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Change in emotional processing in daily life: relationship with in-session self-esteem

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Abstract

Background: In-session emotional processing is a central component of psychotherapy, but little is known about the types and the quality of emotional processing individuals engage in in daily life. An ecological momentary assessment (EMA) schedule has been validated to assess distinct emotional experiences as they emerge in daily life (Beuchat et al., 2021). It remains an open question whether change observed in distinct emotional experiences over a week of assessment are related with in-session self-esteem.

Methods: In total, $N = 42$ university students participated in a one-week assessment of emotions using ecological momentary assessment, as well as in a one-session experiential task of resolving self-criticism (using a two-chair dialogue from emotion-focused therapy; Whelton & Greenberg, 2005). The emotions in daily life were self-reported by the participants on a regular basis, and self-esteem was assessed three times during the two-chair dialogue. Two-level hierarchical linear models reveal emotional change in daily life, and in-session self-esteem is introduced as predictor on level 2. In-session self-esteem was correlated with symptom levels.

Results: The results showed that changes in primary maladaptive emotions of the one-week assessment were predicted by state and trait components of in-session self-esteem which took place at the outset of the EMA. Trait-components of self-esteem were linked with the level of symptoms, whereas state-components of self-esteem were not.

Discussion: The present study underscores the importance extending research from within-session observations of emotional processing towards daily lives. By doing so, the present theory-consistent methodology may be used to demonstrate the central role of emotional

processing in daily life as potential mechanism of change of the construction of self-esteem in psychotherapy.

Key-Words: Self-Esteem; Emotional Processing; Change; Ecological Momentary Assessment; Assessment; Experiential

Introduction

Self-esteem is one of the most important concepts in explaining human behavior and is associated with mental health outcomes in various ways (Colmsee et al., 2021; Kling et al., 1999; Kuck et al., 2021; Soto-Sanz et al., 2019). Self-esteem may be defined as the individual's subjective evaluation of themselves to be able to cope with everyday stress resulting in feelings of worth as a person (Branden, 1994; MacDonald et al., 2012). Self-esteem is by far not a stable personality characteristic, but fluctuations over time and a developmental pattern across the lifespan have been observed (Orth et al., 2018) and the impact of self-esteem of a variety of health outcomes, including interpersonal relationships have been demonstrated (Harris et al., 2019). In clinical psychology, counselling and psychotherapy, self-esteem is relevant as a) an explicative variable of level of symptoms and b) as potential resource explaining change across treatment. As such, two aspects of self-esteem can be differentiated: 1) a trait-component prone to explain stable personality characteristics, and 2) a state-component prone to change as a function of intervention and daily interpersonal situations. The distinction between state- and trait-aspects of a phenomenon has already been studied in the context of the differentiation between defense mechanisms and coping (Kramer, 2010) and in the context of changes in the therapeutic alliance (Zilcha-Mano, 2017), and has proven effective.

Individuals' evaluation of their self-worth and capacity to cope is related with a general sense of self, as well as with emotional processing components and specific emotional experiences. In current conceptions based on affective and computational neuroscience, self-esteem appears as a cognitive variable acting as prior in a dynamic situation when the individual is confronted with a stressor (Smith et al., 2020). The notion

of prior in such a model means, in the Bayesian sense, that in each new interaction situation, the individual brings in distilled information (i.e., from earlier, similar interaction situations) in the form of schematic emotional memory. In a situation with low self-esteem (which may be the result of traumatic interaction situations, or repeated experiences of failure in a particular domain), the individual may for example bring into the situation the prior containing the cognition "I am a failure". This prior is then compared with the features of the current interaction situation. Depending on the features of the current interaction situation, the schematic emotional memory may (or may not) be updated (in our example in the positive sense). For example, the individual may experience a new sense of worth in a particularly validating and prizing therapeutic relationship, which contradicts the prior and updates the schematic memory. In the psychotherapy literature, this process has been described as corrective emotional experience (Alexander et al., 1946; Castonguay et al., 2012). It appears that self-esteem, generally conceived as a (rather stable) personality trait variable (Altmann et al., 2018; Kernis et al., 1989; MacDonald et al., 2012; Rosenberg, 1965), may also fluctuate as a function of the momentary situation, thus be captured in a very brief (i.e., few minutes) time-window of assessment (Heatherton & Polivy, 1991; Okada, 2010). This seems particularly promising when studying in-session processes (Kramer et al., 2016) in which experiential tasks may impact the momentary self-assessment of one's sense of worth, and when studying self-esteem in adolescents prone to momentary fluctuations in their self-assessment (Linton et al., 1996), when predicting aggressiveness (Kirkpatrick et al., 2002; Webster et al., 2007), or when studying the links between self-esteem and specific emotional components known to fluctuate, such as loneliness (Fozogpour et al., 2012).

