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# Emotion-focused ego-state coaching reduces communication apprehension: evidence from a randomized controlled study

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**Background:** Communication apprehension (CA) is a widespread phenomenon negatively affecting communicative skills, psychological well-being, and social connectedness. This randomized controlled study investigated whether online emotion-focused ego-state coaching, based on the emTrace framework, can sustainably reduce CA.

**Methods:** A total of 260 German-speaking participants with elevated CA were randomly assigned to one of two ego-state coaching interventions: Core Transformation (CT) or Smart Part Lab (SPL). CA was assessed using the PRCA-24 and a bipolar scale of subjective feeling at pretest, posttest, and 2-week follow-up.

**Results:** Both interventions significantly reduced CA [ $F_{(2, 258.3)} = 242.14$ ,  $p < 0.001$ ; pre:  $M = 80.7$ ; post:  $M = 63.4$ ; follow-up:  $M = 62.3$ ;  $\eta^2_p = 0.65$ ), with 80% of initially high-CA participants reporting moderate or low CA at follow-up. CT induced stronger self-transcendent experiences than SPL; however, this did not translate into a stronger CA reduction, suggesting self-transcendence is not the primary mechanism of change.

**Conclusion:** A single 80-min online ego-state coaching session within the emTrace framework sustainably reduced trait-like CA. The findings highlight the potential of resource-oriented, emotion-focused coaching as a low-threshold intervention to foster communicative confidence and psychological resilience.

## KEYWORDS

ego-state coaching, emTrace, communication apprehension, online coaching, self-transcendence, emotion coaching, emotion-focused intervention

## 1 Introduction

Communication apprehension (CA) is defined by McCroskey (1977) as “an individual’s level of fear or anxiety associated with either real or anticipated communication with another person or persons”. Research demonstrated that it is a widespread phenomenon: In a large-scale study (Marcel, 2019) of over 3,000 working adults, around 20% of respondents reported high levels of CA, with a further 35–40% exhibiting moderate degrees. This distribution remained stable regardless of educational level. The high prevalence of CA was confirmed in further studies (de Araújo et al., 2022; Croucher et al., 2023; Schulenberg et al., 2023).

Young adults seem to be particularly affected (Marcel, 2019): the mean CA was highest in the 20–29 age group, indicating that it is most pronounced at the beginning of a career. With increasing age, growing professional experience, and especially with increasing presentation frequency, CA decreases significantly—an effect that was consistently observed across all age groups. Nevertheless, Marcel (2019) also showed that although CA decreases over the course of a lifetime, it does not automatically disappear completely. Rather, the decline seems to be a slow, experience-based process that often remains incomplete without targeted intervention, such as coaching.

CA not only impairs communication skills but is also closely correlated with psychological and physical wellbeing. People with high CA often avoid situations that require a high level of speaking or take on more passive roles in conversations, which can result in impaired development of communication skills in the long term (Marcel, 2019). Furthermore, CA has been shown to correlate negatively with psychological wellbeing: Students with high CA reported significantly higher stress levels and lower psychological wellbeing (Agrawal and Krishna, 2021). Of particular concern is that CA can promote social withdrawal, thereby hindering the development of stable, supportive relationships. This is significant insofar as social connectedness is a key predictor of physical health and longevity: A comprehensive meta-analysis involving over 300,000 participants showed that insufficient social relationships increase the risk of mortality more than other established risk factors such as obesity, high blood pressure, or smoking (Holt-Lunstad et al., 2010).

Against this background, it seems relevant from a social and health policy perspective to identify effective ways to reduce communication apprehension. Low-threshold, resource-oriented formats such as coaching offer particular potential here, as they can also be used outside clinical contexts and can be employed both preventively and as an accompanying intervention. Because numerous studies have shown that fostering emotion regulation is transdiagnostically effective and can, for example, specifically reduce symptoms of anxiety (Sakiris and Berle, 2019; Carlucci et al., 2021; Saccaro et al., 2024), coaching methods that actively incorporate emotion regulation into the change process could be a promising approach to reducing CA. Such a coaching approach is emTrace.

emTrace is an emotion-focused coaching framework. In contrast to more cognitive oriented coaching methods (e.g., GROW Coaching Model), which demonstrated its effectiveness in behavioral change (Panchal and Riddell, 2020), emTrace focuses on the central importance of emotions for change processes (for the significance of emotions in therapeutic changes, see e.g., McNeil and Repetti, 2022) and implements common factors (following Grawe, 2004) in coaching (such as the coach-client working alliance). To maximize the accuracy of fit between intervention and client's personality and needs, emTrace integrates emotion regulation techniques in different kinds of interventions (e.g., ego-state coaching) (see Eilert, 2021). Emotion regulation is achieved during emTrace coaching through bifocal processing (see e.g., de Voogd et al., 2018; Wittfoth et al., 2020), i.e., the clients split their attention between two stimuli, e.g., they focus their gaze on a specific point in space and simultaneously observe,

without evaluating what is happening internally, which mental images, thoughts, and feelings emerge (Corrigan and Grand, 2013). Other tasks that promote emotion regulation via bifocal processing can include counting backward (e.g., van den Hout et al., 2010; Engelhard et al., 2011), tapping (e.g., Nelms and Castel, 2016), or slow-paced breathing (e.g., Wells et al., 2012; You et al., 2021). A pilot study (Nachreiner, 2020) demonstrated that emTrace coaching can reduce test anxiety.

While emTrace emphasizes the role of emotions in facilitating change, it is also important to consider the specific characteristics of CA as a phenomenon. The more accurately an intervention fits the underlying structure and experiential nature of a problem, the more effective it tends to be (Cuijpers et al., 2019; Nye et al., 2023). This raises the question of how CA can be conceptualized in a way that informs the choice of a well-fitting coaching intervention.

McCroskey (1977) understands CA less as a form of state anxiety and more as a manifestation of trait anxiety, defined as a consistent tendency to respond with fear or avoidance across a variety of communication contexts. Unlike state anxiety, which is elicited by specific situations, trait-based CA reflects a stable internalized pattern of emotional responses. This conceptualization suggests that individuals who experience high levels of CA may not simply be reacting to external triggers, but rather expressing a recurring, identity-related internal state. From this perspective, CA may be associated with what ego-state theory (Watkins and Watkins, 1979, 2019) refers to as an “inner part” or “ego state” that embodies earlier experiences and coping strategies related to social evaluation, rejection, or performance pressure.

Several studies have already demonstrated the effectiveness of ego-state interventions for various problem areas, particularly in the therapeutic field; for example, in the treatment of attachment trauma (e.g., Phillips, 2013; Spiegel, 2016), for post-traumatic stress disorder (e.g., Barabasz, 2013; Barabasz et al., 2013), narcissistic personality disorder (e.g., McNeal, 2007), specific phobias (e.g., Daharnis et al., 2021), and in depression therapy (e.g., Alladin, 2013).

This study examines the effect of two prominent ego-state interventions in the coaching literature on reducing CA: first, *Core Transformation* (CT), based on Andreas and Andreas (2008), and second, *Smart Part Lab* (SPL), based on the 6-Step-Reframing by Bandler and Grinder (1982); both modified for emTrace by integrating emotion regulation techniques according to Eilert (2023).

Braganza et al. (2019) demonstrated that CT promotes emotional stability, emotional balance (ratio of pleasant emotions to unpleasant ones), and general wellbeing. In addition, the effectiveness of CT was demonstrated in another pilot study by Braganza and Piedmont (2015). In contrast, despite extensive database searches, no research could be found on the ego-state intervention of 6-Step-Reframing according to Bandler and Grinder (1982).

