Emotion Regulation Strategies

If at least one daily hassle had been reported in the MIMIS, subjects were instructed to refer to the most straining daily hassle and indicate the extent to which they had engaged in the ER strategies acceptance, rumination, positive reappraisal, distraction, expressive suppression, and social sharing in response to this daily hassle. Each strategy was assessed with one self-constructed item (based on Brans et al., 2013; Loch et al., 2011; Pavani et al., 2017; Table 3) and rated on a visual analogue scale ranging from 0 (*does not apply at all*) to 100 (*applies completely*).

Momentary Positive and Negative Affect as Indicators for Well-being

The emotional states of happy, anxious, satisfied, excited, sad, relaxed, depressed, and angry (Kuppens et al., 2010), based on the affective circumplex model of emotions (Russell, 2003), were presented to assess momentary PA and NA. Participants rated to which extent they felt the respective emotion at the current moment on a visual slider scale from 0 (*not at all*) to 100 (*very much*). Mean momentary PA comprised the average of the items happy, satisfied, excited, and relaxed. For mean momentary NA, the remaining four items were averaged. Regarding within-person consistency, we found moderate reliability of McDonald's omega $\omega = 0.69$ for NA and $\omega = 0.78$ for PA, according to Shrout (1998). Between-person reliability was substantial (Shrout, 1998), with McDonald's omega amounting to $\omega = 0.92$ (NA) and $\omega = 0.86$ (PA).

Self-Compassion

Since the State Self-Compassion Scale was published by Neff et al. (2021) after the beginning of our study and no other validated state measure had been available at the time, we self-constructed six items to assess momentary SC (Table 4). Each item represented one of the six subscales of the trait SCS (self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification). For item construction, we chose one item per subscale of the short form (Raes et al., 2011) of the Self-Compassion Scale (SCS, Neff, 2003a) and translated them into German. We based the wording of each item on the respective item of the validated German translation of the long form of the SCS (Hupfeld & Ruffieux, 2011), making slight adjustments to allow implementation within the EMA protocol (e.g., shorter items, time interval since the last signal instead of general moments of suffering). Each item was answered on a slider

Table 2 Within- and between-person correlations of the variables

	Within- and between-person correlations											
	1	2	3	4	5	6	7	8	9	10	11	12
1. SC (total score)	–	0.79***	−0.61***	0.26***	0.18***	−0.03	−0.20***	−0.05**	−0.01	−0.28***	0.28***	−0.10***
2. SC-Pos	0.82***	–	−0.10***	0.24***	0.16***	0.04	−0.05**	0.001	0.07***	−0.11***	0.17***	0.01
3. SC-Neg	−0.51***	0.08	–	−0.13***	−0.13***	0.11***	0.29***	0.08***	0.11***	0.36***	−0.26***	0.18***
4. Acceptance	0.62***	0.63***	−0.14	–	0.30***	−0.08***	−0.24***	−0.06**	0.002	−0.22***	0.26***	−0.18***
5. Reappraisal	0.39***	0.50***	0.08	0.49***	–	−0.02	−0.19***	−0.18***	−0.01	−0.20***	0.26***	−0.26***
6. Social sharing	−0.07	0.16	0.36***	−0.05	0.10	–	0.26***	0.06**	−0.05**	0.14***	−0.05**	0.15***
7. Rumination	−0.33***	0.01	0.59***	−0.24*	−0.20*	0.51***	–	0.14***	0.13***	0.36***	−0.28***	0.34***
8. Distraction	−0.02	0.31***	0.50***	0.10	0.11	0.25**	0.45***	–	0.15***	0.10***	−0.08***	0.09***
9. Expressive suppression	−0.06	0.18	0.37***	0.14	0.14	0.04	0.24*	0.51***	–	0.10***	−0.09***	0.11***
10. NA	−0.43***	−0.03	0.70***	−0.23*	−0.04	0.27**	0.49***	0.38***	0.26**	–	−0.46***	0.34***
11. PA	0.42***	0.44***	−0.06	0.34***	0.44***	0.25**	-0.09	0.06	−0.04	−0.24*	–	−0.34***
12. Daily hassle strain	−0.10	0.02	0.21**	−0.02	−0.15	0.18	0.33***	0.31**	0.14	0.26**	−0.10	–

$N = 112$. Between-person correlations are based on the unstandardized variables, within-person correlations on the within-person standardized values. Within-person correlation are displayed above the diagonal, between-person correlation below the diagonal

SC self-compassion, *SC-Pos* positive components of self-compassion (self-kindness, mindfulness, common humanity), *SC-Neg* negative components of self-compassion (self-judgment, over-identification, isolation), *NA* negative affect, *PA* positive affect

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 3 Items assessing emotion regulation (ER) strategies

Dimension	Item
	Since the last signal…
Acceptance	"…I have tried to accept the event."
Rumination	"…I have thought about the event over and over."
Positive reappraisal	"…I have thought that the event also has positive aspects."
distraction	"…I have distracted myself to stop thinking about the event."
Expressive suppression	"…I have tried not to show my feelings."
Social sharing	"…I have talked with others about the event."

Response scale: visual analogue scale from 0 (does not apply at all) to 100 (applies completely)

Table 4 Items assessing self-compassion (total score, as well as two subscores for SC-Pos and SC-Neg) within each EMA signal

Subscore	Dimension	Item
		Since the last signal…
SC-Neg	Over-identification*	"…I have mainly paid attention to everything that has bothered me about myself."
SC-Pos	Self-kindness	"…I have tried to be understanding and patient towards myself."
SC-Neg	Isolation*	"…I have thought that most other people are probably happier at the moment than I am."
SC-Pos	Common humanity	"…I have thought that it is human to make mistakes."
SC-Pos	Mindfulness	"…I have tried to take a balanced view of things."
SC-Neg	Self-judgment*	"…I have condemned my own faults and weaknesses."