Building on a neuroscientific model of emotional processing, Damasio (2010) distinguished between three types of (increasingly complex and integrated) sense of Self. While Damasio does not explicitly elaborate on the evaluative component of the sense of Self (i.e., the self-esteem), we assume theoretically that momentary self-esteem is best understood as emerging experiential self-organization (Gendlin, 1961; Greenberg, 2019) rooted in the individual's sense of Self. According to Damasio (2010), the protoself manages the proprioceptive information from the body, feeling states, sensations, action tendencies, arousal, together with a sense of being alive. Anatomically, the insula, the brain stem and the sensorimotor cortices are associated with the protoself. Anchored in the protoself is the core self which encompasses the momentary emotional experience and the bodily felt sense containing elements of meaning (i.e., information about needs, goals, action tendencies, affect and feelings). The core self can be paralleled with the meaning-ladden momentary experience (Gendlin, 1961). Anchored in the core self is the autobiographical self which encompasses the individual's life story and the person's footprint in this world as part of a coherent and evolving narrative. The latter incorporates and synthesizes elements of the protoself and the core self and takes a broader bird's eye view on the self, as agent with a body moving, operating and evolving in an environment with a unique history.

Based on these elaborations, self-esteem may be understood as a cognitive - or self-representational - variable which builds on bodily anchored emotional processing in daily life. For clinical psychology, counselling and psychotherapy, it becomes clear that while certain relevant changes may be observed in the interaction between the therapist and the client, others operate in the daily lives of the clients. So far, no studies have attempted to

observe associations between in-session processes of self-esteem – as markers of problematic priors – and emotional processing in daily life which will be the aim of the current work.

While emotional processing has been studied extensively as in-session processing, in particular in emotion-focused therapy (Pascual-Leone, 2018; Pos et al., 2009), emotional processing in daily life has only started to receive due attention, mostly due to the development of new ecological momentary assessment (EMA) modules. Using such methodology, it was shown that emotional processing in daily life may explain suicide ideation and behavior, impulsivity, addictive behaviors and urges to self-harm (Links et al., 2007; Reisch et al., 2008; Scala et al., 2018; Tomko et al., 2014), as well as outcomes of treatment (such as symptom decrease and increase in self-esteem; Harpoth et al., 2019). Compared to the more classical retrospective self-reports, in-situ evaluations using EMA has the advantage of reducing recall biases (Stone et al., 1994) and enables the modelling of the changes of real-life phenomena potentially explaining therapeutic change (Husen et al., 2016; Lutz et al., 2018).

In a recent study, Beuchat et al. (2021) examined validity, reliability and quality criteria of such an EMA module in a sample of University students both undergoing an emotion-focused one-session intervention focused on the elaboration of self-criticism *and* a theory-consistent EMA of emotional processing as the individual's response to interpersonal stress situations in daily life. The study used an individualized assessment procedure of emotions in daily life where the algorithm was programmed to respond to the individual's responses to gate questions, and then presented individual's profile-consistent items for specific emotion categories. Emotional processing as the individual's response to

the elaboration of the self-criticism (using a two-chair experiential task) were assessed in-session. While the reliability of the EMA-items was high, overall correspondence between emotional processing in daily life and in the experiential session was low. The study showed the relevance of differentiating between primary adaptive, primary maladaptive and secondary emotions (Greenberg & Paivio, 1997; Pascual-Leone, 2018) when it comes to understand links between in-session and daily live emotional processing. Primary maladaptive emotions are generally characterized as recurring negative feelings about the Self (i.e., in the form of problematic priors) or the relationship – possibly reminding a traumatic context which no longer exists, in immediate response to a situation. Beuchat et al. (2021) found that such primary maladaptive emotions self-assessed in daily life, in particular (maladaptive) fear and loneliness, were associated with in-session primary adaptive emotions in response to self-critical content. The researchers concluded that when confronting one's own self-criticism in-session, being able to access more productive emotions, may foster an emerging awareness in participants about the maladaptive emotional reactions they have in interpersonally difficult situations. A promising design feature of that study was the use of an experiential two-chair dialogue to elaborate contents and processes related to self-criticism (see also Nardone et al., 2021; Kramer et al., 2016). Evoking emotion in the context of such a semi-structured session may offer the opportunity to study the emotional building blocks – as potential components of the protoself according to Damasio – related to changes in self-esteem. This may be best done in the context of a single-session intervention, or analogue session, focusing on the resolution of self-criticism. Shahar et al. (2014) showed that such single session emotion-focused interventions contribute to medium-to-large changes in self-compassion and other self-esteem related