Derived from the research just described, the first hypothesis is as follows:

*H1: Communication apprehension differs in degree before and after the emTrace ego-state intervention; specifically, the coaching intervention reduces it.*

The present study aims beyond investigating the mere effectiveness of ego-state coaching and asks what the possible mechanism of change by an ego-state intervention might be. Regarding CT, *self-transcendence* could be an essential factor.

According to [Andreas and Andreas \(2008\)](#), CT aims to achieve a self-transcendent state, a so-called core state; research speaks of the “smaller self-effect”. Zen Buddhism summarizes its transformative effect with the axiom “no self, no problem” ([Niebauer, 2019](#)). Brain research demonstrated that the smaller self-effect is even shown at a neuronal level: when a person feels self-transcendent emotions, the neuronal self-networks that are central to the person’s sense of self are inhibited in their activity ([Urgesi et al., 2010](#); [van Elk et al., 2019](#)). Consequently, core states decrease the tendency to ruminate about problems (e.g., [Tarani, 2017](#)). In addition, activating self-transcendent emotions, such as awe, promotes a resilient reaction to stress and buffers the negative effects of feedback ([Atamba, 2019](#)). Furthermore, [Le et al. \(2019\)](#) showed that experimental-induced awe fostered that the subjects perceived challenges ahead of them as more minor. Activating self-transcendent states also promotes the ability to think creatively and openness to new experiences ([Chirico et al., 2018](#); [Stancato and Keltner, 2019](#)). This indicates that the activation of self-transcendent emotions could help reduce CA.

Therefore, based on these research results, the second hypothesis is:

*H2: By activating a self-transcendent state, Core Transformation will reduce communication apprehension to a greater extent than an ego-state intervention that does not produce such a state.*

This second main hypothesis can be divided into two sub-hypotheses:

*H2a: Core Transformation results in an increased activation of a self-transcendent state compared to a conventional ego-state coaching intervention (here: Smart Part Lab).*

*H2b: The greater the self-transcendent state experienced by the person during the intervention, the greater the positive effect on the reduction of communication apprehension.*

Finally, the question arises as to what extent the client’s personality influences the extent to which an ego-state intervention can activate a self-transcendent state. The third main hypothesis relates to the client’s personality. The trait of openness to experience—one of the five personality factors proposed by [McCrae and Costa \(1992\)](#)—seems to be of particular interest as a moderating factor. The degree of openness to experience is correlated with the frequency of experiencing self-transcendent emotional states (e.g., awe, love, compassion) (e.g., [Shiota et al., 2006](#)). This study, therefore, focuses on the moderating influence of the degree of the personality trait openness to experience in the client on the degree of activation of a self-transcendent state through an ego-state intervention.

The third hypothesis is (moderator hypothesis):

*H3: The influence of the ego-state intervention on the activation of a self-transcendent state depends on the client’s openness to experience.*

**Figure 1** presents the three hypotheses in a graphical overview.

## 2 Materials and methods

### 2.1 Sample description and acquisition

This study focuses on female and male people in German-speaking countries who suffer from CA and are willing to consult a coach to reduce it. The sample was recruited via a call on social media and on the homepage of the Eilert Academy website. The incentive to participate was receiving free coaching to reduce CA. There were no other incentives.

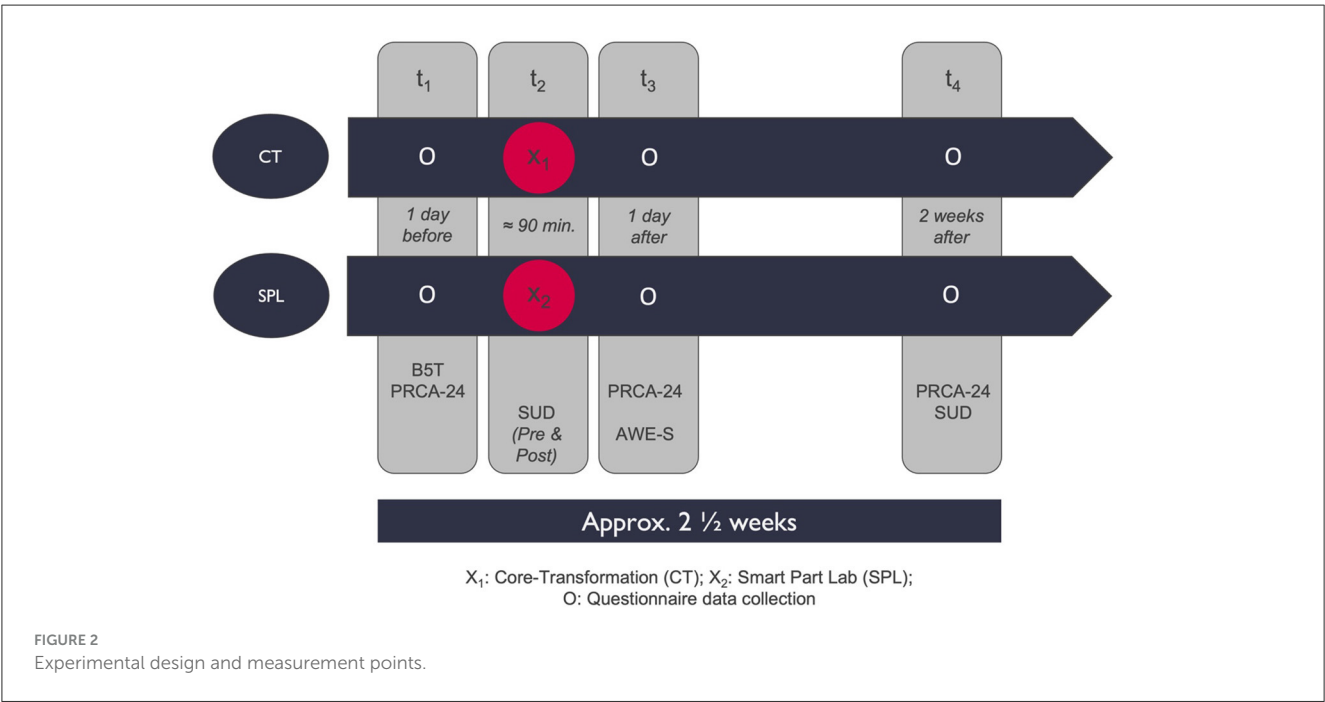
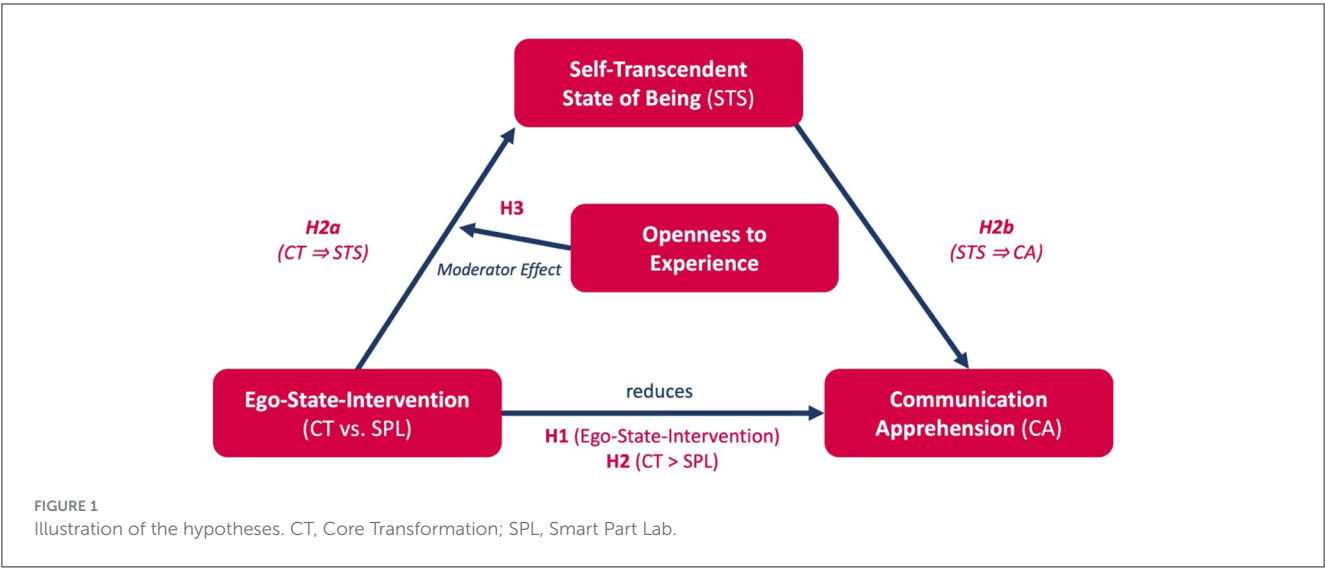
The subjects were registered centrally using a form and then randomly allocated to the experimental and control groups under the restriction of equal group sizes. The subsequent allocation of clients to the 67 emTrace coaches who conducted the interventions was also randomized. Care was taken to ensure each coach had approximately the same number of clients per intervention group (see [Table A-1](#); SPL per coach:  $M = 1.9$ ,  $SD = 0.7$ ; CT per coach:  $M = 2.0$ ,  $SD = 0.9$ ). The gender distribution of coaches was slightly skewed in favor of women at 64.2 %. The high number of coaches and the randomized but equal division of clients into CT and SPL groups per coach aimed to control for confounding variables related to the coach (e.g., competence, performance motivation, or personality traits). The clients’ gender, age, and level of education were measured as personal variables. They were also asked whether German was their mother tongue. As the overall proportion of male subjects was significantly lower than that of female participants (22.7 % vs. 77.3 %), the gender distribution between the CT and SPL groups was parallelized.

