**Extended Method**

**Participants**

Undergraduate students (*n* = 133) between the ages of 18 and 32 (*Mage* = 19.97, *SD* = 1.66) participated in the study for course credit at a Midwestern university. Recruitment occurred online via the SONA Systems website (https://siuc.sona-systems.com; SONA Systems, Ltd., Tallinn, Estonia) during the 2021-2022 and 2022-2023 academic school years. Participants were primarily female (*n* = 85; 63.91%), followed my male (*n* = 43; 32.33%), and then nonbinary (*n* = 5; 3.76%). Most participants identified as White (*n* = 87; 65.41%), then Black (*n* = 34; 25.56%), then Latino (*n* = 18; 13.53%), then Asian (*n* = 3; 2.26%), then Pacific Islander (*n* = 2; 1.50%), then Native American (*n* = 1; 0.75%). Most of the sample identified as non-Hispanic (*n* = 114; 85.71%), over Hispanic (*n* = 19; 14.29%). Participant attrition was 14.46%, with 6.92% at T2 and 7.55% at T3. We reported how we determined our sample size, all data exclusions, all manipulations, and all measures in the study (Simmons et al., 2012). Some studies have demonstrated that undergraduates are an adequate sample for testing intervention studies (e.g., Gao, 2020; Onyper et al., 2012). Exclusion criteria are as follows: 1) below the age of 18, 2) no access to a computer or stable internet to complete the study on, and 3) not completing the entire study, 4) less than a high school diploma or equivalent or 5) English as a second language.

**Session Procedures**

The current investigation used a longitudinal design to test for predictive power and mediation. As such, there were three time points of data collection (see *Figure* 7).

**Time 1 (+0 Days).** At time one, we first presented the participants with an informed consent. Upon completion of the informed consent, participants were promoted to enter the last four digits of their Dawg Tag number, which we used to connect the participants data across the time points. First, participants completed the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), Positive and Negative Affective Schedule (PANAS Watson et al., 1988), and Ryff’s Psychological Well-Being Scale (RPWBS; Ryff, 1989; Kállay & Rus, 2014) in a counterbalanced order. Upon completing the baseline measures, the participants completed either the Best-Self PPI or the control intervention. The time one session took approximately 30 minutes to complete. Upon completion of time one, we awarded the participants course credit and told they will be debriefed upon completion of the entire study.

**Time 2 (+1 Day).** At time two, we first presented the participants with an informed consent. Upon completion of the informed consent, participants completed the PANAS (i.e., set for the previous day; Watson et al., 1988) and the Self-Referential Encoding Task (Dainer-Best et al., 2018). The time two session took approximately 20 minutes to complete. Upon completion of time two, we awarded the participants course credit and told they will be debriefed upon completion of the entire study.

**Time 3 (+8 Days).** At time three, we first presented the participants with an informed consent. Upon completion of the informed consent, participants completed the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), the Ryff’s Psychological Well-Being Scale (RPWBS; Ryff, 1989; Kállay & Rus, 2014), and the Positive and Negative Affective Schedule (PANAS; set to measure previous weeks affect; Watson et al., 1988) in a counterbalanced order with attention checks. Participants were removed if they failed more than one of the attention checks. Upon completion of time two, we awarded the participants course credit and debriefed them.

**Justification of Timing.** In longitudinal studies, researchers much justify the timing of the study sessions (Collins & Graham, 2002). Time two was set one day after time one for two reasons. First, the intervention likely needs time to bias self-referential processing. This break was hypothesized to weaken the memory of the adjectives the participants used to describe themselves in the Best-Self PPI to allow for a more accurate measure of self-referential processing bias. Second, part of the instructions of the Best-Self PPI involved the participants changing their behavior over a 24-hour period. Time three was set seven days after time two to be at least one full week from the intervention delivery. This time was needed to detect changes in depression using the CES-D (Radloff, 1977) and psychological well-being using the Ryff’s Psychological Well-being Scale (Ryff, 1989; Kállay & Rus, 2014; see *Figure* 8).