*Items reversed for the SC total score. Response scale: visual analogue scale from 0 (does not apply at all) to 100 (applies completely)

visual analogue scale from 0 (*does not apply at all*) to 100 (*applies completely*). After reversing the items for over-identification, isolation, and self-judgment, we computed a total SC score by generating the mean of all subscales. Additionally, we created separate scores for SC-Pos and SC-Neg by averaging the scores of the respective subscales (SC-Pos: self-kindness, common humanity, and mindfulness; SC-Neg: over-identification, isolation, and self-judgment). Regarding within-person consistency, we found fair parameters (Shrout, 1998) with McDonald's omegas of $\omega = 0.47$ (6 items), $\omega = 0.54$ (SC-Pos), and $\omega = 0.57$ (SC-Neg). Between-person reliability amounted to moderate to substantial parameters (Shrout, 1998) with $\omega = 0.61$ for the complete six-item scale, $\omega = 0.87$ for SC-Pos, and $\omega = 0.90$ for SC-Neg. Correlations between the person means of the scale and the respective scores of the trait SCS (Neff, 2003a), measured during the baseline session, were medium to large according to Cohen (1988) (total score: $r = 0.55$, SC-Pos: $r = 0.51$, SC-Neg: $r = 0.50$).

Data Analyses

All analyses were conducted in Stata 15 (Stata Corporation, College Station, TX, USA). For all analyses, we within-person standardized all predictors and outcomes on Level 1 by dividing the difference between each score of a signal and the person mean of a given variable by the person standard deviation of this variable. Compared to within-person centering (Enders & Tofighi, 2007), within-person standardized variables are better controlled for between-person differences in the estimates, facilitating the interpretation of effect sizes (Wang et al., 2019). Before the following analyses, we excluded all observations containing missing values for the variables included in the respective models so that all analyses were based on the same number of observations. Consequently, only observations in which at least one daily hassle was reported were included, as items assessing ER strategies had only been presented in these observations. From now on, variables that were assessed at signal t but encompassed the interval between the time-points $t-1$ and t will be named "recent" to distinguish them from variables measured at signal t, referring to the very moment of the signal t, which will be designated as "momentary" (see Fig. 1 for clarification). "Prior" indicates lagged variables, referring to the time-point of the signal $t-1$ (please note that we did not create lag variables for the first observations of each day to prevent effects from the previous day).

Hypotheses

We conducted parallel multiple mediation analyses following the three steps postulated by Baron and Kenny (1986) to analyze the association between recent SC and recent ER, as well as the mediating effects of each ER strategy on the association between SC and well-being in daily life. Within the three steps, multilevel models with random intercepts were

designed to capture the hierarchical data structure, with daily signals (Level 1) being nested within participants (Level 2). We did not include random slopes to allow for comparable variance estimations between the models. All models included the following control variables: prior PA (or NA, respectively), recent daily hassle strain, and the signal number across the study (to control for changes over time). We decided against including a lag variable of each ER strategy as using the respective ER strategy at the prior signal was likely aimed at regulating emotional reactivity towards a different prior daily hassle, possibly obscuring the connection between recent ER and recent SC.

The first step (Model 1) of the mediation analyses was conducted separately for each ER strategy according to the following equation, exploring the association between SC (independent variable) and the respective ER strategy (mediating variable), revealing coefficient a and testing the association between recent SC and recent ER.

$$\begin{aligned} ER\,strategy_{ij} = (\beta_0 + u_0) + \beta_1 recent\,SC_{ij} + \beta_2 prior\,PA_{ij} \\ + \beta_3 recent\,daily\,hassle\,strain_{ij} \\ + \beta_4 signal\,number\,(across\,study) + \epsilon_{ij} \end{aligned} \quad (1)$$

ER strategy$_{ij}$ indicates the extent to which a specific ER strategy had been reported by participant j at time point i. $(\beta_0 + u_0)$ denotes the random intercept (thus, the average level of the ER strategy for participant j over all signals, assuming all other variables to be at the person mean). In each model, the coefficient a is represented by β_1, which shows the average association between recent SC and a given ER strategy across the sample. β_2 denotes the link between prior affect and each recent ER strategy. β_3 stands for the association between the ER strategy and recent daily hassle strain. β_4 describes the average slope for the unstandardized signal number across the study. ϵ_{ij} shows the within-person variability.

The second step of the mediation analyses (Model 2) examined the association between SC and PA (or NA, respectively), which is represented by coefficient c (total effect). The following equation was utilized, which is described for PA but applies analogously to NA (controlling for prior NA instead of prior PA).

$$\begin{aligned} PA_{ij} = (\beta_0 + u_0) + \beta_1 recent\,SC_{ij} + \beta_2 prior\,PA_{ij} \\ + \beta_3 recent\,daily\,hassle\,strain_{ij} \\ + \beta_4 signal\,number\,(across\,study) + \epsilon_{ij} \end{aligned} \quad (2)$$

PA$_{ij}$ reflects the level of PA indicated by participant j at time point i. $(\beta_0 + u_0)$ indicates the random intercept, i.e., the average level of PA for participant j over all signals with all other variables at their person mean. β_1 shows the association between recent SC and momentary PA across the sample (coefficient c). β_2 denotes the link between prior affect and each recent ER strategy. β_3 describes the average association between momentary PA and recent daily hassle strain. β_4 shows the average slope for the unstandardized signal number across the study. Again, ϵ_{ij} shows the within-person variability.