A total of 265 subjects were recruited for the study, although five of these had to be excluded due to suspected alexithymia, which was within expectations; according to [Montreuil and Pedinielli \(1995\)](#), around one in ten people show difficulties perceiving their feelings and describing them in words. These clients reported considerable difficulties in describing their feelings, making it impossible to realize the interventions. This would have exceeded the planned 90-min time frame. 260 subjects were in the final sample, 133 in the CT intervention group and 127 in the SPL intervention group.

The age of the participants was between 19 and 69 years. The CT group ( $M = 39.1$  years,  $SD = 11.3$  years) did not differ significantly in age from the SPL group ( $M = 40.1$  years,  $SD = 11.7$  years),  $t_{(258)} = 0.65$ ,  $p = 0.52$ . No significant differences were shown in the gender composition (CT: 78.2 % female; SPL: 76.4 % female),  $\chi^2_{(1)} = 0.12$ ,  $p = 0.73$ , or in whether German was the native language (CT: 94.0 %; SPL: 92.1 %),  $\chi^2_{(1)} = 0.35$ ,  $p = 0.56$ . There was also no significant difference between the CT and SPL group regarding the highest educational qualification,  $\chi^2_{(6)} = 3.53$ ,  $p = 0.74$ . The most common highest educational qualification was a degree of a university of applied sciences or A-levels (CT: 31.6 %; SPL: 30.7 %) and the least common was a secondary school leaving certificate.

### 2.2 Study design and procedure

The experiment was conducted as a randomized controlled pre-post study with a 2-week follow-up period (see [Figure 2](#)).



Participants were randomly assigned to one of two treatment conditions: Core Transformation (CT) or Smart Part Lab (SPL).

Two dependent variables were measured. CA was measured online using the PRCA-24 at three measurement points (a pretest measurement  $t_1$ , 1 day before the coaching, a posttest measurement  $t_3$ , 1 day after the intervention, and a follow-up measurement  $t_4$ , 2 weeks after completion of the treatment). The SUD values were also measured directly before and after the coaching ( $t_{2a,b}$ ) and in the follow-up ( $t_4$ ). The state of self-transcendence (STS) in relation to the effect of the specific ego-state intervention was measured 1 day after the coaching ( $t_3$ ). In addition, the personality trait openness to experiences was measured as a moderator variable with the B5T 1 day before the coaching ( $t_1$ ). All coaching sessions were conducted online using the video conferencing provider Zoom, following the seven process steps subsequently outlined.

### 2.2.1 Measuring communication apprehension (CA)

According to McCroskey (1978), communication apprehension was measured using the *Personal Report of Communication Apprehension* (PRCA-24). This test was only available in English. It was translated into German and back-translated by a native English speaker to check the translation's quality and optimize it (see Appendix B). An example item is "I am tense and nervous while participating in group discussions". The PRCA-24 asks about the degree of communication apprehension using 24 items on a 5-point Likert scale (strongly disagree – disagree – undecided – agree – strongly agree) for four contexts: group discussions, meetings, dyadic conversations, and public speaking. A total score is calculated for the PRCA-24.



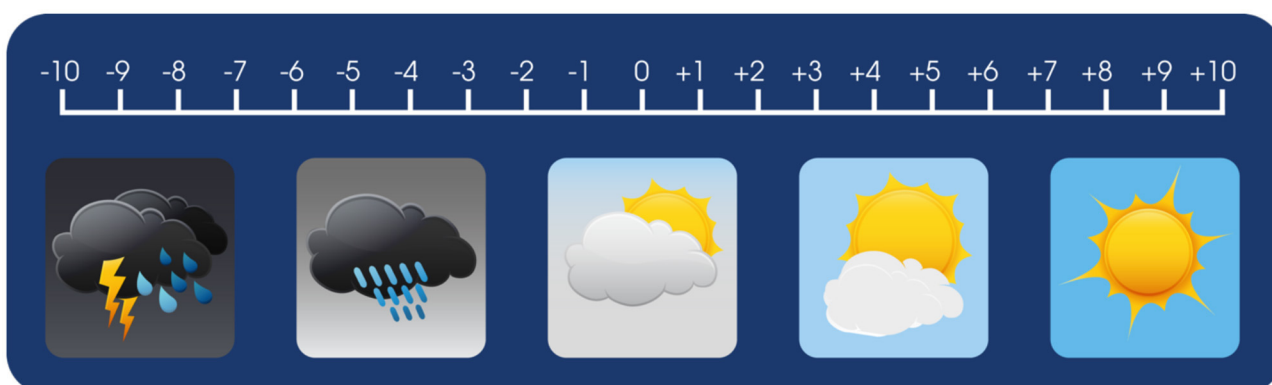


FIGURE 3  
Bipolar scale of subjective feeling.

The psychometric quality of the English-language PRCA-24 is considered high (see Woods, 2007): Cronbach's alpha is between 0.93 and 0.95. The retest reliability is 0.80, showing that CA measured by the PRCA-24 is stable over time. As part of a preliminary study ( $n = 202$ ), the first author has checked the internal consistency of the German version of the PRCA-24, which was developed specifically for the present study. Cronbach's alpha was 0.96 and can be rated as excellent. Construct and criterion validity of the PRCA-24 are also supported by research (see also Woods, 2007).