aspects, as well as in depressive and anxious symptoms. For our purpose on emotional processing in daily life, the original study by Beuchat et al. did not examine the *changes* in emotional processing and did not examine in-session predictors (i.e., self-esteem) of these changes. The present study is a secondary analysis from Beuchat et al. (2021) aiming to do exactly that.

The present study had two aims. Firstly, this study explored in-session fluctuation of state self-esteem (i.e., as marker of activated problematic priors) as predictors of changes in self-reported emotional processing that are observed in daily life. We hypothesized that the more intensely the individual experiences problems in self-esteem within the session, the more intense an individual will experience problematic emotions in daily life (in reaction to interpersonal stress; within-person comparison). Secondly, we explored the links between in-session self-esteem (i.e., as marker of activated priors) and symptom levels, as well as interpersonal problems. Specifically, we hypothesized that an individual with more self-esteem problems (i.e., markers of problematic priors activated in the session) would also have more symptoms (between-person comparison).

Methods

Participants

The present exploratory study used archival data (see Beuchat et al., 2021) and includes a total of 42 participants out of whom 35 (83%) self-identified as women (age between 20 to 33 years, M = 22.43, SD =2.86). Participants were university students in an undergraduate degree in psychology. The study was approved by the institutional ethics review board (number 2018-02064).

Assessments and measures

Self-report questionnaires. State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) is a self-reported assessment encompassing 20 items to assess momentary changes in self-esteem. A 5-point Likert scale is used. Validity of the scale, as well as its sensitivity to laboratory manipulations, and high internal consistency (Cronbach alpha = .92), was shown by Heatherton and Polivy (1991) for adults and by Linton and Marriott (1996) for adolescents (with consistent results). High scores on this measure mean "more problems in self-esteem", which we will translate here as "low-point self-esteem". In the present study, we used the overall mean score. The mean scores ranged between 3.35 and 3.85 for adults (Heatherton et al., 1991) and between 3.75 and 4.00 for adolescents (Linton et al., 1996).

The Outcome Questionnaire (OQ-45) is a self-report questionnaire which aims at assessing levels of distress by using 45 items (Lambert, 2004). The intensity of problems are rated on a Likert-type scale (between 0 = never and 4 most of the times). For the present study, the French version of the scale was used, and only the overall score was used. Cronbach alpha for the current sample was .89.

The Borderline Symptom List 23 (BSL-23) is a self-report questionnaire which aims at assessing the intensity of borderline symptoms using 23 items (Bohus et al., 2009). The intensity of problems is rated on a Likert-type scale (between 0 = absent and 4 = clearly present). For the present study, the French version of the scale was used (Nicastro et al., 2016) and the overall score was used. Given the rather high prevalence of borderline symptoms in young adult populations, and the clinical of these symptoms, we decided to include this questionnaire in this study. Cronbach alpha for the current sample was .87.

The Inventory of Interpersonal Problems (IIP) is a self-report questionnaire aiming at assessing the intensity of interpersonal problems (Horowitz et al., 1988). The scale

encompasses 64 items, using a Likert-type scale (between 0 = not at all and 4 = very much). For the present study, we used the French version of the scale and the overall score. Cronbach alpha for the current sample was .91.

Experiential assessment. In order to be able to observe the participant's fluctuation of self-esteem in-session, involving all activities bet, the participant was invited to undergo a 30 minute experiential task focusing on the elaboration of personal self-criticism (Beuchat et al., 2021; Nardone et al., 2021; Kramer et al., 2016; Shahar, 2014; Whelton & Greenberg, 2005). This was done one-on-one with each participant using an experiential two-chair dialogue from Gestalt-therapy and emotion-focused therapy (Greenberg, 2015). Focusing on the resolution of personal self-criticism, such a two-chair dialogue, may also be understood as a brief intervention (Shahar, 2014; Shahar et al., 2012).