The third step (Model 3) investigates the relationship between recent SC and PA (or NA, respectively) while controlling for all ER strategies (see the following equation).

$$\begin{aligned} PA_{ij} = (\beta_0 + u_0) + \beta_1 recent\,SC_{ij} + \beta_2 recent\,reappraisal_{ij} \\ + \beta_3 recent\,acceptance_{ij} + \beta_4 recent\,social\,sharing_{ij} \\ + \beta_5 recent\,rumination_{ij} + \beta_6 recent\,distraction_{ij} \\ + \beta_7 recent\,expressive\,suppression_{ij} \\ + \beta_8 prior\,PA_{ij} + \beta_9 recent\,daily\,hassle\,strain_{ij} \\ + \beta_{10} signal\,number\,(across\,study) + \epsilon_{ij} \end{aligned} \quad (3)$$

As in Model 2, PA$_{ij}$ stands for the level of PA reported by participant j at time point i and $(\beta_0 + u_0)$ reflects the average level of PA for participant j over all signals assuming all variables to be at the person mean. Again, β_1 shows the association between recent SC and momentary PA across the sample. In step 3, however, β_1 represents the direct effect (coefficient c'), which partials out the effect of all ER strategies. β_2 to β_7 represent the average association between each ER strategey and PA (coefficient b). The link between momentary affect and prior affect is described by β_8. β_9 stands for the association between recent daily hassles strain and momentary affect.

The mediation effect of each ER strategy is reflected by the indirect effect ab, which is computed as the product of coefficients a and b. If the indirect effect becomes significant and c' is weaker than c, one can assume a mediation effect of this particular ER strategy on the relationship between recent SC and momentary PA (or NA, respectively). One can conclude partial mediation if c' remains significant and complete mediation if c' becomes nonsignificant (Baron & Kenny, 1986). The bootstrap resampling procedure, which involves repeatedly estimating the indirect effect in subsamples of the dataset, was utilized to generate bias-corrected nonparametric confidence intervals (CI) to examine the significance of the indirect mediation effect. An indirect effect is considered significant if CIs do not include 0 between the lower and upper bounds. In this study, we used 10000 resamples to assess the indirect effects (Preacher & Hayes, 2008).

To examine whether recent SC-Pos and SC-Neg were differently related to each ER strategy and whether the ER strategies differently mediated the association between SC-Pos and SC-Neg and PA or NA, we repeated the above models, replacing recent SC in the previous models 1 to 3 with either recent SC-Pos or recent SC-Neg.

Exploratory Analyses

Additionally, we conducted exploratory analyses investigating to which extent SC explained unique variance in momentary

PA or NA beyond the assessed ER strategies. The amount of uniquely explained variance would indicate to which extent treating oneself with compassion in a given moment in daily life benefits our concurrent well-being beyond facilitating more adaptive ER. For this purpose, we fitted three hierarchical mixed models with random intercepts and slopes to separately predict momentary PA or NA, using within-person standardized variables. In these models, we requested an unstructured covariance matrix (Robson & Pevalin, 2016) and suppressed the constant as it would equal 0, thus not producing any meaningful variance. If model convergence could not be reached, no unstructured covariance matrix was requested. If the model still failed to converge, we omitted random effects one by one (starting with the random effect closest to 0). First, we calculated a null model (Model 4) only containing control variables (recent daily hassle strain, unstandardized signal number, and prior PA or NA).

$$PA_{ij} = (\beta_0 + u_{0i}) + (\beta_1 + u_{1i})prior\ PA_{ij} + (\beta_2 + u_{2i})recent\ daily\ hassle\ strain_{ij} + \beta_3 signal\ number\ (across\ study) + \epsilon_{ij} \quad (4)$$

PA_{ij} denotes the PA reported at time point i by participant j. The intercept β_0 represents the average level of PA reported across subjects. β_1, β_2, and β_3 show the average association between the respective variable and PA at time point i across the sample. u_{0i}, u_{1i}, and u_{2i} are the participant-level random effects, reflecting the extent to which the intercept and slopes differed between participants. ϵ_{ij} indicates the within-person variability.

Second, all six ER strategies were simultaneously added to the null model both as fixed and random effects (Model 5).

$$\begin{aligned} PA_{ij} = {} & (\beta_0 + u_{0i}) + (\beta_1 + u_{1i})prior\ PA_{ij} + (\beta_2 + u_{2i})recent\ daily\ hassle\ strain_{ij} \\ & + \beta_3\ signal\ number\ (across\ study) + (\beta_4 + u_{31})recent\ accep\tan ce_{ij} \\ & + (\beta_5 + u_{4i})recent\ reappraisal_{ij} + (\beta_6 + u_{5i})recent\ social\ sharing_{ij} \\ & + (\beta_7 + u_{6i})recent\ rumination_{ij} + (\beta_8 + u_{7i})recent\ distraction_{ij} \\ & + \beta_9 + u_{8i}\ recent\ suppression_{ij} + \in_{ij} \end{aligned} \quad (5)$$

Again, β_0 is the intercept. β_1—β_9 display the mean association between each variable and PA at time point i across the sample. $u_{0i} - u_{81}$ show the participant-level random effects. ϵ_{ij} reflects the within-person variability.