In addition to the PRCA-24, CA was measured on a visual bipolar scale of subjective feelings (see Figure 3). When thinking about a specific stressful communication situation (individually chosen by each client), the clients assessed the intensity of their communication apprehension immediately before and after the intervention ( $t_{2a,b}$ ) and 2 weeks later ( $t_4$ ) on a *bipolar scale of subjective feeling*, ranging from  $-10$ , which represents the subjectively most unpleasant feeling, to  $+10$ , which symbolizes the subjectively most pleasant feeling;  $0$  represents a neutral emotional state.

Because the Subjective Units of Distress (SUD) scale ( $-10$  to  $0$ ) measures state anxiety rather than trait anxiety, this measurement complements the PRCA-24 to additionally assess the change in subjective feeling regarding the specific communication situation, which was chosen by the client as a starting point of the ego-state intervention. Kim et al. (2008) demonstrated the validity of such a one-item scale and showed that the SUD score at the end of the first session could predict the overall therapy outcome.

## 2.2.2 Measurement of openness to experience

The moderator variable openness to experience was measured using the B5T according to Satow (2012b). Cronbach's alpha is between 0.76 and 0.90. Furthermore, factorial validity has been confirmed (Satow, 2012a). In the present study, only the *openness scale of the B5T* was used. This subscale consists of 10 items measured on a 4-point Likert scale (strongly disagree—somewhat disagree—somewhat agree—strongly agree). An example item is “I always enjoy learning new things.” The

openness scale of the B5T achieves acceptable reliability with Cronbach's alpha = 0.76.

Satow (2021) reassessed the validity and reliability of the B5T as part of a re-normalization using a larger sample ( $n = 21048$ ). The test's psychometric quality was confirmed.

## 2.2.3 Measurement of experienced self-transcendence

Self-transcendence was measured using the *Awe Experience Scale* (AWE-S) according to Yaden et al. (2018). It measures the state of self-transcendence via a self-report questionnaire using 30 items, measured on a 7-point Likert scale (strongly disagree—moderately disagree—somewhat disagree—neutral—somewhat agree—moderately agree—strongly agree). An example item is “I felt a sense of communion with all living things.” The AWE-S was only available in English. Therefore, the first author translated it into German using the back-translation method described above (see Appendix B).

The confirmed 6-factor structure of the AWE-S makes it a valuable measuring instrument for the present study. The presumed mechanism of change of self-transcendence, hypothesized to be activated by CT, could thus be divided into sub-dimensions. AWE-S shows high internal consistency for each of the six factors: altered time perception ( $\alpha = 0.91$ ), self-diminishment ( $\alpha = 0.89$ ), connectedness ( $\alpha = 0.87$ ), vastness ( $\alpha = 0.85$ ), physical sensations ( $\alpha = 0.81$ ) and need for accommodation ( $\alpha = 0.80$ ). Cronbach's alpha for the English total scale is  $\alpha = 0.93$  and thus shows a high internal consistency. The scale's validity was also confirmed empirically by Yaden et al. (2018).

## 2.2.4 The procedure of the ego-state interventions

The two ego-state interventions (CT and SPL) examined are standardized in their procedure based on the seven process goals of parts work according to Fritzsche (2018), as they are taught and trained in the emTrace advanced training course “Emotion coaching with ego states” (see Figure 4).

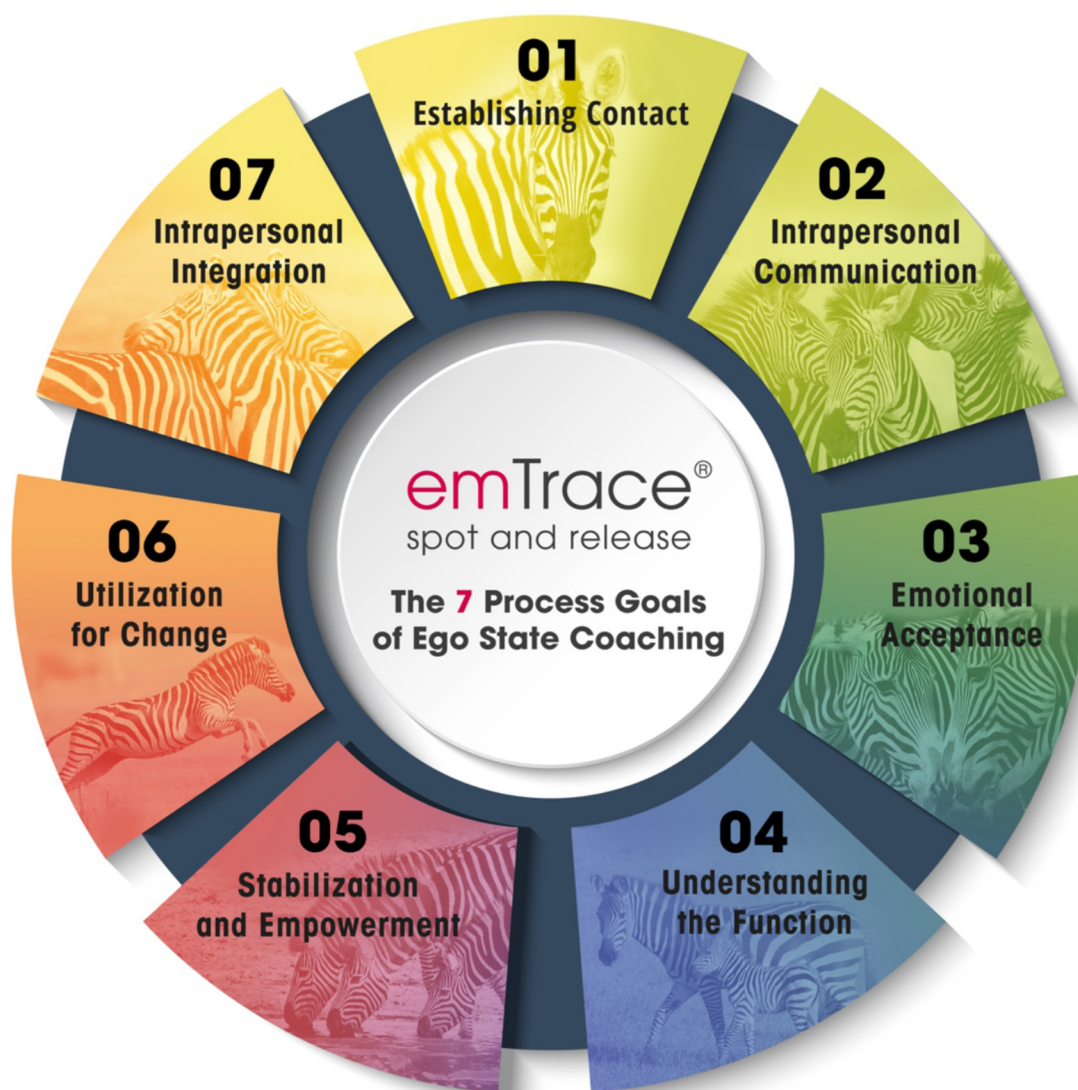


FIGURE 4  
The 7 process goals of ego-state coaching with emTrace.

To ensure that the coaches adhered to the defined structure of the ego-state interventions, they were recruited from the participants of the emTrace advanced training course “Emotion coaching with ego states” (for a detailed description of the interventions, see also Eilert, 2023). Additionally, two online workshops of 120 min each were also conducted with the participating coaches. In these workshops, the process of the two interventions was practiced. Beforehand, the coaches received two recorded video coaching sessions for each ego-state intervention, in which the first author demonstrated the coaching process. A written process description, which was given to each coach as a digital file, aimed to additionally ensure that the procedure during the intervention was adhered to. Table 1 compares the two intervention procedures along the seven process goals. The differences are in process phases 5–7. The unique feature of CT is that it aims to activate a self-transcendent

state. In contrast, SPL initiates the change via an inner creative conference.