The two-chair dialogue followed standard research procedures for experiential task (Kramer & Pascual-Leone, 2016; Whelton et al., 2005), and the SSES was given at three timepoints during that experiential task. In the present study, we understand the notion of "in-session" as involving any activity between the first and the third assessment using the SSES (i.e., contact with the clinical researcher). Before the task started, the SSES was given (i.e., baseline measure; assessment 1). Then (Step 1) a guided imagery task was introduced, in which the participant was invited to recall a situation of failure, and was encouraged to imagine the situation in great detail (for 5 minutes, attend to one's bodily sensations, action tendencies, intentions, feelings, emotions and thoughts; of note, the participant was not asked to share the content of their failure with the investigator). Before continuing, the SSES was given again (i.e., pre-chairwork measure; assessment 2). Step 2: The investigator then invited the participant to change chairs, by giving the instruction

(once seating on the opposing chair): "Imagine, on this chair, you are the self-critical part in yourself. Be that part now. What do you say to his other part?" (at this time, the participant expresses their self-critical voice). Step 3: The investigator then invited the participant to change chairs again, by giving the instruction (once seated on the original chair again) "What is it like to be on the receiving end of this? What happens inside when you hear this?" (Here, the participant elaborates on their experience). The dialogue (i.e., steps 2 and 3) was repeated a second time, and the investigator used empathic prompts aimed at process-guidance, although no content-guidance was provided by the investigator (see Kramer & Pascual-Leone, 2016). Finally, upon conclusion of the task, the SSES was given again (i.e., post-chairwork measure; assessment 3).

Ecological Momentary Assessment (EMA) of emotional processing. We then gave to the participants a phone for the EMA of emotional processing (in daily life) which prompted assessment four times a day, during seven consecutive days (programmed times were for each day 08h01am, 12h07pm, 04h10pm, 08h50pm; Beuchat et al., 2021). Emotional processing was anchored in the day-by-day occurrence of interpersonally stressful events and participants were asked about their inner emotional reaction to this event (the items reads: "Since the last assessment, have you had a difficult interpersonal experience or an interpersonal stress?", then the assessment module asks about the participant's "inner emotional reaction" to this event). The assessment is in keeping with the emotional states conceptualized by the sequential model of emotional processing (Pascual-Leone, 2009). Based on the participant's answers to specific gate questions (about the overall "type" of inner emotional reaction), the algorithm personalized the assessment and only proposed the relevant categories from the list below. This personalized selection

of items was based on emotion predominance (gate A with a forced choice of 1: which of the following state was predominant: sadness, anger, shame/guilt, fear/anxiety, hope or satisfaction) and was based on emotion intensity (gate B with a series of visual analogue scales on the intensity of each of the following general descriptors as a result of the interpersonal stress: sadness, anger, shame, anxiety). Then, each participant received the specific items from the list below, only if one named state was predominant (gate A) or if one named emotional state's intensity was over 40% on the visual analogue scale (gate B; see Beuchat et al., 2021).

The emotional states assessed by the specific items were differentiated according to the emotion theory underlying the sequential model of emotional processing (Pascual-Leone, 2009). They were secondary emotions (global distress, 7 items; e.g., "I feel vague intense pain"; rejecting anger, 8 items; e.g., I hate this person"; anxiety, 4 items; e.g., "I cannot stop worrying"), primary maladaptive emotions (loneliness, 6 items; e.g., "I feel lonely"; fear/shame, 6 items; e.g. for shame, "I could hide") and primary adaptive emotions (assertive anger, 6 items, e.g., "I want to fight for something"; hurt/grief, 6 items; e.g., "I feel wounded by this person"; self-compassion, 6 items; e.g., "I deserve to treat myself gently"). Each item is assessed on a present-absent (1-0) basis. Initial convergent and divergent validation coefficients were satisfactory (Beuchat et al., 2021).

Procedure

Inclusion criteria were good health, French-speaking (in a French-speaking environment), between 18 and 35 years old). After acceptance to be included in the study, the participants took part in the experiential assessment, then received the phone (Samsung

Galaxy J3) for EMA data collection. The participants also filled in the questionnaires. A compensation of $50 USD was given for participation in the study.

Statistical analyses

We conducted a series of preliminary analyses of the longitudinal EMA data (check of experimentation fatigue, detection of outliers), as well as performed Paired-Sample t-tests to demonstrate manipulation checks of change in state self-esteem in the experiential task. In order to test the first hypothesis, we ran a two-level Hierarchical Linear Model (HLM; Bryk & Raudenbush, 1987) where time-points were nested within participants. In order to test the second hypotheses, we computed Pearson's correlations. Statistical analyses were computed in SPSS Version 27 and HLM7.