Third, SC was added to the previous model as a fixed and random effect, according to the following equation (Model 6).

$$\begin{aligned} PA_{ij} = {} & (\beta_0 + u_{0i}) + (\beta_1 + u_{1i})prior + PA_{ij} + (\beta_2 + u_{2i})recently\ hassle\ strain_{ij} \\ & + \beta_3\ signal\ number(across\ study) + (\beta_4 + u_{3i})recent\ accep\tan ce_{ij} \\ & + (\beta_5 + u_{4i})recent\ appraisal_{ij} + (\beta_6 + u_{5i})recent\ social\ sharing_{ij} \\ & + (\beta_7 + u_{6i})recent\ rumination_{ij} + (\beta_8 + u_{7i})recent\ distraction_{ij} \\ & + (\beta_9 + u_{8i})recent\ suppression_{ij} + \in_{ij} \end{aligned} \quad (6)$$

As in the previous models, β_1–β_{10} are the average associations between each variable and PA at time point i. $u_{0i} - u_{9i}$ display the participant-level random effects. $\in_{ij}$ shows the within-person variability.

To investigate whether SC explained additional variance above the assessed ER strategies, we calculated how much of the residual variance of the null model (Model 4) can be attributed to all the ER strategies and to SC. For this purpose, we divided the residual variance of Models 5 and 6 by the residual variance of the null model, subtracting each ratio from 1. Then, we subtracted the amount of null model variance explained by the ER strategies (Model 5) from the amount of null model variance explained by the ER strategies and SC (Model 6), yielding the amount of variance exclusively explained by SC beyond the assessed ER strategies. As a benchmark for interpreting the explained variance measure, we used R^2 values of 0.02, 0.13, and 0.26 as small, medium, and large effects (Cohen, 1988), although these guidelines were developed for OLS regression originally.

To disentangle the amount of PA or NA variance explained exclusively by SC-Pos and SC-Neg, Model 6 was repeated separately for SC-Pos and SC-Neg, replacing recent SC in the previous Model 6 with either recent SC-Pos or recent SC-Neg. The residual variances of these models were compared to the residual variance of Model 5 and the null model, as described in the previous paragraph.

Results

A total of 4700 signals were available for analysis, of which 4254 were completely answered. The remaining 446 signals were missing or incomplete, resulting in an exclusion from further analyses. In 1580 of these signals, participants reported no daily hassle. Thus, 2674 observations include daily hassles and ER items. As lag variables were included in all analyses, only observations with non-missing observations at $t-1$ were included in the models, resulting in the exclusion of 684 observations. Hence, 1990 observations were included in the following analyses.

Hypotheses

An overview of the results of the mediation models (Steps 1 to 3) is illustrated in Fig. 2 (total score first row, SC-Pos middle, and SC-Neg last row). A complete display of the results of the respective multilevel models can be found in Tables S1 to S9 in Supplementary Information.

Results Regarding SC Total Score and ER Strategies

As hypothesized, when participants treated themselves with more compassion than usual when having experienced

a daily hassle, they were more likely than usual to have accepted and reappraised the event and less likely to have ruminated about it. We found SC unrelated to social sharing, distraction, or expressive suppression.

The link between SC and PA/NA was partially mediated by ER strategies (with c' being weaker than c, but remaining significant). Based on the CIs derived with the bootstrapping procedure, we found significant indirect mediation effects of the association between SC and PA/NA for acceptance, reappraisal, and rumination (both regarding PA and NA), but not regarding social sharing, distraction, and suppression.

Results Regarding SC-Pos/SC-Neg and ER Strategies

A different pattern emerged for SC-Neg and SC-Pos: higher SC-Neg was most strongly connected to more rumination and weaker (albeit still significant) to less acceptance and less reappraisal, as well as more social sharing, more distraction, and more expressive suppression (absolute values of the 95% CI of rumination compared to the CIs of the other ER strategies did not overlap indicating the association between SC-Neg and rumination was significantly different from the association between SC-Neg and the other ER strategies). We found acceptance, reappraisal, and rumination to significantly mediate the associations between SC-Neg and NA as well as SC-Neg and PA. The effect was largest for rumination. The link with rumination was significantly stronger for SC-Neg compared to SC-Pos (based on the non-overlap of the absolute values of the 95% CIs between SC-Pos and SC-Neg). Due to the large association with rumination and the large indirect effects of this ER strategy (especially for NA), one can say that the significant indirect mediation effect was largely carried by rumination. As in the total score, c' remained significant, but was smaller than c, hinting towards partial mediation.

SC-Pos was most prominently associated with more acceptance, followed by more reappraisal. To a lesser extent, SC-Pos was also associated with more expressive suppression. In the model predicting momentary NA, SC-Pos was also weakly significantly connected to more social sharing. Absolute values of the 95% CIs of acceptance and the other ER strategies did not overlap indicating that the link between SC-Pos and acceptance was significantly stronger than the links between SC-Pos and the other ER strategies. Compared to SC-Neg, SC-Pos revealed a stronger correlation with acceptance and reappraisal (even though, only for acceptance, the absolute values of the 95% CIs did not overlap between SC-Pos and SC-Neg). Significant mediation effects regarding the associations of SC-Pos and affect were found for acceptance, reappraisal, and expressive suppression (PA) and acceptance, reappraisal, social sharing, and expressive suppression (NA). Due to the large association with acceptance and reappraisal and the large indirect effects of these ER strategies, the significant indirect mediation effect was largely carried by acceptance and reappraisal. Again c' remained significant for both PA and NA, but was smaller than c, indicating partial mediation.

Exploratory Analyses

Tables S10, S11, and S12 in Supplementary Information display the results and residual variances of the multilevel models computed to investigate whether SC explained variance in NA or PA beyond the assessed ER strategies.