## 3 Results

### 3.1 Descriptive statistics

#### 3.1.1 Scales

Table 2 shows the scale means, standard deviations, and internal consistency of the scales.

The internal consistency of the openness scale of the B5T can be rated as acceptable with a Cronbach's  $\alpha = 0.72$ . For the PRCA-24 and AWE-S scales, Cronbach's  $\alpha$  is between 0.91 and 0.93. The internal consistency of these two questionnaires translated into German for the present study can therefore be rated as excellent. To

TABLE 1 Comparison of Core Transformation (CT) vs. Smart Part Lab (SPL).

Process goal/phase	Core Transformation (CT)	Smart Part Lab (SPL)
1: Establishing contact	The coach guides the client to imagine a specific stressful communication situation in which the CA typically appears. The client is asked to feel the associated unpleasant body sensations. The client allows this feeling to flow into the room in front of her/him and embodies the part in the form of a creatively imagined figure. Once the part is embodied, a gaze spot at the specific position of the ego-state in space is established.	
2: Intrapersonal communication	While the client focuses on the gaze spot, the second phase of the process begins with the coach appreciating the ego-state. This should promote positive contact with the ego-state and foster the willingness to communicate. The coach then checks the willingness of the ego-state to communicate by guiding the client to ask whether the ego-state is ready to communicate.	
3: Emotional acceptance	To guide the client's emotional stabilization and thus the integration with the ego-state, the client's emotional experience is assessed. Any existing emotional stress is concretized by the client naming the stressful emotion and locating it in the body through a brief body scan. Emotion regulation is initiated through the guidance of bifocal processing (due to a dual separation of attention between the visually embodied ego state and the subjective body sensation of the client) (cf. Eilert, 2021). Processing continues until the emotional stress has been processed and the client feels emotionally stable.	
4: Understanding the function	To understand the function of the CA, the client is guided to ask the ego-state for its positive intention. As in communication with ego-states in general, the client is asked to pay attention to any signals that emerge in response – pictures, thoughts, or feelings. The client then appreciated the positive intention and feels gratitude toward the ego-state.	
5: Stabilization and empowerment	The emotional stabilization of the ego-state is conducted from a cognitive self-distanced perspective. The client focuses on the gaze spot in space and empathize with the ego-state to assess its feelings. If the ego-state is emotionally stable, the coach moves directly to resource activation, which is specific to CT. If, on the other hand, the ego-state is emotionally stressed, e.g., feeling sadness or fear, the coach guide the client through a procedure of bifocal processing to stabilize it. However, there is a crucial difference to phase 3: The stressful emotions are not experienced by the client in an associated way but are perceived in a dissociated way. Therefore, the coach asks the client where she/he “mirrors” the stress of the ego-state in one's own physical experience. The processing continues until the ego-state is perceived by the client as emotionally stable.  Resource activation in this phase is specific to CT. The aim is to uncover the <b>self-transcendent state of being</b> that is inherent in the problem state. To do this, the coach asks about the chain of positive intentions of the ego-state until the client recognizes the deepest need, the deepest positive intention of the ego-state. The deepest intention is what we refer to as the “core state”, a pivotal concept in CT.	<b>No resource activation</b> is conducted in the SPL.
6: Utilization for change	This is followed by a <b>resource transfer, specific for CT</b> . This takes place in three steps: (1) Mental transfer of the core state to general life. (2) Mental transfer of the core state to the chain of positive intentions (up to the first positive intention mentioned). (3) Mental transfer of the core state to the specific stressful communication situation (see phase 1).	The sixth phase includes the <b>inner creative conference</b> specific to SPL: The coach guides the client to establish a mental contact with her/his creative ego-state and embody it in the room as a creatively imagined figure. The client then observes how the two ego-states communicate with each other to develop new solutions. The inner creative conference continues until the client feels a sense of resolution.
7: Intrapersonal integration	The seventh phase begins in CT, specifically with the process of <b>letting the ego-state mature</b> , followed by the integration of the ego-state in the body. Then, the mental transfer of resources described in phase 6 is conducted again. An inner ecology check is carried out. The process described above is repeated with any objection ego-states. The ego-state resourcing exercise, which the client gets as a micro-transfer task from the coach in CT, consists of activating the core state for 15 s at least three times a day over the next 4 weeks.	In SPL this phase comprises an inner ecology check. The client assesses the results of the coaching process in terms of inner ecology. The coach incorporates any objections that arise directly, repeating the first five phases of the process with them. This is followed by a <b>future pace</b> in the form of the ego-state taking responsibility. Finally, all ego-states involved in this process are integrated. The ego-state resourcing of the SPL consists of activating the emotional resource (e.g., pride, gratitude, or awe), in whose motive field the positive intention of the ego-state was located, at least three times a day for 15 s over the next 4 weeks.

ensure that the German versions of these two scales can be used by other researchers, the internal consistency of the subscales is shown in Tables 3 and 4.

For the subscales of the PRCA-24, Cronbach's  $\alpha$  is between 0.79 and 0.90. The internal consistency of the subscales can, therefore, be rated as good to excellent.

For the subscales of the AWE-S (see Table 4), Cronbach's  $\alpha$  is between 0.76 and 0.91. The subscale “physical sensations” shows the lowest value at 0.76, but this can still be rated as acceptable. All other subscales show good to excellent internal consistency.

### 3.1.2 Coaching duration

The mean coaching duration was  $M = 80.3$  min ( $SD = 21.0$  min) with a minimum of 40 min and a maximum of 140 min.

The difference between interventions (CT:  $M = 82.9$  min,  $SD = 21.9$  min, SPL:  $M = 77.6$  min,  $SD = 19.8$  min) was significant,  $F_{(1,258)} = 4.28$ ,  $p = 0.04$ . However, this difference can be neglected in practice due to the usual coaching duration of 60–90 min.

## 3.2 Hypothesis testing

The three main hypotheses are tested in numerical order using a multilevel model (H1 and H2) and an ANOVA (H3). The two sub-hypotheses, H2a and H2b, are then tested using a two-sample t-test and a correlation analysis. The number of cases for the measurement times  $t_1$  to  $t_3$  was  $N = 260$ , with  $N = 244$  in the follow-up measurement ( $t_4$ ).

TABLE 2 Descriptive statistics of the scales for the present study.

Scale (number of items)	Point in time	<i>M</i>	<i>SD</i>	Cronbach's $\alpha$
PRCA-24 (24)	<i>t</i> <sub>1</sub>	81.4	15.1	0.93
	<i>t</i> <sub>3</sub>	64.1	15.1	–
	<i>t</i> <sub>4</sub>	62.9	15.2	–
SUD value (1)	<i>t</i> <sub>2a</sub>	–6.8	2.1	–
	<i>t</i> <sub>2b</sub>	3.9	3.4	–
	<i>t</i> <sub>4</sub>	3.5	3.7	–
Openness B5T (10)	<i>t</i> <sub>1</sub>	30.1	4.1	0.72
AWE-S (30)	<i>t</i> <sub>3</sub>	122.5	28.6	0.91

*t*<sub>1</sub> bis *t*<sub>3</sub>: *N* = 260; *t*<sub>4</sub>: *N* = 244.

TABLE 3 Descriptive statistics of the subscales of the PRCA-24.