Results

For the EMA data, the number of responses was distributed in a random fashion over the one-week time-period, which suggested that there was limited or no experimentation fatigue. Outlier analyses yielded consistent parameters and no individual had extreme scores. Interpersonal events were coded by the participants as taking place with intimate partners, family members, colleagues, strangers, friends, acquaintances and neighbors. Because the gate question related to the interpersonal event selected participants who did not have such an event, $n = 12$ participants had to be excluded because of absence on this item (and the following assessment schedule), yielding a $N = 30$ (Beuchat et al., 2021). Means (and SDs, and reliability coefficients Cronbach alphas) for the nine sub-scales were as followed: for global distress (M = 3.69, SD = 1.45, alpha = .90), for rejecting anger (M = 3.00, SD = 0.99, alpha = .70), for anxiety (M = 4.51; SD = 1.64., alpha = .00), for loneliness (M = 2.67, SD = 1.54, alpha = .91), for shame (M = 2.88, SD = 0.98, alpha =

.69), for fear (M = 1.98, SD = 1.14, alpha = .83), for hurt/grief (M = 4.38, SD = 1.54, alpha = .90), for assertive anger (M = 3.89, SD = 1.17, alpha = .41) and for self-compassion (M = 3.88, SD = 1.22, alpha = .63). Of note, these coefficients are based on the assumptions of a cross-sectional design, while the present study adopts longitudinal (within-participant) approach (see the discussion by Beuchat et al., 2021), so these coefficients may only partially be relevant.

The average score of assessment 1 of SSES was 2.43 (SD = 0.45; range between 1.55 and 3.20); the average score of assessment 2 of SSES was 3.15 (SD = 0.66; range between 1.80 and 4.15); the average score of assessment 3 of SSES was 2.73 (SD = 0.54; range between 1.90 and 3.75). These average score are consistent with the means observed in earlier studies (Heatherton et al., 1991; Linton et la., 1996), although slightly lower (which means our sample presents with slightly better self-esteem than the norm at assessment 1 and 3, while our sample is in the norm at assessment 2). We used Paired Sample *t*-tests to check whether the "low-point" SSES (corresponding to lowest in-session self-esteem) was found right after the imagination task (and right before the actual two-chair dialogue; assessment 2). The results confirmed this assumption (comparison between assessments 1 and 2 (i.e., between baseline and pre-chairwork), the SSES score increased with $t = -6.64$, $p = .00$; comparison between assessments 2 and 3 (i.e., between pre- and post-chairwork), the SSES score decreased with $t = 3.14$, $p = .00$). As such, for further computation, we identified as the low-point in self-esteem (SSES score at assessment 2 (i.e., pre-chairwork)) and within-person change in self-esteem (increase of SSES score between assessments 1 and 2 (i.e., baseline and pre-chairwork), which we will refer to as the "decrease in self-esteem" below) as one of the variables of interest. Of note, "decrease

in self-esteem" translates to increase in the scores on the SSES measure, and "low-point in self-esteem" translates to high scores on the SSES measure. Given this pattern of results, it makes sense to describe the SSES at assessment 1 and 3 as more trait-based, while at assessment 2 (along with the changes between 1 and 2 and between 2 and 3) as state-informed. Assessment 1 becomes the level of SSES at pre-task (i.e., default level of self-esteem), and assessment 3 the default level of self-esteem the individual "falls back on" (at least partially) at the very end of the two-chair task, in the present study on a significantly higher level than at assessment 1 (t = -4.13, p = .00; Paired-Sample t-test comparing SSES scores between assessment 1 and 3).

The first hypothesis aimed at predicting changes in categories of emotional processing in daily life by in-session self-esteem, low-point self-esteem, decrease in self-esteem between assessments 1 and 2 and increase in self-esteem between assessment 2 and 3. Tables 1, 2 and 3 show the results for three separate models run (only main predictor effects shown for fixed effects). It appeared that the week-long changes in more global and reactive secondary emotions (global distress, rejecting anger and anxiety) were not predicted by the in-session low-point nor changes in self-esteem. Similarly, it appeared that the week-long change in the most productive primary adaptive emotions (i.e., assertive anger, hurt/grief and self-compassion) were not linked with the in-session low-point nor changes in self-esteem. However, there were specific predictive links between self-esteem and the change in the primary maladaptive emotions. Firstly, we found that the deeper the in-session self-esteem was while working on the self-criticism, the more lonely (across the week) the individual self-reported feeling in interpersonal stress situations (Table 1, increase in loneliness). Secondly, we found that the greater the difference between baseline

