

3 **Cognitive, affective, and behavioural effects of temporal comparison with**
4 **prior aversive experiences in individuals with social anxiety: Registered**
5 **Report Stage 1**

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Abstract

Temporal comparisons with past selves have been found to influence current self-appraisals of attributes, including well-being. The comparison process involves using a past self as a standard, while the current self serves as the target. Previous evidence has shown that focusing on differences (versus similarities) when comparing with a past extroverted self will lead to lower (versus higher) current ratings of extraversion, indicating contrast (versus assimilation) effects. We extend previous research by investigating a subclinical social anxiety sample and including a behavioural task. We will prime comparison focus on differences or similarities, as well as manipulating perceived temporal distance (or closeness) to a negative past self. The research protocol consists of a lab study with two conditions: differences versus similarities focus. Participants (N=160) meeting inclusion criteria will be randomly assigned to one of the two conditions and asked to recall a negative memory. The experimental manipulation first involves a selective accessibility paradigm priming comparison focus, followed by instructions to describe the negative memory emphasizing the respective distant or close temporal perspective. A visual manipulation of temporal distance is also employed using timelines designed to reduce or increase the perception of temporal closeness of the event to today. A temporal discrimination task follows where participants list negative attributes that have changed or stayed the same, respective of the differences or similarities condition. The manipulation is followed by an impromptu speech task to replicate a social-evaluative situation that will be recorded and later rated by experimenters blinded to condition. We expect a focus on differences (versus similarities) will cause lower (versus higher) ratings of similarity with the past self, lower (versus higher) current fear of negative evaluation (FNE) and higher (versus lower) ratings of past FNE, less (versus more) negative affect, as well as better (versus worse) performance evaluations in an anxiety-provoking situation.

1 *Keywords:* temporal comparison, social anxiety, memory, psychological distance, self-appraisal

Cognitive, affective and behavioural effects of temporal comparison with prior aversive experiences in individuals with social anxiety: Registered Report Stage 1

Temporal comparison processes are ubiquitous in self-appraisals and their outcomes can elicit emotional, cognitive and behavioural responses (Morina, 2021). Temporal comparisons help us to perceive personal change over time by observing and understanding progress (Albert, 1977), such as improvements in ourselves over time (Wilson & Ross, 2000). Favourable temporal comparisons (e.g., perceiving oneself as more attractive compared to 1 year ago) can lead to improved self-esteem as a form of self-enhancement, whereby individuals distance their current self-appraisals from past negative selves (Ross & Wilson, 2002). However, comparisons to negative past selves can also lead to negative outcomes such as reduced self-esteem, for example when current mood is congruent with the negative memory and the past self is perceived as temporally close (Gebauer et al., 2008). The Selective Accessibility Model (SAM; Mussweiler, 2003) suggests that comparison focus on similarities or differences will lead to respective assimilation or contrast effects. For example, perceiving one's current mood as consistent with a negative past memory will trigger a search for evidence (i.e., similarities) to support this. Subsequently, ~~manifested~~ assimilation of a negative past self into the current self can lead to reduced self-esteem. Temporal comparison processes therefore influence mental health, and evidence indeed shows that temporal self-appraisals are negatively affected by anxiety and depression (Sokol et al., 2022; Sokol & Serper, 2017). Manipulating ~~comparison the~~ focus on similarities or differences in temporal comparisons has shown subsequent assimilation and contrast effects on ~~subsequent~~ self-appraisals (Hanko et al., 2009). ~~while p~~ Perceived temporal distance has also been found to produce assimilation and contrast effects with recalled past selves (Broemer et al., 2008). However, to our knowledge, no research has investigated these effects in (sub-)clinical samples, and it remains unclear whether contrast and assimilation effects influence symptoms

of clinical social anxiety. Negative perceptions of past selves are indeed relevant to social anxiety, with shame memories often acting as reference points. Memories of aversive past events shape current self-perceptions and can provoke current worry or fear of negative evaluations (Matos et al., 2013). It is therefore important to investigate how manipulating recall of past negative selves may produce assimilation and contrast effects on self-appraisals and subsequent indicators of mental health in a clinically relevant sample. In this paper we present an experimental paradigm to assess whether manipulating comparison focus influences the impact of temporal perceptions of an aversive memory on social anxiety, affect, and behaviour.

Temporal Comparison Theory

Temporal comparison provides us with the opportunity to establish continuity of the self over time, using prior selves as a source of information for current self-appraisal (Albert, 1977). Most humans focus on personal improvement and perceive their personal development over time as positive, indicating a self-enhancement motive in temporal comparison (O'Brien & Kardas, 2016). Temporal Self-Appraisal Theory posits that individuals evaluate their past selves in ways that enhance their current self-perception, often perceiving former selves as inferior and temporally distant compared to their present self (Ross & Wilson, 2003). In contrast, more recent past selves will be more favourably appraised and past successes regarded as more recent. Arguably, this self-enhancement bias is maintained by contrasting focusing on differences between the current self and negative past selves (i.e., contrasting), while perceiving-focusing on similarities with positive past selves (i.e., assimilating; Ross & Wilson, 2002). This phenomenon occurs even when self-appraisals show no actual improvement over time: Wilson and Ross used a longitudinal design in several studies to assess comparisons between current and retrospective self-appraisals two months apart (Wilson & Ross, 2001). Students rated their current selves on seven traits (T1), then again

two months later (T2) and re-evaluated their past selves of 2 months prior on the same traits. Results were consistent with a self-enhancement bias, whereby appraisals of past selves were more negative than of current selves at T2, indicating perceived improvement, despite there being no actual improvement between concurrent appraisals. This suggests that past selves are often perceived less favourably than they actually were, leading to relatively more favourable appraisals of the current self (i.e., satisfying a self-enhancement motive). In the present study, we aim to utilize the temporal comparison process to manipulate self-appraisals. A key aspect of this process is the occurrence of temporal contrast and assimilation effects, as explained in the following.

Assimilation-Contrast Effects in the Comparison Process

Temporal comparison can be understood as a process of (dis)similarity testing between the current self (i.e., the target) and a past self (i.e., the standard). This process is primed by the selective accessibility of hypothesis-(in)congruent information (Mussweiler, 2003). Specifically, when individuals are primed to focus on similarities versus differences with a comparison standard, assimilation versus contrast effects are likely to occur, respectively (Mussweiler, 2020). Assimilation implies that target evaluations shift toward the standard, whereas contrast means that evaluations shift away from the standard. For example, the students in the Wilson and Ross (2001) study described above may have expected differences with their ~~prior-past~~ selves due to the self-enhancement bias. Accordingly, they were primed to focus on differences and ~~selectively-accessed~~select information supporting their expectation that change has occurred, contrasting their current self from the past self. As a result, they evaluated their past attributes as worse than their current attributes.

Recent evidence also suggests that by priming comparison focus, one can manipulate the outcomes of the temporal comparison process. Hanko and colleagues experimentally examined the role of comparison focus on assimilation and contrast effects in temporal

comparisons of extraversion (Hanko et al., 2009). They used a procedural priming task based on Mussweiler (2001), originally developed for exploring assimilation-contrast effects in social comparisons. The priming task induced a focus on similarities or differences, before participants wrote about a past extraverted or introverted self. This was followed by self-report measures of extraversion. The procedural priming task consisted of three trials, during which participants were asked to compare pairs of pictures. In the similarities condition, participants were required to list three similarities between each pair of pictures, whereas the differences group were asked to list differences. Results showed that participants who were primed to focus on differences rated themselves as being more extraverted after writing about a past introverted self, than those who wrote about a past extraverted self. Furthermore, participants in the similarities condition rated themselves as more extraverted after writing about a past extraverted self than those who wrote about a past introverted self. Their findings suggested that priming (dis)similarity focus can foster contrast and assimilation effects on self-appraisals of extraversion. These effects on a stable concept such as extraversion have implications for further use of managing perceptions in other psychological concepts, such as anxiety. Expanding these findings in clinical samples could provide a novel mechanism of change for therapeutic interventions. It is therefore important to consider further useful mechanisms in the temporal comparison process, particularly perceptions of temporal distance to temporal selves.