Subscale (number of items)	<i>M</i>	<i>SD</i>	Cronbach's $\alpha$
Group discussions (6)	20.4	5.0	0.90
Meetings (6)	20.9	4.7	0.88
Dyadic conversations (6)	17.2	4.3	0.79
Public speaking (6)	23.0	4.7	0.85

Time of measurement *t*<sub>1</sub> (*N* = 260).

TABLE 4 Descriptive statistics of the subscales of the AWE-S.

Subscale (number of items)	<i>M</i>	<i>SD</i>	Cronbach's $\alpha$
Altered time perception (5)	21.4	7.3	0.89
Self-diminishment (5)	16.5	6.3	0.84
Connectedness (5)	22.9	7.5	0.90
Vastness (5)	23.9	7.7	0.91
Physical sensations (5)	16.9	6.6	0.76
Need for accommodation (5)	21.1	7.3	0.81

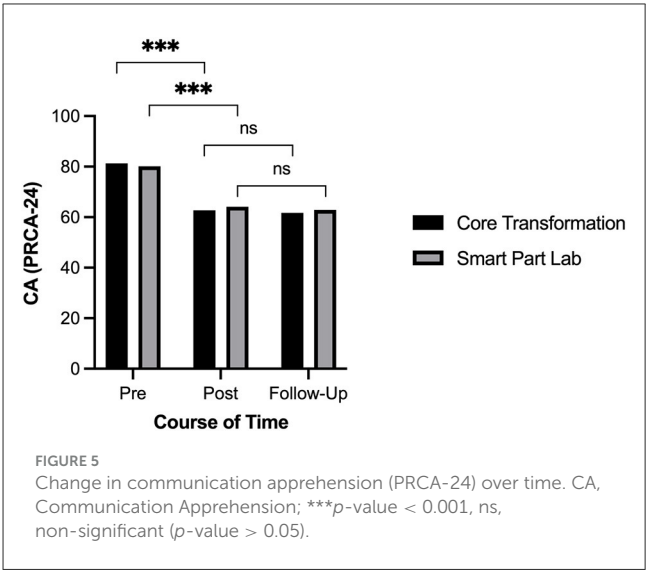
*N* = 260.

The calculations were carried out using IBM SPSS Statistics Version 28.

### 3.2.1 Effect of ego-state coaching on communication apprehension (H1)

CT and SPL groups did not differ in their PRCA-24 scores (CT: *M* = 82.3, *SD* = 15.1; SPL: *M* = 80.6, *SD* = 15.2),  $t_{(258)} = -0.90$ ,  $p = 0.37$ , nor in their SUD values (CT: *M* = –6.8, *SD* = 2.4; SPL: *M* = –6.8, *SD* = 1.8),  $t_{(258)} = -0.04$ ,  $p = 0.97$ , in relation to the measured CA.

For CA, measured by PRCA-24, the main factor time was significant for CA,  $F_{(2,258.3)} = 242.14$ ,  $p < 0.001$ , indicating differences in CA between the measuring points in time. CA decreased in both groups after the ego-state intervention (pre: *M* = 80.7; post: *M* = 63.4; follow-up: *M* = 62.3).



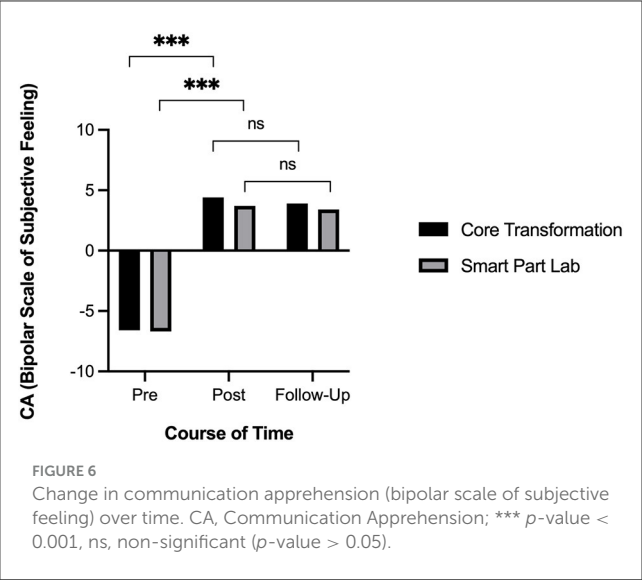
Pairwise comparisons showed that the reduction in CA was significant in relation to the estimated marginal means for the pre-post comparison ( $M_{Diff} = 17.3$ ,  $p < 0.001$ ), but not for the comparison between post-measurement and follow-up ( $M_{Diff} = 1.1$ ,  $p = 0.07$ ). Figure 5 shows the changes in the estimated marginal means for CA measured with PRCA-24 across the three measurement points (CT: pre = 81.3, post = 62.7, follow-up = 61.7; SPL: pre = 80.1, post = 64.1, follow-up = 62.9).

There was no significant difference in CA between CT and SPL,  $F_{(1,254)} = 0.09$ ,  $p = 0.76$ . The pairwise comparisons between the groups at showed no significant differences: pre-measurement ( $M_{Diff} = -1.1$ ;  $p = 0.54$ ), post-measurement ( $M_{Diff} = 1.4$ ;  $p = 0.43$ ), and follow-up ( $M_{Diff} = 1.2$ ;  $p = 0.53$ ).

The shift in the distribution of subjects across the three categories of CA in the PRCA-24 showed the extent to which the ego-state interventions reduced CA. According to Woods (2007), scores of 80 to 120 are considered as high CA, while scores of 51–79 are categorized as moderate. PRCA-24 scores below 51 correspond to a low degree of CA. In the pre-test, 54.6% of the subjects ( $n = 142$ ) were categorized with a high degree of CA, while 42.7% ( $n = 111$ ) exhibited a moderate CA, and just 2.7% ( $n = 7$ ) a low CA. After the ego-state intervention, the proportion of subjects with high CA decreased from the initial 54.6% ( $n = 142$ ) to 15.8% ( $n = 41$ ) in the post-measurement and to 11.9% ( $n = 29$ ) in the follow-up. This means that 113 out of 142 subjects who had exhibited a high CA in the pre-measurement (this corresponds to a proportion of 80%) showed only a moderate or even low degree of CA in the follow-up instead of a high degree (see Appendix C, Figures C-1–C-3).

The main factor time was also significant for CA, measured by the bipolar scale of subjective feeling,  $F_{(2,251.8)} = 1,065.40$ ,  $p < 0.001$ , indicating differences in CA between the measuring points in time. CA decreased in both groups after the ego-state intervention (pre: *M* = –6.7; post: *M* = 4.1; follow-up: *M* = 3.6). Pairwise comparisons showed that the reduction in CA was significant ( $M_{Diff} = -10.7$ ,  $p < 0.001$ ). Comparison between post-measurement and follow-up was marginally non-significant ( $M_{Diff} = 0.5$ ,  $p = 0.05$ ). However, the SUD values, which were clearly in the range of the subjective sense of resources ( $>0$ ), only decreased





minimally here, as can be seen from the mean difference. This corresponds to a consolidation of the subjective sense of resources.

Figure 6 shows the changes in the estimated marginal means for CA measured via the bipolar scale of subjective feeling across the three measurement points (CT: pre = -6.6, post = 4.4, follow-up = 3.9; SPL: pre = -6.7, post = 3.7, follow-up = 3.4).

The scores of the bipolar scale of subjective feeling between the CT and SPL groups did not differ significantly for CA,  $F_{(1,250.6)} = 2.80$ ,  $p = 0.01$ . The pairwise comparisons between the groups at the three measurement points in time showed no significant differences: pre-measurement ( $M_{Diff} = -0.1$ ;  $p = 0.74$ ), post-measurement ( $M_{Diff} = 0.8$ ;  $p = 0.08$ ), and follow-up ( $M_{Diff} = 0.5$ ;  $p = 0.28$ ).