and pre-chairwork assessments (i.e., assessments 1 and 2) in the experiential session, the less and less fearful and shameful (across the week) the participant self-reported feeling in interpersonal stress situations (Table 2, decrease in fear and shame). Thirdly, we found that the greater the difference between pre- and post-chairwork assessments (i.e., assessments 2 and 3) in the experiential session, the less and less shameful (across the week) the participant self-reported feeling in interpersonal stress situations (Table 3, decrease in shame). Reliability estimate of the HLM models varied between .42 and .99 which was deemed acceptable; the average reliability for the maladaptive emotions were .51 (fear), .55 (loneliness) and .91(shame), which was, again, acceptable.

The second hypothesis aimed at testing the links between in-session self-esteem (both low-point and changes) and levels of symptoms assessed in the end of the procedure. Table 4 reports the results from the Pearson's correlation analyses. We found a systematic pattern of significant correlations between state self-esteem assessed before the experiential task (baseline; assessment 1; with general problems $r = .74$, $p = .00+$; with borderline symptoms $r = .60$, $p = .00+$; with interpersonal problems $r = .66$, $p = .00+$) and after the experiential task (post-chairwork; assessment 3; with general problems $r = .53$, $p = .00+$; with borderline symptoms $r = .55$, $p = .00+$; with interpersonal problems $r = .45$, $p = .01$) with symptom levels. In contrast, no significant correlation was found between state self-esteem assessed right after the imagination task, nor right before the two-chair dialogue (pre-chairwork; assessment 2; where low-point self-esteem was found; with general problems $r = .20$, $p = .30$; with borderline symptoms $r = .17$, $p = .36$; with interpersonal problems $r = .27$, $p = .15$) with symptom levels. Also, no significant correlation was found between the changes in state self-esteem (i.e., difference score between baseline and pre-

chairwork; assessments 1 and 2; with general problems r = .-.30, p = .11; with borderline symptoms r = -.23, p = .32; with interpersonal problems r = -.17, p = .36 ; as well as difference score between pre- and post-chairwork; assessments 2 and 3; with general problems r = .22, p = .25 ; with borderline symptoms r = .25, p = .19 ; with interpersonal problems r = .09, p = .63) with symptom levels.

Discussion

The present study aimed to explore the links between in-session state self-esteem (assessed in an experiential two-chair dialogue) with changes in emotional processing evaluated using a week-long ecological momentary assessment. The study also wanted to explore the links between in-session state self-esteem and symptom load in a University student sample. The study showed specific links between changes in primary maladaptive emotions with in-session self-esteem, which is consistent with, and extends, the results from the cross-sectional analysis by Beuchat et al. (2021) on the same sample. We also showed that in-session *state* self-esteem indexes were not associated with symptom intensity, but in-session *trait* components of self-esteem were.

Consistent with our hypotheses, in-session self-esteem predicted the changes in primary maladaptive emotions self-assessed in the daily life. Interestingly, no other changes in emotional categories were related with the in-session processes (Beuchat et al., 2021). Most interestingly, the relationship went into opposite directions for different categories of primary maladaptive emotions assessed in daily life (see the details below).

Low self-esteem after the imagination task was associated with an *increase* in loneliness in the interpersonal situations over the week post-experiential session. There are a number of explanations for this observation. Firstly, the experiential session may have

had an increasing impact on the participants' awareness of their sense of loneliness associated with the interpersonal stress. The observation that this sense of loneliness increases over one week of EMA is interesting and speaks to a medium-term effect of the experiential assessment on the individual's emotional integration in daily life. Secondly, the imagination task may speculatively elicit a negative core self, according to Damasio (2010), and it may activate a number of associated emotional processes, in particular those pertaining to the core self and the protoself. The latter may represent building blocks of changes in self-esteem, as observed in our study. Feelings of (primary maladaptive) loneliness may be part of these and may support a recurrent self-organization, or schematic emotional memory of past experiences, that are triggered by current interpersonal situations (Smith et al., 2020; Greenberg, 2019). It is interesting that this effect was specific to loneliness, and was not observed for shame nor fear. We can speculate that the context of the interpersonal stress may have co-determined the type of emotion the participants were more and more aware of in daily life. Findings from a questionnaire study (using the SSES) demonstrated predictive validity of state self-esteem specifically for low scores of self-reported loneliness (Bozorgpour et al., 2012) which may speak in favour of a specific link with loneliness. The unique contribution of our study is that it extends the research on state self-esteem to links between in-session and out-of-session processes (e.g., loneliness) und it underlines how it important it is to attend to fluctuations in processes related with the Self (Webster et al., 2020).