Perceived Temporal Distance

Perceived temporal distance refers to the psychological proximity to a past memory and has a significant impact on the way past selves are perceived and appraised. Wilson and Ross (2001) manipulated perceived temporal distance to past selves in two conditions of a student sample, while keeping actual temporal distance constant. Participants were asked to rate their current selves on seven desirable (e.g., self-confident) and three undesirable (e.g.,

immature) attributes, then instructed to appraise past selves from the semester start on the same attributes. The distant condition used instructions emphasizing the distance (e.g., “*all the way back ...*”), whereas the recent condition used instructions implying recency (e.g., “*in the recent past...*”) when referring to the beginning of the semester. They found that the attributes were evaluated less favourably and as less similar to current selves in the distant condition (i.e., denigrating past selves) than in the recent condition.

Wilson and colleagues later extended these findings to aversive memories among university students (Wilson et al., 2009). Specifically, they instructed students who had felt socially unpopular in high school to rate the temporal distance between now and the timepoint of “high school” on a spatial scale. To manipulate distance, this scale either ranged from ‘Birth’ to ‘Today’ (i.e., spanning the entire lifetime) or from ‘Age 16’ to ‘Today’ (i.e., spanning only more recent years). The different ranges manipulated how spatially close or distant participants rated their high school years on the scale, thus fostering the impression that an event has occurred more recently (when rated relative to the lifespan) or longer ago (when rated relative to age 16). As expected, participants in the distant condition reported that the event felt more distant than those in the close condition. Critically, ratings of current social competence were also more favourable in the distant group compared to the close group. Taken together, evidence supports the idea that manipulating temporal distance can also influence perceptions of past selves, as well as appraisals of the current self, such as desirable attributes and social competence.

It is plausible that a stronger sense of temporal distance from a negative memory may make contrast effects more likely. For instance, it is well-documented that emotional memories tend to decrease in ~~ffective~~ emotive intensity over time, and this effect is stronger for negative than for positive memories (i.e., fading affect bias; Kensinger & Ford, 2020; Skowronski et al., 2014; Walker et al., 1997). This pattern aligns with the view that memory

is biased to neglect negative experiences to preserve positive self-views (Sedikides et al., 2016). However, recent research has pointed out that negative affective intensity of negative memories remains constant in many cases, and it may also increase or fluctuate (Hoehne & Zimprich, 2024). Since autobiographical memories are ~~believed to be~~likely reconstructed each time they are retrieved (Conway, 2005), subjective temporal proximity may be more important than the objective passage of time. Indeed, various studies have found that the emotionality of autobiographical memories is ~~negatively~~linked to a ~~sense-lack~~ of closure (i.e., that the event is ~~not~~ closed ~~as opposed to open, unsettled, or~~ not yet behind oneself; Beike & Wirth-Beaumont, 2005) and psychological distancing (Meyer et al., 2022) – the ~~feeling of closure and psychological distance~~perception of temporal and personal separation between the past and the present situation and self (Sutin & Robins, 2007). This type of closure or distance from past negative emotional experiences may be reduced in individuals with anxiety or depression, characterized by a reduced fading affect bias (Walker et al., 2014). Thus, an experimental manipulation of comparison focus on (dis)similarities and temporal distance may significantly alter the phenomenology of aversive memories, with high relevance to social anxiety.

Temporal Comparisons Relevant to Social Anxiety and Affective Disorders

Social anxiety is characterized by repetitive negative thinking typically focused on past failures and self-perception (Modini & Abbott, 2016), which often involves shame memories (Matos et al., 2013). For example, fear of negative evaluation is associated with recurrent negative images of past social situations, which has been associated with the onset of social anxiety disorder (Hackmann et al., 2000). In line with this view, Edwards et al. (2003) found that high socially anxious individuals showed a negative memory bias when recalling a social-evaluative performance, compared to a low social anxiety group. They had participants give an impromptu speech and afterwards provided balanced feedback (50%

positive, 50% negative). A week later, the high social anxiety group reported more focus on the negative feedback and more rumination than the low anxiety group. This supports the idea that negative self-appraisals associated with past social memories inform current social self-perceptions and contribute to psychopathology among socially anxious individuals (Gregory et al., 2016; O'Toole et al., 2016). Accordingly, temporal distancing from negative memories may offer a mechanism for interventions seeking to reduce reexperiencing and/or rumination.

Temporal comparisons have also been associated with several other mental health disorders. For instance, individuals with high anxiety and/or high depression levels have been found to make more negative self-appraisals for past, current, and future selves than healthy controls (Mathews et al., 2020; Sokol et al., 2022). When rating past, current and future selves on positive and negative traits, depressive individuals perceived no improvement from past to present (Mathews et al., 2020; Sokol & Serper, 2017) or even rated their past selves more favourably (Sokol et al., 2022), indicating an absence of a self-enhancement bias that is characteristic for healthy individuals. Onset of depressive phases have also been identified as negative temporal landmarks, whereby the past self prior to the landmark is viewed more favourably than the current self (Abbey et al., 2021). Moreover, anxiety and depression traits are associated with distorted perceptions of temporal distance (Rinaldi et al., 2017), such as increased perceived temporal distance from positive events for depression, or perceived temporal closeness with negative events in PTSD (Janssen et al., 2015). Past successes are therefore attributed to previous selves in contrast to the current selves, whereas perceived failures are attributed to current selves, indicating a lack of the self-enhancement bias often observed in healthy populations. The literature suggests that dysfunctional comparison habits may contribute to pathological behaviours and cognitions. The manipulation of assimilation

and contrast with prior negative experiences could provide a potential avenue for novel interventions in psychological disorders aiming to improve mental health.

Research Questions

In the present study, we investigate whether contrast or assimilation effects with a negative past self can be induced in a student sample with elevated, sub-clinical levels of social anxiety using an experimental manipulation of comparison focus (Hanko et al., 2009; Mussweiler, 2001). Specifically, we aim to manipulate perceptions of temporal distance to memories of an aversive social situation (in which participants felt embarrassment, humiliation, and/or shame) along with a comparison focus on differences or similarities with the past self. This should lead to contrast versus assimilation effects on several outcomes. First, we expect to observe higher ratings of perceived similarity with the past selves in the similarities condition than in the differences condition (RQ1). Similarly, we expect lower social anxiety ratings in the differences condition than in the similarities condition (RQ2). Next, we expect lower levels of negative affect in the differences condition than in similarities condition (RQ3). Finally, behavioural performance in context of social anxiety, assessed via a speech task, will be more positively rated in the differences condition than in the similarities condition (RQ4).

Empirical Approach

We developed a paradigm modelled after Mussweiler's (2012) priming of comparison focus, which has been successfully adapted to temporal comparisons (Hanko et al., 2009), and combined this with a temporal discrimination task to leverage perceived temporal differences or similarities. The *differences* condition will be primed to focus on differences, especially with past negative attributes related to the negative event, while the *similarities* condition will be primed to focus on similarities, especially with past negative attributes related to the negative event.

Speech tasks have been shown to replicate social-evaluative situations often feared or avoided by socially anxious individuals (Edwards et al., 2003). We will employ a speech task protocol involving an impromptu five-minute presentation with rater-coded and self-reported performance measures, based on prior research using behavioural assessments in social anxiety (Kampmann et al., 2016).