Explanation of NA/PA Variance by SC Total Score

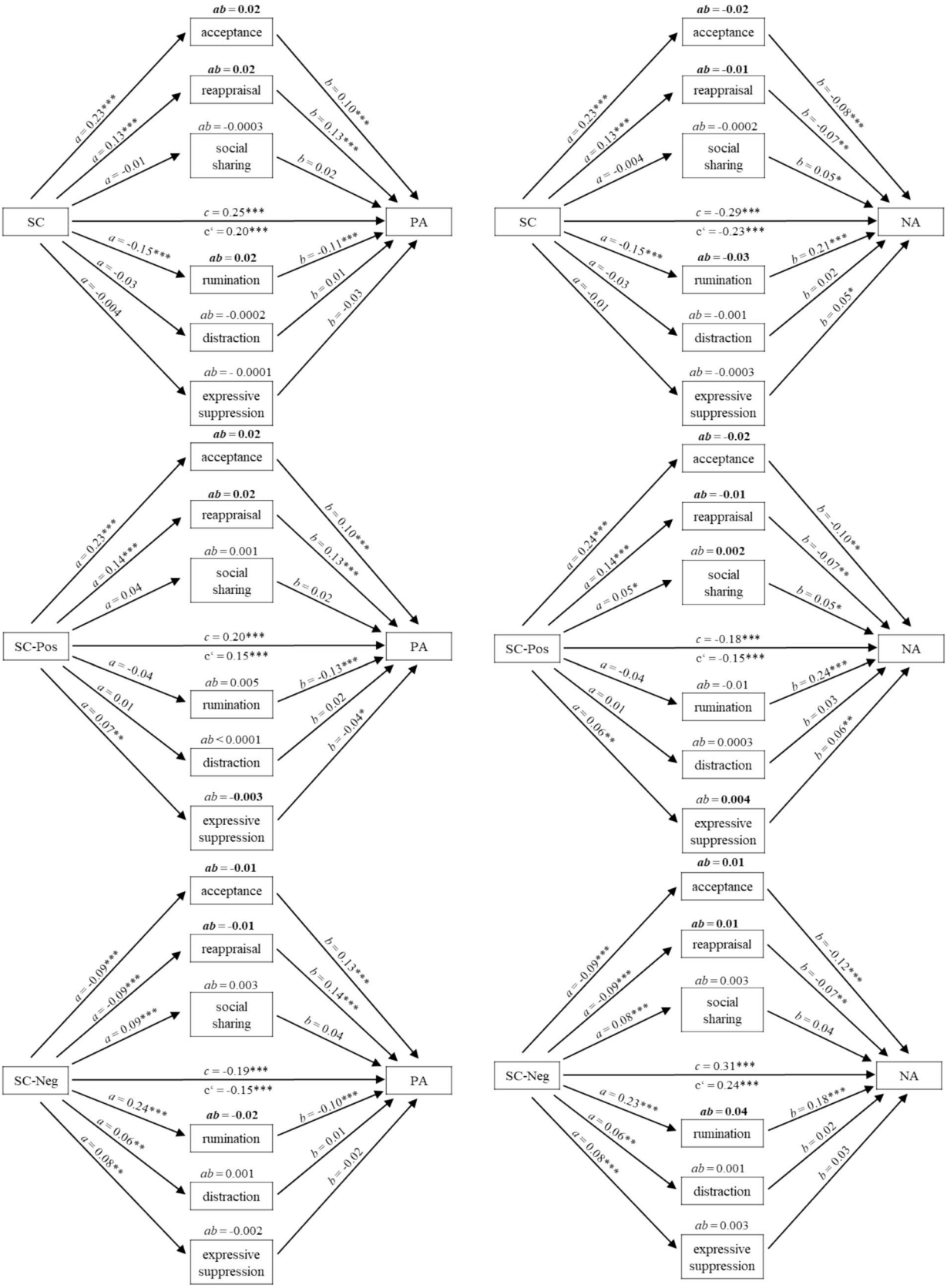
Based on the comparison of the residual variances of the models, we found that the ER strategies collectively explained 13.33% (Model 5), and the ER strategies and SC (total score) together (Model 6) explained 20.41% of the residual NA variance of the null model. Regarding PA, ER strategies accounted for 12.87%, and the ER strategies and SC (total score) accounted for 18.13% of the residual PA variance of the null model. Hence, SC (total score) explained 7.09% (NA) and 5.26% (PA) of the null model variance above and beyond the ER strategies, which are small but significant effects according to Cohen (1988).

Explanation of NA/PA Variance by SC-Pos/SC-Neg

Regarding the sub-scores of SC, we found SC-Pos to explain 4.53% (NA) and 5.12% (PA) of the variance of the null model in addition to the ER strategies. SC-Neg accounted for 8.09% of NA variance above the ER strategies and 3.28% of PA variance of the null model in addition to the ER strategies. Again, these effects are classified as small (Cohen, 1988). To sum up, these results are in line with the results of the mediation analyses, indicating that treating oneself with compassion in a given moment in daily life is uniquely associated with one's emotional well-being (with NA more than with PA) beyond correlating with more adaptive ER strategies. While SC-Pos is similarly connected to PA and NA after controlling for ER strategies, SC-Neg seems to be more relevant for NA than for PA.