The in-session decrease in self-esteem predicted the *decrease* over the week of self-reported fear and shame in interpersonal situations. This result is in line with the overall observation, gained by meta-analytic research from questionnaire research, that shame and

self-esteem have close links and co-determine each other's intensity (Budiarto et al., 2021). However, the latter meta-analysis found a negative effect size of the link between the two constructs (r = -.64), whereas in our study, we found a positive association (see Table 2; the more the in-session self-esteem decreases with regard to the individual's baseline, the more shame decreases over the following week). The experiential task used in our study may explain this divergence. We believe that the decrease in self-esteem may be an index of the participant's engagement with the experiential task of activating a failure memory, and the participant's general responsiveness to the experiential session.

The differential links between in-session self-esteem and symptom levels may speak to the explanation above. While the more stable trait-components of self-esteem (evaluated during the task at assessments 1 and 3, at baseline and in the end) both relate to symptoms assessed a week later, the state-bound self-esteem indexes were not related with the level of symptoms. The latter result may, again, illustrate the effect of participant's engagement and responsiveness at a critical moment of the in-session task: when the imagination of a failure takes place and when the experiential two-chair dialogue starts. Given this reflection and state of the results related with symptoms, the drop in self-esteem at that very moment could have been mediated by the participant's engagement, and possibly their emotional arousal, and thus represents an initial step of participant's being in contact with their core self and moving towards changing emotional processing with new emotional experiences, possibly propelling symptom change (Damasio, 2010; Smith et al., 2020). We may speculate that this very moment, right after the imagination task – when self-esteem is lowest in the task –, may represent a window into the proximal zone of emotional change. As such, the decrease in primary maladaptive shame and fear over the following week may

actually represent a possible out-of-session mechanism of change of experiential elaboration of self-criticism, explaining outcomes found in such very brief interventions focused on emotion (Kramer et al., 2016; Shahar et al., 2012). Whether the day-by-day decrease in primary maladaptive fear and shame is so central for explaining change in symptoms should be investigated in larger controlled studies on the mechanisms of brief emotion-focused interventions. Whelton and Greenberg (2005)'s results suggest that there may be a connection between low self-esteem, as evidenced during an experiential two-chair dialogue, and the participant's vulnerability to dysthymia and depression. In emotion-focused therapy, it is assumed that the in-session activating and accessing the full range of experiences, including components of the sense of Self, self-esteem, and emotions associated with these processes, are key for developing one's growth potential and for emotion transformation (Haberman et al., 2019; Pascual-Leone, 2009; Greenberg, 2019).

In order to be able to measure emotional processing as mechanism explaining change in the actual real life of the study participants, we recommend the present theory-consistent EMA module be used. This recommendation is in line with the model of explanatory mechanisms of change in psychotherapy outlined by Doss (2004) which differentiates between therapist interventions (i.e., in our study the experiential task of self-criticism), client's in-session processes (i.e., in our study the changes in self-esteem) and client's out-of-session mechanisms of change (i.e., in our study the changes in primary maladaptive emotional processing) of a treatment explaining the outcome of the treatment. The present research was able to differentiate between in-session state self-esteem and out-of-session emotional processing, and explore their relationships from an empirically sound approach.

The present study presents with a number of limitations. The present study focuses on mostly female undergraduate University students, so caution must be applied when attempting to generalize the findings to other populations, including clinical. The overall N is small, but we adapted our statistical analyses by drawing on the longitudinal design of the study. Nevertheless, the results have an exploratory character, in particular because certain EMA items have a low base rate, so the present study should be replicated in a variety of samples, including samples with patients undergoing treatment. Scores in state self-esteem were slightly better than in other samples using the same scale, although only at assessments 1 and 3 in our design. This speaks to the need of studying these processes in severely impaired samples. As additional limitation and related with the limited power, we did not analyse the sub-scales of the SSES which have shown promising results (Webster et al., 2020). We only assessed symptoms in the very end (and omitted to do so in the beginning): this is because we planned the study as an exploratory validation of the EMA item qualities, and were less interested in the impact on unknown symptoms healthy controls may have of the experiential session. Also, a second experiential session after the week-long EMA, with relevant assessments would help to understand more of such very brief emotion-focused interventions on a) daily-life emotional processing and b) symptom levels. Finally, conceptually, there is a difference between the presence of a self-reported emotion, and its processing and integration in experience: with the present study, we assessed the presence of emotion, but did not assess the level or quality of the processing itself.