As the main dependent variables, we will assess perceived similarity with the past self, social anxiety, ~~positive and~~ negative affect, and speech performance. ~~Depression will also be measured at baseline to control for potential baseline group differences when assessing affect.~~ As a core dimension of social-evaluative anxiety, fear of negative evaluation (FNE; Watson & Friend, 1969) will operate as the attribute of self-appraisal for the current and past selves. Current FNE will be assessed post-manipulation immediately prior to the impending speech task, and past-self FNE will be assessed post-speech at the end of the experiment (as not to interfere with the experimental manipulation). This allows comparisons between past-self and in-situ evaluations of social anxiety. Perceived similarity with the past self, as well as ~~Positive and n~~negative affect ratings, will be assessed at three time points: ~~pre-manipulation~~baseline, post-manipulation, and post-speech task. ~~Psychological distance will be measured at post-manipulation, while s~~Speech performance will be assessed post-speech, ~~as will be similarity with the past self. We also measure psychological distance at post-~~manipulation as part of a manipulation checks.

Manipulation Checks

We expect there to be two observable group effects as a direct result of the manipulation. First, the ratings of temporal distance on a manipulated timeline (Figure 1) are expected to be lower in the differences condition than in the similarities condition (MC1), which will be tested using an independent groups t-test. This would indicate that the manipulation successfully influences participants to rate the recalled event as closer or more

distant from ‘today’ in the respective similarities and differences conditions. Second, the manipulation should yield significantly higher scores on psychological distance (as measured with the Memory Experiences Questionnaire) in the differences relative to the similarities group (MC2), which will be tested using an independent groups t-test. In the case that MC1 is not confirmed but MC2 is, we would assume that the spatiotemporal timeline is not representative of elapsed time. Conversely, if MC1 is confirmed but MC2 is not, we would assume that priming comparison focus has not had the desired effect on perceived psychological distance from the past self. Alternatively, it could imply that effects of the temporal comparison on self-appraisals are stable and not affected by assimilation or contrast effects of comparison focus. If any of the following hypotheses are supported but MC2 is not confirmed, this would suggest that comparison focus effects cannot be attributed to perceived temporal distance. Therefore, we will investigate group differences on outcomes even when MC1 and/or MC2 are not confirmed.

Hypotheses

An overview of the design, research questions and hypotheses can be found in Table 1. As per RQ1, we expect ratings of perceived similarity with the past self to decrease from baseline to post-manipulation in the *differences* group and to increase in the *similarities* group, reflecting a time \times condition interaction (H1a). Furthermore, we expect higher similarity ratings at post-speech (relative to baseline) for the *similarities* group than the *differences* group (H1b). Next, we also expect lower ratings of current fear of negative evaluation (RQ2) in the *differences* (vs. *similarities*) group prior to the speech task (H2a), which would also be reflected in larger differences between current and past ratings of fear of negative evaluation for the *difference* (vs. *similarities*) group (H2b). As per RQ3, we predict larger increases in negative affect from baseline to post-manipulation for the *similarities* group compared to the *differences* group (H3), whereby this effect is expected to carry over to

- 1 the post-speech assessment. We also predict more positive self-reported (H4a) and rater-
- 2 coded assessments (H4b) of speech performance for the differences group relative to the
- 3 similarities group (RQ4).

1 **Table 1**2 *Research questions, hypotheses, and statistical analyses*

Question	Hypotheses	Sampling plan	Analysis Plan	Rationale for deciding the sensitivity of the test for confirming or disconfirming the hypothesis	Interpretation given different outcomes	Theory that could be shown wrong by the outcomes
RQ1: Does the manipulation yield group differences on perceived similarity with the past self?	H1a: The change in perceived similarity with the past self will be more negative in the differences than in the similarities group. H1b: Ratings of perceived similarity at post-speech will be higher in the similarity than in the differences group.	$N = 160$ to achieve 88.6% power for detecting a medium-size group \times time interaction from baseline to post-manipulation with $\alpha = .05$, and 80.0% power for slightly smaller effects from baseline to post-speech.	2(comparison focus) \times 3(time: baseline, post-manipulation, post-speech) repeated measures ANOVA. Planned contrasts will examine post-manipulation and post-speech group differences relative to baseline. Bayes factor RM ANOVA.	For the repeated measure ANOVAS medium effect size estimates ($f = 0.50$, $f = 0.45$) were chosen. These are based on a medium effect size ($\eta^2_p = .07$) of the interaction between comparison focus and recall type on the outcome of extraversion reported in a source study (Hanko et al., 2009). For the MANOVA we assumed a scenario with one medium ($f = 0.50$)	H1a will be confirmed by a group \times time interaction effect from baseline to post-manipulation. H1b will be confirmed by the interaction effect of group on changes from baseline to post-speech. This would indicate that the experimental manipulation induced the expected contrast or assimilation effects on perceived similarity. Evidence for the null hypothesis would be regarded as moderate with $3 < BF_{01} \leq 10$ for the interaction effects.	Previous research has shown that perceived temporal distance with past selves corresponds to perceived similarity, i.e., closeness-similar, distance-different. Opposite effects would indicate that selective accessibility model does not account for cognitions in socially anxious individuals and would require further investigation.
RQ2: Does comparison focus lead to assimilation or contrast effects on social anxiety ratings for the current and past selves?	H2a: Current fear of negative evaluation will be lower in the differences than the similarities group at pre-speech. H2b: The differences group will exhibit a larger difference between current and		2(comparison focus) \times 2(FNE assessment: current, past) repeated measures ANOVA for FNE with planned simple effect of comparison focus on current FNE. Bayes factor RM		H2a will be confirmed by a simple effect of comparison focus on current FNE. H2b will be confirmed by the group \times anxiety assessment interaction effect. This would indicate that the experimental manipulation can influence current social anxiety symptoms. Evidence for the null hypothesis	Self-appraisals are affected by temporal comparison focus and perceived temporal distance. However, it has not been tested whether this influences fear of negative evaluation in the present. If this is the case, this would indicate that anxiety is not a stable characteristic but depends on assimilative or contrastive

	past fear of negative evaluation than the similarities group, which will exhibit little to no difference between the two ratings.		ANOVA.	and one small ($f = 0.20$) effect size.	would be regarded as moderate with $3 < BF_{01} \leq 10$ for the interaction effects.	comparison effects.
RQ3: Does a comparison focus on differences or similarities with a past negative self lead to changes in positive and/or negative affect?	H3a: The change in negative affect ratings from baseline to post-speech will be smaller in the differences than in the similarities group.		2(comparison focus) x 3(time: baseline, post-manipulation, post-speech) repeated measures ANOVAs on PANAS-NA with interaction contrasts focusing on interactions of comparison focus with the change from baseline to post-manipulation, and from baseline to post-speech. Bayes factor RM ANOVA.		H3a and H3b will be confirmed by interaction effects of comparison focus and time on negative affect. These effects would show that a comparison focus can influence negative affect on the short term and/or following a speech task. Evidence for the null hypothesis would be regarded as moderate with $3 < BF_{01} \leq 10$ for the interaction effects.	Previous research has shown that mental health indicators, such as self-esteem, are affected by perceived temporal distance. To our knowledge, change in positive and negative affect has not been tested in a socially anxious sample. Evidence for the opposite expected effect would indicate mood effects do not align with expected appraisals of past selves when comparison focus is primed to elicit contrast and assimilation effects, which would require further investigation into other mechanisms in the comparison process, such as emotional responses.
RQ4: Does the manipulation yield group differences in social performance?	H4a: Self-ratings of the speech performance are more positive for the differences group than the similarities group. H4b: Observer-ratings of the speech performance are more positive for the differences group than the similarities group.		MANOVA with group as a fixed factor on outcomes of Self- and Observer-ratings of the Public Speaking Performance Measure, complemented by univariate ANOVAs for each dependent variable. Bayes factor (M)ANOVA.		H4a and H4b will be confirmed by multivariate group effects on self- and other-ratings of speech performance in combination with respective univariate group effect. Significant group effects would indicate that comparison focus influences performance of subclinical socially anxious individuals in a social task. Evidence for the null hypothesis would be regarded as moderate with $3 < BF_{01} \leq 10$ for the main effect of group.	Previous research has shown that self-appraisals are affected by temporal comparisons and perceived temporal distance. Yet to our knowledge, this has not been assessed as part of a performance task. Likewise for external raters of performance. Evidence for the opposite expected effects would indicate that previous findings in non-clinical samples are not generalizable to (sub)clinical samples.