3.2.2 Self-transcendence as a possible mechanism of change (H2)

The CT ego-state intervention ( $M = 126.8$ ,  $SD = 24.5$ ,  $n = 133$ ) resulted in an increased experience of a self-transcendent state compared to SPL ( $M = 118.1$ ,  $SD = 31.8$ ,  $n = 127$ ),  $t_{(237)} = -2.48$ ,  $p = 0.007$ . The effect size, according to Cohen (1988), was  $d = 0.28$ , which corresponds to a small effect.

The largest difference within the AWE-S subscales was found for *connectedness* (CT:  $M = 24.5$ ,  $SD = 6.7$ ; SPL:  $M = 21.2$ ,  $SD = 8.0$ ),  $t_{(245.5)} = -3.57$ ,  $p < 0.001$ . With  $d = 0.41$ , the effect size corresponds to a small to moderate effect. The subscale *vastness* showed a significant difference with a small effect (CT:  $M = 24.8$ ,  $SD = 7.2$ ; SPL:  $M = 22.8$ ,  $SD = 8.2$ ),  $t_{(249.9)} = -2.10$ ,  $p = 0.02$ ,  $d = 0.24$ . The third subscale that showed a significant difference, albeit with just a small effect, was the *altered time perception* subfacet (CT:  $M = 22.2$ ,  $SD = 6.5$ ; SPL:  $M = 20.5$ ,  $SD = 8.1$ ),  $t_{(241.6)} = -1.82$ ,  $p = 0.04$ ,  $d = 0.20$ . The other three subscales of the AWE-S (*self-diminishment*,  $p = 0.25$ ; *physical sensations*,  $p = 0.26$ ; *need for accommodation*,  $p = 0.20$ ) did not demonstrate any significant difference and are therefore not analyzed in more detail here.

A correlation analysis showed a significant positive correlation between the strength of experienced self-transcendence and the

TABLE 5 Correlation between AWE-S subscales and reduction in communication apprehension.

AWE-S subscale	<i>r</i>	<i>p</i>
Connectedness	0.35 (medium effect)	<0.001 (significant)
Vastness	0.29 (small effect)	<0.001 (significant)
Physical sensations	0.21 (small effect)	<0.001 (significant)
Altered time perception	0.20 (small effect)	<0.001 (significant)
Self-diminishment	0.09 (no effect)	0.07 (not significant)
Need for accommodation	0.06 (no effect)	0.16 (not significant)

N = 260; Interpretation of the effect sizes according to Cohen (1988).

reduction of CA,  $r = 0.28$ ,  $p < 0.001$ . According to Cohen (1988), this corresponds to a small effect. For subscales of the AWE-S, the correlations between the intensity of the feeling of the respective self-transcendence subfacet and the reduction of CA are as follows in order of their strength (see Table 5).

3.2.3 Moderator effect of “openness to experience” (H3)

The personality trait “openness to experiences” significantly influenced experienced self-transcendence in both groups,  $F_{(1,253)} = 5.77$ ,  $p = 0.02$ . According to Cohen (1988), the effect size was  $r = 0.14$ ,  $p = 0.01$ , which corresponds to a small effect. The interaction effect *Group*  $\times$  *Openness* was not significant,  $F_{(1,253)} = 0.61$ ,  $p = 0.43$ .

4 Discussion

4.1 Interpretation of results

The study’s results demonstrate that an online ego-state coaching with emTrace, lasting on average 80 min, can reduce communication apprehension. Thus, the first hypothesis was confirmed. Two weeks after the intervention, the reduction in communication apprehension remained stable.

We hypothesized that one of the possible mechanisms of change is that the ego-state intervention activates a self-transcendent state. We expected that the higher the self-transcendence induced by the intervention, the greater the reduction in communication apprehension. But although the activation of a self-transcendent state was increased to a greater extent by Core Transformation than Smart Part Lab (H2a), contrary to the second hypothesis, this did not result in an increased reduction in communication apprehension. Both ego-state interventions reduced communication apprehension to the same extent. Thus, the second hypothesis could not be confirmed. The results indicate that the activation of a self-transcendent state seems not to be the mechanism of change for reducing communication apprehension.

The third hypothesis was fully confirmed: The greater the degree of openness in the client’s personality, the more intensively the intervention could activate a self-transcendent state. Except

for the second main hypothesis, the results confirmed all the initial assumptions.

In relation to the first hypothesis, it could be shown that the effect of communication apprehension reduction seems to be large. Eight percent of the subjects who showed a high level of communication apprehension before the coaching showed only a moderate or low degree of communication apprehension in the follow-up. The effect of the ego-state intervention was, therefore, both effective and sustainable over a period of 2 weeks after the coaching. This effect can be considered remarkable, as communication apprehension is defined as trait anxiety according to McCroskey (1977). The PRCA-24 does not just measure anxiety in a specific situation (such as an exam or presentation) but across four contexts (public speaking, group discussion, meetings, dyadic conversations). This means that the subjects' communication apprehension was seemingly not only reduced in relation to the situation focused on in the coaching, but a positive effect was found across all contexts.

For the second hypothesis, the question arises as to why the Core Transformation, contrary to the second hypothesis, did not reduce communication apprehension to a greater extent than the Smart Part Lab, and this despite (a) a more intensive activation of self-transcendence and (b) the correlation between self-transcendence and reduction of communication apprehension.

Other mechanisms besides self-transcendence may reduce communication apprehension, but these were not measured in the present study. These alternative mechanisms may explain the positive effect of Smart Part Lab. Some possible alternative mechanisms of change are listed here as examples. Mechanisms that both ego-state interventions share are, for example, (a) *self-distancing* (cf. process goal 1): Studies have not only shown that self-distancing—as achieved in both ego-state interventions through the dissociated perception of the ego-state—can regulate stressful feelings, but can also increase the sense of resources (see e.g., Kross and Ayduk, 2017; Dorfman et al., 2019); (b) *emotion regulation* of stressful feelings through bifocal processing (cf. process goals 3 and 5): Nachreiner (2020) has already demonstrated that bifocal processing as part of emTrace coaching can effectively reduce test anxiety; (c) *positive reappraisal* of communication apprehension (cf. process goal 4): By exploring the positive intention of the ego-state, a positive reappraisal of the communication apprehension takes place. This cognitive coping strategy changes the subjective perspective regarding a situation that the person experiences as stressful in such a way that it is perceived as valuable. It thus changes the emotional valence: the person experiences pleasant feelings instead of unpleasant ones (Folkman and Moskowitz, 2000).

Also worth mentioning are common factors, such as the working alliance between coach and client (see Grawe, 2004). In addition, there are potential mechanisms of change specific to Smart Part Lab, e.g., the imagination of a creative ego-state could reduce communication apprehension. For example, Tabrizi and Yaacob (2011) showed that creative thinking can help reduce anxiety.

The third hypothesis, that there is a correlation between openness to experiences in the client's personality and the activation of a self-transcendent state, was confirmed. However, the effect size was very small; therefore, this finding has no practical meaning.

## 4.2 Implications

### 4.2.1 Theoretical implications

The results show that a single intervention can not only reduce stressful emotional states, such as test anxiety (e.g., Nachreiner, 2020), but the change can also address cross-contextual patterns of emotional stress (here, communication apprehension as trait anxiety). Especially for people who do not believe such a change is possible, the information about the study results can foster a growth mindset, which reflects the attitude that personal characteristics can be developed (e.g., Yeager and Dweck, 2020). In particular, a growth mindset regarding the changeability of anxiety correlates positively with an emotionally resilient response in relation to stressful life events (Schroder et al., 2017).