Despite these limitations, the present study is one of the first which systematically assesses the links between in-session self-esteem and the changes in emotional processing

in daily life. As such, we speculate that the therapist intervention (i.e., the chairwork focusing on the resolution of self-criticism) contributed to activate in-session affective components of the protoself, which form an emerging experience as a negative core self (i.e., with markers of low self-esteem, including the self-critical prior content "I am a failure"), which predicts changes in primary maladaptive emotions in daily life the following week. The impact of low in-session state self-esteem on primary maladaptive emotions experienced in interpersonal situations (but not on any other types of emotion) is interesting and worth exploring in further research. Also, for state self-esteem measured at a crucial moment of the work on the self-criticism (when such indexes are expected to be the lowest, right after the activation of the memory of the failure), this study found no links with symptom change (while such links were found for more stable trait components of self-esteem). It may be hypothesized that the general strong relationship between self-esteem and symptom intensity may be washed out by the experiential session, and possibly by the potential the participant's emotional engagement plays for further differentiating and processing of emotional experiences. Such research may help gain more insight into the emotional underpinnings of self-esteem and its links with outcome in psychotherapy and counselling contexts.

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Table 1

Changes in self-reported emotions in daily life predicted by low-point in-session self-esteem

Variable	coefficient	SE	*T*-ratio	*p*
Secondary				
Global distress	0.29	0.55	0.53	.61
Rejecting anger	0.27	0.65	0.43	.67
Anxiety	0.03	0.47	0.06	.95
Primary maladaptive				
Loneliness	2.09	0.85	2.46	.02
Fear	0.93	1.05	0.89	.39
Shame	-1.07	1.69	-0.64	.54
Primary adaptive				
Assertive anger	0.13	0.59	0.22	.83
Hurt/Grief	-0.09	0.12	-0.77	.45
Self-compassion	-0.10	0.10	-1.04	.31

Note. Loneliness increases over the week-long assessment. Tests using two-level Hierarchical Linear Modelling.

Table 2

Changes in self-reported emotion in daily life predicted by change in in-session self-esteem between assessment 1 and 2

Variable	coefficient	SE	*T*-ratio	*p*
Secondary				
Global distress	-0.57	0.54	-1.06	.31
Rejecting anger	-0.39	0.33	-1.20	.24
Anxiety	-0.38	0.45	-0.85	.41
Primary maladaptive				
Loneliness	-0.34	0.33	-1.02	.32
Fear	-0.68	0.28	-2.41	.03
Shame	-0.49	0.01	-4.90	.00
Primary adaptive				
Assertive anger	-0.12	0.25	-0.49	.63
Hurt/Grief	-0.70	0.53	-1.33	.21
Self-compassion	-0.16	0.25	-0.62	.54

Note. Fear and shame decrease over the week-long assessment. Tests using two-level Hierarchical Linear Modelling.

Table 3

Changes in self-reported emotion in daily life predicted by change in in-session self-esteem between assessment 2 and 3

Variable	coefficient	SE	*T*-ratio	*p*
Secondary				
Global distress	-0.16	0.51	-0.32	.75
Rejecting anger	-0.24	0.36	-0.68	.51
Anxiety	-0.14	0.37	-0.39	.70
Primary maladaptive				
Loneliness	0.25	0.26	0.98	.34
Fear	0.34	0.23	1.46	.17
Shame	0.48	0.00	141.20	.00
Primary adaptive				
Assertive anger	0.01	0.30	0.04	.97
Hurt/Grief	-0.28	0.53	-0.54	.60
Self-compassion	-0.19	0.24	-0.79	.44

Note. Shame decreases over the week-long assessment. Tests using two-level Hierarchical Linear Modelling.

Table 4

Pearson's correlations between in-session self-esteem and symptom levels

	SSES 1	SSES 2	SSES 3	Δ SSES 1-2	Δ SSES 2-3
General problems	.74**	.20	.53**	-.30	.22
Borderline symptoms	.60**	.17	.55**	-.23	.25
Interpersonal problems	.66**	.27	.45**	-.17	.09

Note. ** $p < .01$. SSES: State Self-Esteem Scale. 1, 2 and 3 refer to the three assessment points within the experiential task.