Proposed Materials and Methods

The proposed study is based on preliminary data that we collected as part of a project initially planned as a larger laboratory-based study, which was interrupted and altered due to the 2019 outbreak of the coronavirus pandemic. A brief write-up of the preliminary study can be found in Appendix 1. In the present paper, the preliminary study mainly serves to develop the methodology of our prospective study and to establish its feasibility. In short, we tested a comparison focus manipulation among a sample of 60 students with elevated levels of social anxiety. The analyses showed no group differences in similarity ratings, affect, or speech performance ratings. Temporal distance ratings were not affected by group, suggesting that the experimental manipulation was not potent enough; therefore, we have made several adjustments to the experimental protocol. The current proposed design differs in several important aspects as described below.

Proposed Study Design

Building on our preliminary study, we thoroughly refined the instructions for the manipulation and the assessment to further emphasize the comparison focus on differences or similarities. We additionally incorporate a spatial timeline manipulation as described by Wilson et al. (2009) in order to combine the difference-focus condition with an emphasis on temporal distance, and the similarities-focus with an emphasis on temporal proximity. We also refined the temporal discrimination task instructions to enhance the specificity of differences or similarities with past negative attributes. This is to reduce abstraction of the concept of the past self, i.e., high-level construal, because this may unintentionally increase psychological distance (Trope & Liberman, 2010). Next to perceived similarity with the aversive past self and current negative affect, we will assess current and past fear of negative evaluation (FNE) as a key dependent variable relevant to social anxiety. This research protocol is a 2(comparison focus: differences, similarities) x 3(time: baseline, post-

1 manipulation, post-speech)~~2x3~~ mixed design (~~Comparison focus x Time~~), where participant
 2 allocation to the comparison focus conditions (differences or similarities group) is
 3 randomized and double-blinded, while time refers to measures at baseline (T1), post-
 4 manipulation (T2) and post-speech task (T3).

5 **Proposed Sample Characteristics**

6 Participants (N=160) will be students recruited from nearby faculties and further
 7 education institutions who complete the online self-screening and meet the inclusion and
 8 exclusion criteria. Candidates will be eligible if they are within the first two semesters of their
 9 bachelor's degree and under the age of 21, so that they can recall an aversive memory from
 10 the last three years of high school. Specifically, the inclusion criteria will be: a) reporting
 11 elevated, but not severe, symptoms of social anxiety measured by a score of at least between
 12 20 (i.e., cutoff for endorsing at least some social anxiety symptoms; Klumpp & Amir, 2010)
 13 and 59 (indicating probable social anxiety disorder) on the self-report Liebowitz Social
 14 Anxiety Scale (LSAS-SR; Consbruch et al., 2016; Liebowitz, 1987); b) aged between 18 and
 15 21 years, c) having completed their high school diploma within ~~in~~ the last four years; d)
 16 currently in the first four semesters of their studies; d) native-level German language
 17 proficiency. Exclusion criteria will be: a) current psychiatric-mental disorder; b) scores above
 18 20 on the depression subscale of the Depression Anxiety Stress Scales, indicating severe or
 19 extreme depression symptoms (DASS; Lovibond & Lovibond, 1995); c) psychotherapeutic or
 20 psychiatric treatment in the last two years; ~~ed~~ current psychotropic medication; ~~de~~
 21 consumption of alcohol > 15 units per week; ~~ef~~ recreational drug use > 1 unit per week. The
 22 inclusion and exclusion criteria questions will be based on self-report and participants will be
 23 informed of their eligibility after completing the online screening. Participants who are
 24 excluded based on extreme LSAS or DASS-D scores will be informed that they may fulfill

criteria for respective social anxiety or depression disorders, and that mental health care services are available to them through the day care clinic at our university.

Experimental Protocol

As in the preliminary study (see Appendix 1), experimental sessions will consist of three parts: baseline measurements (T1), comparison focus manipulation followed by post-manipulation measurements (T2), and the speech task followed by post-speech measurements (T3). T1 will consist of measures of depression, ~~positive and~~ negative affect, memory selection with keyword allocation, and visual analogue ratings of discomfort of the memory and perceived similarity with the past self. Participants will select an idiosyncratic aversive memory to serve as a temporal comparison standard throughout the experiment. They will be instructed to recall and select a negative memory from the past three years of high school in which they strongly felt embarrassment, humiliation, or shame in a social situation, and may have experienced criticism or disinterest from others, been self-conscious about their appearance, or experienced physical symptoms of anxiety, e.g. sweating, trembling, blushing, increased heart rate (for the full instructions, see Appendix 2). Participants will then label each memory by providing a keyword for later recall. Each prompt or reference to the memory will be accompanied by this memory keyword, indicated by *memory* here in the methods and instructions in the appendices.

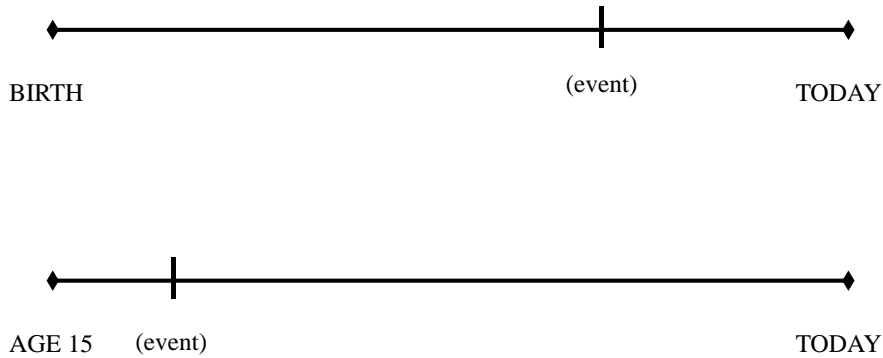
The experimental manipulation will consist of a combination of four interventions serving to either enhance or decrease perceived temporal closeness of the aversive memory. First, we will employ the focus priming task from Hanko et al. (2009), where participants will be presented with three pairs of pictures and prompted to list three differences or similarities for each pair, identical to the preliminary study. Second, this will be followed by instructions to describe the memory, whereby the instructions will emphasize temporal perspectives, for example for differences: “*think back to the event*”; whereas for similarities: “*think of the*

recent memory”. Full instructions are found in Appendix 3. Third, we will afterwards include an additional timeline scale to manipulate perceived temporal distance as per Wilson et al. (2009), with instructions also emphasizing temporal distance or closeness for the differences or similarities group, respectively. For differences, “*Please mark on the line below the extent of time that has passed since the event occurred*”, whereas the similarities condition will read “*...below how close in time the event feels to the present.*” Beginning anchors will be defined as “*Birth*” or “*15 years old*” for the differences/similarities group respectively (Figure 1). While Wilson et al. (2009) used the anchor of 16 years, we use 15 years as the recalled event will be in the last three years of high school. Full instructions can be found in Appendix 4. Fourth and finally, the temporal discrimination task that follows will also emphasize specific temporal differences or similarities. Participants will be instructed to list specific negative personal differences/similarities with their past self, and instructions will seek to emphasize temporal contrast/assimilation with the past self, respectively. For example, for differences: “*Picture how you were in the event*” and “*Please list three things that have improved since then*”; whereas for similarities: “*Picture yourself in the event*” and “*Please list three things that have not improved since then*”. Full instructions can be found in Appendix 5. Post-manipulation measures comprise of ~~positive and~~ negative affect, perceived similarity with the past self, and psychological distance ratings of the past self.