The falsification of the second main hypothesis shows that the activation of self-transcendence does not seem to be a mechanism of change in ego-state coaching for reducing communication apprehension. Despite an increased activation of self-transcendence by Core Transformation, it did not reduce communication apprehension more than the Smart Part Lab. This finding contrasts with previous research emphasizing the positive effects of self-transcendent states on emotional resilience and cognitive flexibility. For instance, self-transcendent states have been shown to reduce ruminative thinking and repetitive problem-focused thought patterns (e.g., Tarani, 2017). Moreover, eliciting self-transcendent emotions such as awe has been found to buffer individuals against the negative impact of feedback (Atamba, 2019). Experimental studies further demonstrate that awe can shift individuals' perception of upcoming challenges, making them appear less threatening or overwhelming (Le et al., 2019). In addition, activating self-transcendent states has been linked to greater creative thinking and increased openness to experience (Chirico et al., 2018; Stancato and Keltner, 2019). Thus, the Zen Buddhist axiom "no self, no problem" seems to resonate with the theoretical perspective, yet may not translate directly into measurable reductions in communication apprehension within short-term coaching interventions. One possible explanation is that the positive effects of self-transcendence may be more diffuse, general, or long-term in nature and therefore not directly reflected in trait-like constructs such as communication apprehension after a single intervention. Alternatively, the mechanisms by which self-transcendent states exert their influence may not align closely with the specific emotional and cognitive patterns that sustain communication apprehension.

### 4.2.2 Practical implications

The finding that an online ego-state-intervention with emTrace can reduce communication apprehension effectively, gives emotion coaches a secure basis for offering online coaching, particularly in relation to reducing communication apprehension. The average coaching duration of around 80 min provides an orientation as to how much time should be planned for a mean coaching session with an ego-state intervention.

The results also show the effectiveness of online seminars. This is because the emotion coaches who participated in this study were all trained in relation to the conducted ego-state interventions

in a 4-day emTrace online seminar. The theory was also taught via a specially developed interactive online training course. This shows that learning coaching interventions in an online setting is possible.

The confirmation of the first hypothesis, combined with the rejection of the second main hypothesis, gives coaches more freedom and flexibility in their choice of intervention. Since Core Transformation and Smart Part Lab did not differ in their effect on reducing communication apprehension, the coach is free to choose which ego-state intervention to use in practice. This shows that it seems to make more sense as a coach to think in terms of process goals of ego-state coaching than in terms of concrete ego-state interventions, which are fixed in their steps.

### 4.3 Limitations

Regarding the internal validity of the study, it should be positively emphasized that communication apprehension was measured with two different scales (PRCA-24 and SUD values), each of which has a different perspective on the variable. From the perspective of both scales, it was confirmed that ego-state coaching reduces communication apprehension. The SUD values measured showed that, on average, clients not only felt less stress about the anxiety-inducing situation they chose for the intervention but also rated the situation more positively and associated it with pleasant feelings.

What may also have heightened the internal validity is that the coaches were not informed about the hypotheses before conducting the coaching. This is particularly important for the second hypothesis. Because it means that the coaches did not know that the Core Transformation was expected to reduce communication apprehension to a greater extent than the Smart Part Lab. In this way, expectation effects of a different strength of the respective intervention could be reduced. This is because the coach's expectation of the intervention can also have an influence on the client's emotional change (e.g., [Rosenthal and Jacobson, 1968](#)).

One limitation of the study could be that it was not assessed how reliably the coaches adhered to the specific intervention process descriptions despite the precautions taken (e.g., detailed intervention procedures, online training in advance). This could have led to a “mixing” of the intervention process descriptions without being noticed. The intervention adherence should be investigated in further studies using two short questions after the coaching conduction: “Did you stick to the process description? At which points did you deviate from the standard process?”

All scales used in the present study showed good to excellent internal consistency. Only the openness scale of the B5T was at the lower limit of acceptable reliability. In a further study, alternative questionnaires should be used that show higher internal consistency, such as the openness scale of the NEO-PI-R with a Cronbach's alpha of 0.89 ([Berth and Goldschmidt, 2006](#)).

In relation to external validity, the high number of subjects who participated in this study should be emphasized. This increases the generalizability of the results to the focused population of female and male people in German-speaking countries who

suffer from communication apprehension and are willing to consult a coach to reduce their communication apprehension. The fact that the study was a field experiment also improves the external validity.

It should be critically noted that more women than men took part in the study—both among the coaches (64.2% female) and among the clients (77.3% female). In principle, this could limit the generalizability of the results for male clients or coaches, but generally reflects the gender structure of the coaching market ([Rauen, 2020](#)). For this reason, it would have been difficult to realize an equal distribution of clients and coaches in relation to gender. This would have been at the detriment of both the number of test subjects and the number of participating coaches.

Another limitation relates to the educational background of the sample. The participants in the present study were predominantly highly educated, which raises the question of whether the intervention effects can be generalized to populations with lower educational attainment. Both ego-state interventions—Core Transformation and Smart Part Lab—require a certain degree of introspective ability, abstract thinking, and cognitive engagement. It is conceivable that individuals with lower levels of formal education, or those less familiar with inner imagery and reflective dialogue, might find it more difficult to fully access and benefit from these interventions. Future studies should therefore investigate whether and how the effectiveness of ego-state coaching varies as a function of educational background or cognitive style. This could be addressed by including a more diverse sample and by exploring potential adaptations of the intervention procedures for broader accessibility.

### 4.4 Outlook and conclusion

Future research could investigate the long-term stability of the observed effects beyond the 2-week follow-up period. Since communication apprehension is considered a relatively stable trait, it would be valuable to examine whether ego-state coaching can produce sustained changes in communication behavior over several months or in real-life performance contexts.

In addition, further studies could focus on identifying which process components of ego-state coaching are most relevant for reducing communication apprehension. By comparing different process elements (e.g., self-distancing, bifocal processing, or positive reappraisal) across interventions, future research could shed light on the specific active ingredients that contribute to change.

Finally, subsequent studies could systematically explore how individual characteristics, such as educational background or cognitive style, influence the effectiveness of ego-state interventions. This would help to further tailor coaching methods to different target groups and improve accessibility, especially for clients with limited experience in introspective or abstract thinking.

To summarize, the results of the present study have shown that ego-state online coaching with emTrace can effectively reduce a person's communication apprehension. In this way, these findings strengthen the empirical foundation for the use of emotion-focused interventions in coaching practice and emphasize their

potential to empower individuals who experience communication apprehension to engage more openly and self-confidently in interpersonal situations. As communication apprehension affects not only communicative effectiveness but also psychological wellbeing and social connectedness, the ability to reduce it through low-threshold coaching formats may offer substantial benefits, not only for individuals but also from a broader social and public health perspective.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by Institutional Ethics Committee of the Euro-FH, University of Applied Sciences, Hamburg, Germany (protocol code EKEFHS07/24). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

DE: Conceptualization, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. PM: Project administration, Software, Writing – review & editing. MS: Conceptualization, Supervision, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Correction note

**31/07/2025** A correction has been made to this article. Details can be found at: [10.3389/forgp.2025.1487283](https://doi.org/10.3389/forgp.2025.1487283).

**01/08/2025** This article has been corrected with minor changes. These changes do not impact the scientific content of the article.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/forgp.2025.1487283/full#supplementary-material>



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