Discussion

This study investigated how having recently acted self-compassionately in a particular moment in daily life relates to the concurrent engagement in the ER strategies of acceptance, distraction, reappraisal, rumination, social sharing, and expressive suppression after having experienced a daily hassle. We also explored whether these ER strategies mediated the link between momentary SC and momentary well-being


SC
PA
acceptance
reappraisal
social sharing
rumination
distraction
expressive suppression
c = 0.25***
c' = 0.20***
SC
NA
c = -0.29***
c' = -0.23***
SC-Pos
c = 0.20***
c' = 0.15***
SC-Pos
c = -0.18***
c' = -0.15***
SC-Neg
c = -0.19***
c' = -0.15***
SC-Neg
c = 0.31***
c' = 0.24***

◂**Fig. 2** Overview of the results of the multiple mediation model testing the mediating effects of each emotion regulation (ER) strategy on the relationship between recent self-compassion (SC; total score, positive components, SC-Pos, and negative components, SC-Neg) and momentary positive affect (PA) and momentary negative affect (NA). Displayed statistics on the arrows are the standardized beta-coefficients from the multilevel models representing coefficients *a*, *b*, *c*, and *c*′. The indirect effect of each ER strategy is displayed above the respective ER strategy, with a bold print indicating significant indirect effects. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

(as indicated by PA and NA). Furthermore, we explored to which extent SC explained unique variance in momentary PA or NA beyond the assessed ER strategies.

As hypothesized, we found that when participants had treated themselves with more compassion than usual following a daily hassle, they were more likely to have accepted and reappraised the event and less likely to have ruminated about it. These state-level findings are in line with results reported on the trait level, which show that more self-compassionate individuals report higher levels of trait acceptance (e.g., Bakker et al., 2019; Neff et al., 2005) and reappraisal or positive reinterpretation (Neff et al., 2005; Sirois et al., 2015) and lower levels of trait rumination (Bakker et al., 2019; Raes, 2010). Additionally, they correspond to findings from Ewert et al. (2022), who found momentary SC to correlate positively with momentary acceptance as well as positive reframing (similar to reappraisal).

In this study, recent SC appeared unrelated to distraction, which corresponds to the recent meta-analysis by Ewert et al. (2021). This is also in line with results by Leary et al. (2007), who did not find any difference between high vs. low self-compassionate individuals regarding their tendency to engage in activities to take their mind off the problem. In contrast to our findings, however, negative correlations have been found on the trait level between SC and mental disengagement, which involves distracting oneself in order not to think about the stressor or its implications (Chishima et al., 2018; Neff et al., 2005). These mixed findings may be explained by the fact that distraction itself may be adaptive or maladaptive depending on the exact context of its application, making it more or less conform to a self-compassionate mindset in a given moment. For instance, while distraction has been viewed as counterproductive in some therapy manuals (e.g., Waters & Craske, 2005), it has been found to effectively regulate emotions in a meta-analysis (Webb et al., 2012) or to result in positive outcomes such as higher well-being and positive emotions (Waugh et al., 2020). The adaptiveness of distraction may depend on whether it is combined with an attitude of acceptance or avoidance (Wolgast & Lundh, 2017) or whether one non-avoidantly engages in an activity eliciting positive emotions (positive distraction; Waugh et al., 2020). Thus, when distraction is applied with the underlying wish to avoid the current moment experience, it may contradict a self-compassionate mindset. However, when distracting oneself while not avoiding but accepting the occurred event, distraction may become an act of SC and thus relate positively to it. The one item in our study may have been too general to map possible moderating context factors, resulting in a zero correlation between distraction and SC in this study.

Social sharing and SC were also found to be unrelated in this study. No study has examined the link between sharing and SC yet. However, we may draw on evidence regarding SC and emotional or instrumental support seeking, which involves openly reaching out to others, similar to processes of social sharing. Here, while contradicting a recent meta-analysis (Ewert et al., 2021) revealing a positive connection between SC and seeking instrumental or emotional support, the results of this study correspond to Neff et al. (2005), showing no connection between SC and seeking instrumental or emotional social support on the trait level. Our results support the idea that treating oneself with compassion may rather be an internal process that does not necessarily entail interpersonal assistance (Neff et al., 2005). Moreover, sharing with others may or may not be an act of SC, depending on the exact circumstances, motives of the speaker, and responses of the listener. For instance, when sharing a stressful event with others, one may ruminate together, extensively focusing on the problematic aspects, which may result in negative consequences such as depressive symptoms (e.g., Bastin et al., 2014). In contrast, when the listener offers validation, empathy, or reappraisal of the event, social sharing may yield positive outcomes (Rimé et al., 2020). This somewhat paradoxical nature of sharing was found in past studies as well. For instance, Brans et al. (2013) reported sharing to be related to increases in both PA and NA. Consequently, a more nuanced examination of circumstances may be required to properly map out the different associations this strategy has with SC.

No association between SC and expressive suppression has been observed in this study. On the one hand, the result of this study may seem surprising: As already mentioned, SC has consistently been connected to lower levels of shame (e.g., Ewert et al., 2018) or less perceived self-disclosure risks (Dupasquier et al., 2020). Therefore, it seems plausible to assume that higher SC in a given moment may reduce the need to suppress one's emotion (Bates et al., 2021; Neff, 2003b). Some studies on the trait level support this notion, reporting associations between higher SC and lower expressive suppression (Bates et al., 2021; Jazaieri et al., 2014). On the other hand, other studies showed no or even positive associations between SC and expressive suppression (Ewert et al., 2021; Muris et al., 2018; Petrocchi et al., 2014). This is in line with the findings of this study, which indicate that SC may be, in fact, independent of the expression of one's emotions. Again, this may emphasize the internal nature

of the self-compassionate regulation process (Neff et al., 2005). Additionally, the missing link could also indicate that the association between SC and expressive suppression may differ depending on the exact circumstances in which it is applied. In some situations, it may be an act of SC to show one's emotions while, in other situations, it may be self-compassionate to conceal one's emotions. For instance, when one experiences intense anger towards an occurred stressor, it may not be helpful to vent on this emotion in front of someone else, especially if the stressor is unrelated to this person. In other situations, suppressing one's emotions may also reflect maladaptive motives. For instance, one may decide to conceal one's emotions out of shame for experiencing them, which may result from being self-critical to oneself. Thus, depending on the context and the internal regulation efforts, suppressing one's emotion may present a self-compassionate or uncompassionate response. This is line with our findings regarding expressive suppression and SC-Pos/SC-Neg (see below). Including the negative items in the generation of SC may blur the distinction between the beneficial, self-compassionate effects of suppressing the expression of one's emotions and the maladaptive, uncompassionate effects. Thus, the missing link between the SC total score and expressive suppression may also result from the inclusion of the negative items, not being able to separate uncompassionate from compassionate responding towards oneself.