At T3, the speech task will be administered. The same protocol as in the preliminary study will be used, with one exception: After being informed of the speech task, participants will be asked to rate their current fear of evaluation for the impending task. After the task, participants will rate speech task performance, ~~positive and~~ negative affect, perceived fear of negative evaluation of the past self, and perceived similarity with the past self. Instructions for the current and past fear of negative evaluation measures can be found in Appendix 6.

Figure 1

1 *Spatiotemporal manipulation of perceived distance to the memory event.*



2

3 Note. Participants are asked to mark the recalled event on the timeline. Instructions differ
 4 slightly per group to emphasize temporal distance or closeness. The Birth-Today timeline
 5 makes the event appear more recent than the Age 15-Today timeline. Instructions are in
 6 Appendix 4.

7 **Table 2**

8 *Operationalization and measurement of relevant constructs*

Construct	Operationalization and measurement
Manipulated visuo-temporal distance	Marking the past event on the manipulated timeline as per Figure 1.
Perceived temporal distance	Measured as psychological distance to the past self using the Distancing subscale of the Memory Experiences Questionnaire.
Perceived similarity with the past self	Measured using visual analogue scales across three timepoints of the study.
Self-appraisals of social anxiety as the dimension of comparison between the past and current self	Social anxiety will be operationalized as Fear of Negative Evaluation (FNE). We will assess current anticipatory FNE prior to the speech task and perceptions of FNE for the recalled past self.
Affective reactions to temporal comparisons	We will assess negative affect at three timepoints in the study.
Behavioural reactions to anxiety providing situation post-manipulation.	Behavioural performance on a socially stressful speech task will be assessed using a rating scale for public speaking. Ratings by the participants will provide self-appraisals of performance, while ratings from blinded experimenters will provide external performance ratings. Speech length will also be recorded.

9

1 Assessment of Variables

2 *Psychological Distance and Similarity Ratings*

3 For our second manipulation check (MC2) we assess psychological distance to the
 4 negative memory with the Distancing subscale of the Memory Experiences Questionnaire
 5 (MEQ; Sutin & Robins, 2007) after the temporal discrimination task. The MEQ assesses ten
 6 facets of autobiographical memories and the associated phenomenology, one of which is the
 7 psychological distance people perceive with a given memory. The MEQ distancing subscale
 8 comprises 6 items (e.g., “*I feel like the person in this memory is a different person than who I*
 9 *am today*”) and are measured on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to
 10 5 (*strongly agree*). High mean values on this scale indicate a high subjective distance to the
 11 former self. As no German version is published the six items were translated into German and
 12 reverse-translated to English to ascertain accurate interpretation (Appendix 7). Internal
 13 consistency was excellent in the preliminary study ($\alpha = 0.90$).

14 Perceived similarity with the past self will be assessed with visual analogue scales
 15 (VAS) at T1, T2, and T3. Participants will be asked to indicate the extent to which they feel
 16 similar to their past self from memory ‘x’; responses will be measured using a scale anchored
 17 with ‘*not at all similar*’ to ‘*extremely similar*’.

18 *Fear of Negative Evaluation*

19 We will assess fear of negative evaluation at two timepoints in the study, representing
 20 state social anxiety (prior to the impending speech task) and perceived past-self social
 21 anxiety, measured at T3. We will use the German version of the Brief Fear of Negative
 22 Evaluation Scale (BFNE; Leary, 1983; Wieser et al., 2009), which is a shortened 12-item
 23 version of the Fear of Negative Evaluation Scale (Watson & Friend, 1969). The scale has
 24 been found to reliably predict social anxiety and experiential avoidance (Kampmann et al.,
 25 2018) by asking participants to what degree statements are characteristic of them (e.g., “*I am*

usually worried about what kind of impression I make”). The FNE instructions will be adjusted to refer to current anticipation of the speech task, i.e., state FNE, while instructions at post-speech will refer to the self in the memory event using past tense, i.e., past FNE (Appendix 5). The brief FNE scale has good psychometric properties with good internal consistency (0.88-0.96; Wieser et al., 2009). Our instructions in context of past memories have not been validated. Importantly, we do not use them for diagnostic purposes but rather to assess the assimilation or contrast effects of the manipulation (i.e., the difference between current- and past-self ratings of FNE in relation to socially stressful situations).

Aversive Memory Characteristics

At baseline, we ask how unpleasant the participants rate the memory using a visual analogue scale from 0 (*not at all*) to 100 (*extremely*). All ratings that fall below two standard deviations from the sample mean will be further reviewed. An experimenter will review the memory recall descriptions. This will enable us to screen for events that do not adequately reflect a negative social experience, i.e., do not include feelings of embarrassment, humiliation or shame. Participants reporting lack of such feelings will be excluded from the analysis.

Impromptu Speech Task

The speech task acts as an anxiety-provoking situation to assess differences between the conditions for behavioural performance evaluation, in line with previously established protocols (Edwards et al., 2003; Kampmann et al., 2016). Participants are asked to give a speech lasting five minutes that would be recorded on camera and later rated by two experimenters in the research group. They are given a choice of five topics (windfarm power, artificial intelligence, inheritance tax, mandatory organ donation, assisted suicide) and have two minutes to prepare the speech, during which they were allowed to make notes, but are not allowed to use them during the speech. Participants are recorded for the five-minute duration

or until they indicated that they wanted to stop. Participants are given a sign to hold up if they decide to stop before the five minutes, at which point the experimenter informs them that they still have time and ask if they have something else to add. If the participant declines or holds up the stop sign a second time before the task ends, the experimenter ends the recording and the task.

Speech length and performance evaluation are the variables used to assess group differences in the speech task. Participants, as well as two experimenters (blind to condition), rate the speech performance using the public speaking performance measure from Rapee and Lim (1992). This consists of 17 items rated on a 5- point Likert scale (*not at all* to *very much*), assessing favourable (e.g., *had a clear voice*) and unfavourable (e.g., *sweated* or *blushed*) behaviours and reactions. Higher scores on this measure indicate better speech performance. The internal consistency in the preliminary study was acceptable for participants ($\alpha = 0.77$). As speech length will have ceiling effects due to the five-minute time limit, we will dichotomize the data into binary values for participants who completed the five minutes and those who finished early. We use this data for descriptive purposes of group differences.

The video recordings will be used solely for two coders to rate the quality of performance on the public speaking performance measure. Inter-rater reliability will be calculated for the two independent ratings based on an absolute-agreement 2-way mixed-effects model. In the preliminary study (Appendix 1), this showed excellent agreement with intraclass correlation coefficient estimates of 0.95 (95% CI: 0.94, 0.96). Scores will be averaged between the two raters when inter-rater reliability is at least good, i.e., estimates above 0.60.

Affective Responses

Negative affect is assessed three times over the course of the experiment using the German version of the Positive and Negative Affect Schedule (PANAS; Breyer & Bluemke, 2016; Watson et al., 1988). The PANAS consists of a list of ten positive (e.g. *proud, interested*; $\alpha > 0.74$) and ten negative (e.g. *distressed, ashamed*; $\alpha > 0.80$) dimensions of state affect. Participants rate the intensity of feeling for each adjective on a Likert scale of 1 (*not at all*) to 5 (*extremely*). As per hypothesis 3, data analysis will only assess the negative subscale of the PANAS.

Baseline Depression

~~Depression is assessed using the subscale from the German Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995; Nilges & Essau, 2015), which assesses dysphoria, hopelessness, anhedonia, and inertia. Participants rated the 14 items of the depression subscale (DASS-D) to indicate the extent to which statements applied to them during the past week on a scale of 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Depression scores based on the DASS-D averaged 8.88 ($SD = 5.68$) ranging from 0 to 24, showing good internal consistency in the preliminary study ($\alpha = 0.86$).~~

Screening of Social Anxiety

The German self-report version of the Liebowitz Social Anxiety Scale (LSAS-SR; Consbruch et al., 2016) assesses fear and avoidance in social situations. Each of the 24 items is rated on a 4-point Likert scale with higher scores indicating higher levels of social anxiety. In the preliminary study, average LSAS-SR scores were 50.37 ($SD = 18.99$; range: 20 to 122), showing excellent internal consistency ($\alpha = 0.93$).

Screening Depression

Depression is assessed using the subscale from the German Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995; Nilges & Essau, 2015), which assesses dysphoria,

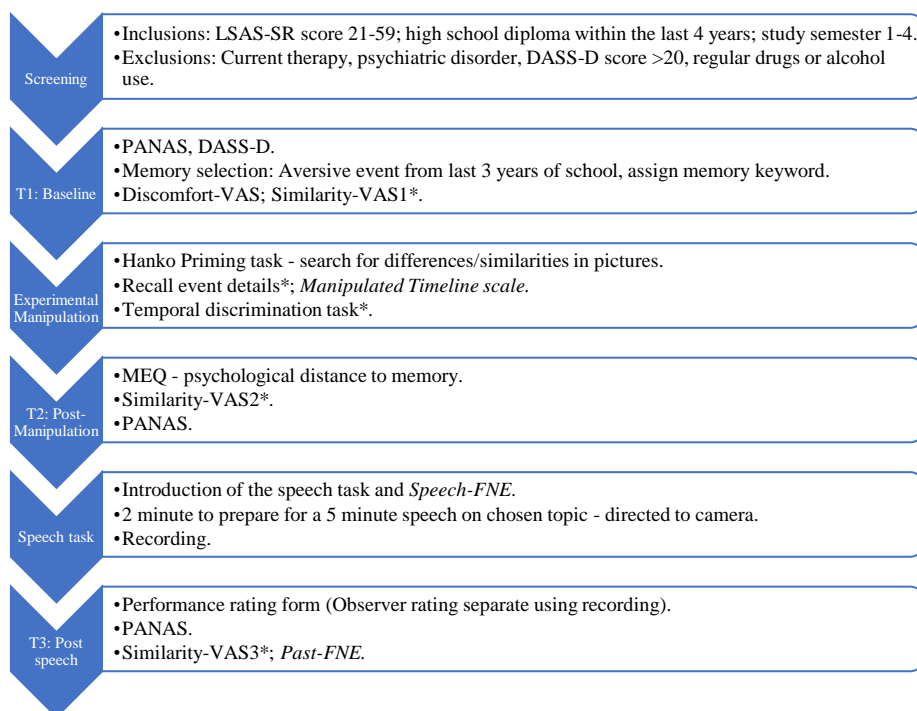
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hopelessness, anhedonia, and inertia. Participants rate the 14 items of the depression subscale (DASS-D) to indicate the extent to which statements applied to them during the past week on a scale of 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Depression scores based on the DASS-D averaged 8.88 ($SD = 5.68$) ranging from 0 to 24, showing good internal consistency in the preliminary study ($\alpha = 0.86$).

Procedure

Figure 2

Current study protocol for the current proposed study.



Note. PANAS = Positive and negative affect scale; VAS = visual analogue scale.

*Wording/form adjusted from preliminary study; italics indicate new measures.

1 Sampling Plan

2 Except for the medium interaction effect size reported by Hanks et al. (2009; Study 1)
 3 for an interaction involving a similarity focus manipulation ($\eta^2_p=.07$), there are no similar
 4 studies directly manipulating comparison focus in context of aversive memories and/or that
 5 closely match our experimental conditions. Moreover, the above-mentioned effect size cannot
 6 directly be translated to the present study due to different outcome variables and the
 7 availability of baseline assessments for most analyses, which may enhance precision. For our
 8 2 (comparison focus: similarities, differences) \times 3 (time: baseline, post-manipulation, post-
 9 speech) experimental design, we simulated ANOVAs with a hypothesized experimental group
 10 effect size of approximately $d = 0.50$ from baseline to post-manipulation, and a slightly
 11 reduced group effect size of approximately $d = 0.45$ from baseline to post-speech, whereby
 12 repeated measures were correlated with $r = .50$. The sample size was set at $n = 80$ per group,
 13 resulting in a total sample of $N = 160$. Using the ‘superpower’ package in R, we conducted
 14 simulations with 1000 iterations to evaluate the statistical power with alpha set at 0.05. For
 15 the comparison focus \times time interaction in the overall ANOVA, we determined a power of
 16 86.4% (95% CI = [84.1, 88.4%]). The power to detect significant group effects in the contrast
 17 from baseline to post-manipulation was estimated at 89.2% (95% CI = [87.3, 91.1%]), and
 18 for the contrast from baseline to post-speech it was 80.3% (95% CI = [77.8, 82.5%]).

19 To assess statistical power of the MANOVA, we conducted a Monte Carlo simulation-
 20 based power analysis with two dependent variables: self-rated and experimenter-rated speech
 21 performance. We assumed a moderate correlation ($r = .30$) between these dependent
 22 variables. We then evaluated two scenarios. First, we expected relatively uniform moderate
 23 effect sizes ($d = 0.50$ and $d = 0.45$). With 80 participants per group, power was estimated at
 24 92.9% (95% CI = [91.2%, 94.5%]). Second, we evaluated a scenario where one effect is
 25 medium-sized ($d = 0.50$) and the other small ($d = 0.20$). Here power was estimated at 82.2%

(95% CI = [79.9%, 84.4%]). The R code for our power calculations can be found on the project's Open Science Framework folder [<https://osf.io/39uwb>].

Data Collection

Participants will be invited to the online screening via a link provided on flyers and online adverts. The screening will be implemented on the Unipark survey platform. Individuals matching the inclusion and exclusion criteria will be invited to make an appointment in the study calendar. Participants will be asked to provide a memorable personal codeword following the online screening using a codeword protocol, which will be used to identify their data entries in password-protected files. Recorded video data files will also be stored as password-protected, identified only with the codeword. All participants would be required to give informed consent at the start of the study and provide signed confirmation at the end of the study. At the lab appointment participants will complete data collection on a computer online via the Unipark survey website, where data will be electronically stored. If a participant decides to withdraw consent after the study, all data entries can be identified using the codeword and deleted.

Missing and Outlier Data

Participants will complete data collection on a computer online via the Unipark survey website, with each question or input set to forced-answer to avoid participants skipping or missing questions. Participants who leave the experiment early will be considered to have withdrawn consent; thus, their data will be excluded from data analysis.

Outliers will be identified as values of $\pm 2.5SD$ from the mean for all outcome variables. We will employ Winsorizing and replace data points with the sample mean $\pm 2.5SD$ prior to the analyses (Rivest, 1994).