Furthermore, we found that ER strategies mediated the link between recent SC and concurrent well-being, as indicated by PA and NA, demonstrating that ER strategies may be a pathway through which SC may affect well-being. Thereby, this study replicates the ambulatory study by Ewert et al. (2022), finding that more engagement coping and less disengagement coping in a given moment in daily life mediated the link between SC and momentary levels of well-being. Our results additionally match the trait-level findings from a recent cross-sectional study reporting that emotion regulation significantly mediates the link between several dimensions of well-being, such as positive and negative affect as well as eudemonic well-being (Ericson et al., 2024). This finding also aligns with prior studies on mental health outcomes, such as depression (e.g., Bakker et al., 2019; Diedrich et al., 2017) or PTSD symptom severity (Scoglio et al., 2018).

In more detail, we found that whenever individuals were more self-compassionate than usual following the experience of a daily hassle, they reported higher well-being than usual, which was partly due to having accepted and reappraised the event and having ruminated less about it. Nevertheless, SC uniquely contributed to well-being beyond these ER strategies (as indicated by the partial mediation, suggesting that SC provides mental health benefits distinct from adaptive ER).

This finding was underlined by our exploratory analyses, revealing the amount of variance uniquely explained by SC beyond ER. This finding contradicts some studies reporting a complete mediation of the relationship between SC and depression and stress by avoidance, rumination, or overall ER difficulties (e.g., Diedrich et al., 2017; Finlay-Jones et al., 2015), indicating that SC does not involve unique benefits regarding these outcomes beyond the assessed ER strategies but rather consists of ER strategies which, in turn, are responsible for those benefits. However, our findings suggest that SC uniquely benefits mental health beyond facilitating more adaptive ER, corresponding to other studies which reported partial mediation (Bakker et al., 2019; Raes, 2010) or reported SC to be more effective in decreasing depressed mood compared to acceptance or reappraisal (Ehret et al., 2018). Nevertheless, it is also conceivable that ER could fully explain the link between SC and momentary well-being if further ER strategies were included in the examination.

When distinguishing SC-Pos and SC-Neg, SC-Pos was linked to greater acceptance, reappraisal, and, to a lesser extent, more expressive suppression and social sharing (only when controlled for prior NA instead of prior PA). The association was, by far, strongest for acceptance, followed by reappraisal. SC-Neg, however, correlated strongly with more rumination and, to a lesser degree, with more distraction, more expressive suppression, and reduced acceptance or reappraisal. The association was, by far, strongest for rumination.

Muris et al. (2019) reported a roughly similar pattern of differential correlations of the SC sub-scores with (mal-) adaptive coping strategies: In their study, higher scores on the negative subscales of the SCS (Neff, 2003a) were strongly associated with higher levels of negative cognitive reactions to daily life problems and, albeit less strongly, to lower levels of positive cognitive reactions in Dutch adolescents. The positive subscales of the SCS showed the opposite pattern. The link with negative cognitive reactions was much weaker for the positive than the negative subscales. The distinction between SC-Pos and SC-Neg in this study may shed some light on the "true protective nature" of SC (Muris et al., 2021, p. 241), which is not confounded with psychopathology. Here, we find only SC-Neg to be strongly correlated with rumination, while SC-Pos shows no association, indicating that SC-Pos may not be described by refraining from rumination. Thus, the association between the total score of SC and rumination, which has been widely reported (e.g., Raes, 2010), seems to be carried by the inclusion of the negative items. This result corresponds to Muris et al. (2019) demonstrating that the inclusion of the negative SC items largely carried the relation between SC and psychopathology. Thus, our findings add to the critique raised by other authors that the inclusion of the negative items may result in potential inflation of the relationship between a total SC

score and psychopathology, obscuring the "true protective value of real compassionate self-responding" (Muris et al., 2019, p. 1441). Our analyses on the explanation of NA and PA variance added to this critique: While SC-Pos is similarly connected to PA and NA after controlling for ER strategies, SC-Neg seems to be more relevant for NA than for PA.

Interestingly, SC-Pos and SC-Neg were both positively connected to expressive suppression, distraction, and social sharing (even though for SC-Pos, the association with social sharing was inconsistent). While all ER strategies may be adaptive or maladaptive depending on the context or one's goals, these aforementioned strategies are less clearly assignable to being adaptive or maladaptive, compared to the other ER strategies. They may more heavily depend on the exact circumstances or motives present (as mentioned earlier), thus being in line with both compassionate and uncompassionate self-responding. As mentioned earlier, incorporating the negative items in the generation of SC may mix the beneficial, self-compassionate effects of these ER strategies with the maladaptive, uncompassionate effects.