1 **Funding and Ethical Approval**

2 Ethical approval for the preliminary study was provided by the research ethics
3 committee of the university psychology faculty (application 2019-29-PMC) and an
4 amendment to accommodate differences in the new study will be sought. Participants will
5 receive either 8€ financial compensation or hourly credit as a part of their studies, funded by
6 the work unit Clinical Psychology, Psychotherapy, and Health Psychology at the Institute of
7 Psychology, University of Münster. No other external funding is involved.

8 **Analysis Plan**

9 The main hypotheses will be tested by means of repeated measures ANOVAs and a
10 MANOVA using the ‘afex’ package (Singmann et al., 2012) in the latest stable release of R
11 (R Core Team, 2024) available at the time of analysis, assuming equivalent features are
12 present as in the current version (4.4.2). To test the assumption of normal distribution we
13 shall use the Shapiro-Wilks W test, as well as limit the range of skewness (± 2) and Kurtosis
14 values (± 7). In cases of violations of normality, we will use base 10 log transformations prior
15 to computing arithmetic means of the dependent variables for statistical analysis and report
16 the geometric means. Alpha is set at .05 (two-tailed) for all tests.

17 Frequentist statistical analyses will be complemented with Bayes factors (BF)
18 computed in R. We will use default priors for the analyses. BF represent the ratio of
19 likelihood for one hypothesis to that of another hypothesis, such that BF10 indicates the
20 likelihood of the alternative hypothesis (H1) over the null hypothesis (H0) based on the data,
21 while the prior assumption was that H1 and H0 are equally likely, whereas BF01 indicates the
22 likelihood of H0 over H1. For repeated measures ANOVAs group main effects will be tested
23 against H0 with participants and time as predictors. Interaction effects are tested against
24 models including the respective main effects. Evidence is conventionally considered
25 “anecdotal” with BFs > 1 , “moderate” with BF > 3 , “strong” with BF > 10 , and “very strong”

with $BF > 30$. Either BF_{10} or BF_{01} will be reported, whichever is greater than 1. The raw dataset will be publicly shared via the Open Science Framework.

Appendices

Appendix 1: Preliminary study

Overview and Design

We recruited 60 participants (56 women, 4 men; age $M = 19.6$, $SD = 0.99$) in 2019 and 2020. Inclusion/exclusion criteria (based on self-report screening) were: university students, reporting at least subclinical levels of social anxiety, having graduated from high school in the last four years, and not reporting any psychological disorders or elevated consumption of alcohol/recreational drugs. Half of the participants completed the study in the laboratory (i.e., before the 2020 Covid restrictions) and half in an online format. In both settings, half of participants were randomly assigned either to a *differences* or a *similarities* condition in a double-blind manner. Participants in the lab completed all questions and scales using paper and pencil, while participants online took part in a video call via Zoom with an experimenter who provided links to all questions and scales online via the Unipark survey tool. The protocol and measures included at the screening and each stage of the experiment are depicted in Figure A1.

Procedure and Dependent Variables

Experimental sessions consisted of three parts: baseline, comparison focus manipulation, and speech task. Dependent variables were the Positive and Negative Affect Schedule, PANAS; Breyer & Bluemke, 2016), perceived spatiotemporal distance of the aversive memory on a timeline (i.e., on a visual analogue timeline ranging from 0 = *birth* to 100 = *today*; estimations closer to birth indicate greater perceived distance), ratings of behavioural similarity with the past self on a visual analogue scale (VAS; 0 to 100),

psychological distance (distancing subscale of the Memory Experiences Questionnaire, MEQ; Sutin & Robins, 2007), and speech performance ratings.

Aversive Memory Task

Participants selected an idiosyncratic aversive memory, serving as a temporal comparison standard throughout the session, whereby the experimental manipulation aimed at highlighting differences or similarities with the standard. Specifically, participants were instructed to recall and select a memory from the last three years of high school in which they felt embarrassment, humiliation, or shame in a social situation. Participants then selected a keyword associated with the memory to recall it later, rated the discomfort of the memory (visual analogue scale from 0=*not at all* to 100=*extremely*; $M=79.40$; $SD=20.33$) and the similarity of their experience to themselves today (visual analogue scale from 0=*not at all* to 100=*completely*; $M=44.39$; $SD=24.29$).

Experimental Manipulation

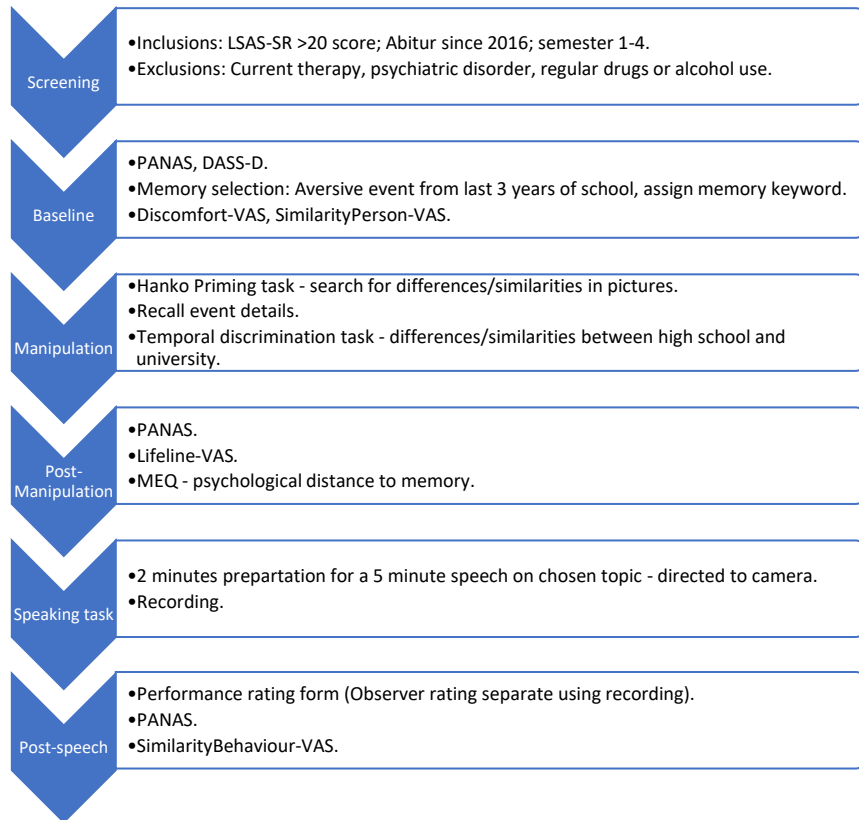
We used an adapted version of the focus priming task by Hanko et al. (2009). Participants were presented with three pairs of pictures and prompted to list three differences or similarities for each pair, depending on which condition they were allocated to. Afterwards, participants were prompted to recall the memory they selected (whilst showing the associated keyword) and describe it in detail (where, who, thoughts, feelings). This was followed by a temporal discrimination task, where participants were asked to list three differences or similarities (depending on their condition) between their experiences at school and university. After the manipulation participants rated the recalled event on a timeline, then completed the PANAS and MEQ-distancing measures.

Speech Task

Participants were then informed they would perform an impromptu speech to be recorded and later evaluated. They chose a topic from five possibilities, were given a preparation period of two minutes, before being instructed to present for 5 minutes without using any written notes. At post-speech we assessed self-appraisal of performance, the PANAS, and perceived similarity of the speech situation with the aversive past self. Speeches in the laboratory were recorded via camcorder, while online recordings were made within the Zoom call, which were later rated independently by two experimenters blinded to condition and scores were averaged

Figure A1.

1 *Preliminary Study protocol*



2

3 *Results*

4 Data were analysed using version 0.17.3 of JASP with default priors in all analyses
 5 (JASP Team, 2023). The data of the preliminary study is accessible via the OSF page.

6 Table A1 depicts the means, standard deviations, relevant group comparison statistics
 7 at post-manipulation and post-speech for our dependent variables. No differences were found
 8 between the groups in ratings of similarity, temporal distance on the timeline and the MEQ,
 9 in positive and negative affect, as well as speech performance ratings (e.g., speech length,

$U=536.5, p=.192$). BFs suggested mostly inconclusive evidence, with largely anecdotal support for the null hypotheses.

Table A1

Preliminary study: Group means and differences

	Comparison focus		<i>F</i> or <i>t</i> (<i>df</i>)	<i>p</i>	<i>BF₀₁</i>
	Differences <i>M</i> (<i>SD</i>)	Similarities <i>M</i> (<i>SD</i>)			
Post-manipulation					
PANAS-PA (group x time, T1-T2)	26.53 (6.64)	25.8 (5.85)	0.45 (1,57)	.507	3.14
PANAS-NA (group x time, T1-T2)	16.3 (6.79)	17.20 (4.39)	1.07 (1,57)	.306	2.50
Lifeline-VAS	73.24 (18.81)	75.57 (12.54)	-0.57 (58)	.573	3.33
MEQ-distance	2.81 (0.97)	2.70 (0.85)	0.45 (58)	.655	3.50
Post-speech					
PANAS-PA (group x time, T2-T3)	25.3 (5.35)	24.83 (6.79)	0.04 (1,57)	.838	3.67
PANAS-NA (group x time, T2-T3)	18.93 (7.39)	20.77 (5.97)	0.29 (1,57)	.590	2.62
SimilarityBehaviour-VAS	37.27 (31.83)	46.64 (27.80)	-1.22 (58)	.229	2.05
Performance self-evaluation	38.70 (6.91)	35.20 (8.31)	1.77 (58)	.081	1.03
Performance observer-evaluation	56.58 (4.02)	58.27 (3.94)	-1.64 (58)	.107	1.25

Note. MEQ = Memory Experiences Questionnaire; PANAS-NA/PA = Positive and Negative Affect Schedule – Negative Affect / Positive Affect (PANAS-NA ANOVAs use log10 corrected scores, while geometric means are reported); T1 = baseline; T2 = post-manipulation; T3 = post-speech; VAS = Visual analogue scale.

Appendix 2: Memory selection instructions

“We would now like you to think of a negative memory that you should remember in more detail later on in the study. Please try to remember an event from the last three years of your school career in which you felt embarrassed, humiliated, or ashamed in a social situation. It could be a situation in which you found yourself among friends, family members or strangers or a public appearance, e.g. a presentation. You may have experienced criticism or disinterest from others, been self-conscious about your appearance or experienced physical

symptoms of anxiety (e.g. sweating, trembling, blushing, increased heart rate). Take a moment to choose a negative memory that is clear in your mind. If you think of several events, please select only one. Once you have selected a situation, please enter a keyword associated with the memory to help you remember it later.”

Appendix 3: Memory description instructions

Differences:

“We would like you to think back to the event (*memory*) all those years ago to try and recall some details about your previous self. Please explain in several paragraphs where your past self was, who else was present, how your past self behaved and how they thought and felt.”

Similarities:

“We would like you to think of the recent memory you named (*memory*). Please explain in several paragraphs and imagine where you are, visualize who else is present, how you are behaving, what thoughts are possibly going through your mind, and what feelings you are experiencing.”

Appendix 4: Temporal lifeline instructions

Differences:

“Please mark on the line below the extent of time that has passed since the event occurred.”

Similarities:

“Please mark on the line below how close in time the event feels to the present.”

Appendix 5: Temporal discrimination task instructions

Differences:

“Picture how you were in the event of your memory (*memory*) and the negative characteristics you had. Think about what kind of person you were in the event, what

characterized you, how you felt, thought, and behaved. Please list three things that have changed since then, considering how you feel, think, and behave today, compared to how you did back then in the memory.”

Similarities:

“Picture *yourself* in the event of your memory (*memory*) and the negative characteristics *you have*. Think about what kind of person *you are* in the event, what *characterizes* you, how you *feel, think, and behave*. Please list three things that have not changed since then, considering how you feel, think and behave today when considering your experiences of this memory.”

Appendix 6: Brief Fear of Negative Evaluation Scale instructions.

Current FNE:

Regarding the presentation you are about to give, read each of the following statements carefully and indicate how characteristic it is of you according to the following scale:

1 = Not at all characteristic of me, 2 = Slightly characteristic of me, 3 = Moderately characteristic of me, 4 = Very characteristic of me, 5 = Extremely characteristic of me

Items:

1. I worry about what other people will think of me even when I know it doesn't make any difference.

2. I am unconcerned even if I know people will form an unfavourable impression of me.

3. I am afraid of people noticing my shortcomings.

4. I do not worry about what kind of impression I will make on someone.

5. I am afraid that others will not approve of me.

6. I am afraid that people will find fault with me.

7. Other people's opinions of me do not bother me.

8. When I am talking, I will worry about what others may be thinking about me.

9. I am worried about what kind of impression I will make.

10. If I know someone is judging me, it has little effect on me.

11. I think I will get too concerned with what other people think of me.

12. I worry that I will say or do the wrong things.

Past-self FNE:

Read each of the following statements carefully and indicate how characteristic it was of you in the event *memory* according to the following scale:

1 = Was not at all characteristic of me 2 = Was slightly characteristic of me 3 = Was moderately characteristic of me 4 = Was very characteristic of me 5 = Was extremely characteristic of me

1. I worried about what other people thought of me even when I knew it didn't make any difference.

2. I was unconcerned even if I knew people were forming an unfavourable impression of me.

3. I was frequently afraid of other people noticing my shortcomings.

4. I rarely worried about what kind of impression I was making on someone.

5. I was afraid others would not approve of me.

6. I was afraid that people would find fault with me.

7. Other people's opinions of me did not bother me.

8. When I was talking to someone, I worried about what they may have been thinking about me.

9. I was usually worried about what kind of impression I made.

10. If I knew someone was judging me, it had little effect on me.

11. Sometimes I thought I was too concerned with what other people thought of me.

12. I often worried that I would say or do the wrong things.

Appendix 7: Memory Experience Questionnaire German Instructions

1. Ich habe nicht viel mit der Person aus der Erinnerung gemeinsam.

2. Ich habe das Gefühl, die Person in dieser Erinnerung ist eine andere Person, als ich es heute bin.

3. Wenn ich an die Erinnerung zurückdenke, denke ich: „Das bin nicht mehr ich.“

4. Mein Verhalten in dieser Erinnerung steht im Einklang mit meiner Persönlichkeit.

5. Ich habe das Gefühl, dass ich heute dieselbe Person bin wie in der Erinnerung.

6. Diese Erinnerung steht im Einklang mit dem, wer ich heute zu sein glaube.

Funding

The authors declare that they have received no specific funding for this study,

Conflict of interest

The authors declare that they comply with the PCI rule of having no financial conflicts of interest in relation to the content of the article. The authors declare the following non-financial conflict of interest: One author is a recommender for PCI-RR.

Data, scripts, code, and supplementary information availability

Power analysis R code: <https://osf.io/39uwb>

Preliminary data available online: <https://osf.io/ag4vj>

SPSS Syntax for processing preliminary data: <https://osf.io/u2t8b>

SPSS Syntax for frequentist data analysis of preliminary data: <https://osf.io/7hs2k>

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