The link between SC-Pos and affect was partially mediated by acceptance, reappraisal, and expressive suppression for PA, and by acceptance, reappraisal, social sharing, and expressive suppression for NA, with the strongest effect sizes for acceptance and reappraisal. Thus, treating oneself with compassion benefits concurrent well-being mainly by accepting and reappraising the occurred daily hassle to a greater extent. Much smaller but significant indirect effects for expressive suppression and social sharing indicate that SC-Pos was also associated with more expressive suppression and, in parts, with more social sharing, which in turn decreased momentary well-being. Thus, whenever participants treated themselves with more compassion than usual after the experience of a daily hassle, they experienced higher PA and lower NA, partly due to having more strongly accepted and reappraised the event. To a lesser extent, they experienced lower PA and higher NA in moments with higher SC-Pos through having suppressed their emotional expression. Additionally, they experienced higher NA in moments with higher SC-Pos due to having socially shared the event. These results may suggest that one may prefer to conceal one's emotions when treating oneself more compassionately than usual (SC-Pos) in order not to unnecessarily bother others, willingly accepting decreases in well-being. After all, the primary motive for giving oneself compassion is "not to feel better, but because we feel bad" (Germer & Neff, 2019, p. 203). Considering SC as an internal regulatory process independent of social feedback, suppressing one's emotional expression while talking to others about a daily hassle may thus demonstrate a self-compassionate attitude. Overall, however, the sizes of the indirect effects are considerably smaller compared to the indirect effects of acceptance and reappraisal, indicating that this path plays only a minor role in the association between SC and affect.

Regarding SC-Neg, significant partial mediation effects for acceptance, reappraisal, and rumination emerged for both PA and NA. Being harsh toward oneself was associated with lower concurrent well-being, mainly through having ruminated more about the occurred daily hassle and, to a lesser extent, through having accepted and reappraised the event less. Notably, the mediation effects were all partial, suggesting that SC-Pos and SC-Neg remained uniquely connected to concurrent well-being even beyond these ER strategies.

Limitations and Future Research

Certain limitations should be borne in mind when interpreting the results of our study. First, the measure of momentary SC was explicitly developed for this study since no validated measure was initially available. Although the reliability parameters of the overall scale and its SC-Pos and SC-Neg subscales seem low by trait measure standards, it has been suggested to utilize more lenient guidelines for within-person reliability (Nezlek, 2017). Additionally, low omega coefficients for within-person scores may also indicate the sensitivity of the scale to capturing state changes, indicating its validity in measuring momentary states (Medvedev et al., 2017). However, the low reliability may have also underestimated SC scores and reduced the validity of our results.

Moreover, our scale did not explicitly refer to negative experiences. Instead, it assessed a broader self-compassionate attitude to enable a more comprehensive and continuous evaluation of SC within the EMA protocol. Despite the significant correlations observed between our scale and the validated trait version of the SCS (Neff, 2003a), our scale may have inadvertently captured a broader notion of self-warmth or self-acceptance. Additionally, the inclusion of the verb "try" in some of the items (similar to the phrasing of the trait SCS items) may have further concealed associations by not indicating whether individuals succeeded in being self-compassionate. We recommend replicating our findings using a validated measure for momentary SC, such as the State Self-Compassion Scale, recently published by Neff et al. (2021).

Additionally, the scale assessing the ER strategies was devised to fit length requirements of our EMA protocol, including one item per strategy. As mentioned earlier, this assessment may have been too broad to capture all relevant nuances of each ER strategy and its associations with SC.

Another limitation of our study is that we cannot infer any causal effects. It remains unclear whether specific ER strategies are a prerequisite for successfully adopting a self-compassionate attitude or whether engaging in a

self-compassionate response may enhance an individual's capacity to reappraise, accept, and refrain from unproductive rumination. Evidence for both causal directions has been reported (Chishima et al., 2018; Ștefan, 2019). Future intervention studies may clarify causal relationships.

Furthermore, while a comprehensive protocol was documented as part of the application submitted to the ethics committee, and the hypotheses were determined prior to data analysis, we would like to note that our study was not preregistered. We acknowledge that this may raise concerns regarding the risk for potential biases. Lastly, most of the data of this project was collected during the COVID-19 pandemic, which has affected everyday life profoundly. It is possible that it may have also influenced individual levels of self-compassion, affect, and engagement in emotion regulation.

To conclude, we found that treating oneself with compassion in a given moment in daily life overall corresponds to more adaptive and less maladaptive ER, i.e., more acceptance and reappraisal and less rumination. Additionally, we could show that SC is connected to momentary well-being through these ER strategies. The positive and negative components of SC were differently associated with ER, highlighting the importance to separate between the components in order to examine SC without potentially confounding it with psychopathological processes. Thus, we recommend that future research distinguish between the positive and negative components of SC. SC remained uniquely linked with well-being, emphasizing its prominent role for well-being. So, all in all, being kind and compassionate with oneself in a given moment in everyday life has important and immediate benefits for well-being and adaptive emotion regulation.

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Author Contribution Lara Kristin Mey: methodology, formal analysis, investigation, writing — original draft, review and editing, project administration. Karolina Morello: methodology, investigation, project administration, writing — review and editing. Mario Wenzel: formal analysis, writing — review and editing. Zarah Rowland: formal analysis, writing — review and editing. Thomas Kubiak: conceptualization, supervision, funding acquisition, writing — review and editing. Oliver Tüscher: conceptualization, supervision, funding acquisition, writing — review and editing.

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Data Availability Data will be available upon request.

Declarations

Ethics Approval The study was approved by the ethics committee of the State Chamber of Physicians of Rhineland-Palatinate, Germany (reference number 2019-14747_4), and adhered to the ethical standards of the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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

Use of Artificial Intelligence Artificial intelligence tools have not been used.

Conflict of interest The authors declare no competing interests.

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