**Measures**

**Demographics Survey.** The demographic survey consisted of demographic information on the participants’ age, sex, gender, ethnicity, race, year in college, marital status, household income, personal income, highest educational attainment, and current work status (see Appendix A).

**Center for Epidemiologic Studies Depression Scale (CES-D).** W e used the Center for Epidemiologic Studies Depression Scale (CES-D) as a measure of depression over the last week (Radloff, 1977). Individuals respond to 20-items such as, “I felt that I could not shake off the blues even with help from my family or friends” on a 4-point scale ranging from 0 to 3 (0 = *rarely or none of the time (less than 1 day)*, 1 = *some or a little of the time (1-2 days)*, 2 = *occasionally or a moderate amount of time (3-4 days)*, 3 = *most or all of the time (5-7 days)*). The original development study did not examine the factor structure of the CES-D, however, according to a meta-analysis the CES-D contains multiple factors (e.g., somatic, depressed affect, positive affect, and interpersonal problems), however, in some rotations a general depression factor can be extracted with strong item loadings from all items (Shafer, 2005). This single-factor use of the CES-D is supported by in the internal consistency estimates which ranged from α = .85 to α = .90 across samples and is sensitive to change. The scale demonstrated excellent convergent (e.g., Bradburn Negative Affect: *r* = .60; interview rating of depression: *r* = .49) and divergent validity (e.g., interview rating of cooperation with others: *r* = -.03; interview rating of understanding: *r* = -.13). The internal consistency and factor structure in the current study was good, α = .91, Ω = .76, CFI = .982, TLI = .980, RMSEA = .043, *p* = .700.

**Ryff’s Psychological Well-Being Scale (RPWBS).** We used the Ryff’s Psychological Well-Being Scale (RPWBS) as a measure of psychological well-being (Ryff, 1989; Kállay & Rus, 2014). Individuals respond to 42-items such as, “I think it is important to have new experiences that challenge how you think about yourself and the world” over the last week on a Likert-type scale which ranged from 1 to 7 (1 = *strongly disagree,* 2 = *somewhat disagree*, 3 = *a little disagree*, 4 = *neither agree or disagree,* 5 = *a little agree*, 6 = *somewhat disagree*, 7 = *strongly agree*). The scale demonstrated several well-fitting factor structures; however, the best-fitting structures are the correlated 6-factor structure and the hierarchical structure with 6 lower-order factors and 1 higher-order factor. The hierarchical factor structure suggests that a total scale score can be used. The scale demonstrated excellent overall reliability of ω = .99 and is sensitive to change. The scale demonstrated excellent convergent validity (e.g., life satisfaction: *rs* = .38-.73; Rosenburg Self-Esteem Scale: *r* = .29-.62), however, the literature lacks demonstrations of divergent validity. The internal consistency and factor structure in the current study was good, α = .92, Ω = .72, CFI = 1.00, TLI = 1.00, RMSEA = .035, *p* = .994.

**Positive and Negative Affective Scales (PANAS).** We used the Positive and Negative Affective Schedule (PANAS) to measure positive and negative affectivity (Watson, et al., 1988). The PANAS is a 20-item Likert-type scale which ranges from 1 to 5 (1 = *very slightly or not at all,* 2 = *a little*, 3 = *moderately*, 4 = *quite a bit,* 5 = *extremely*). The results on an EFA suggest that the scale has two factors that are weakly correlated, one negative affect factor and one positive affect factor. The scale has demonstrated that excellent reliability for seven temporal instructions (e.g., this moment, today, or the past week); ranging from α = .84 to α = .90. The subscales demonstrated good convergent and divergent validity with the Beck Depression Inventory (i.e., NA: *r* = .58, PA: *r* = -.36), anxiety using the State-Trait Anxiety Scale (Spielberger, 1989; i.e., NA: *r* = .51, PA: *r* = -.35), and various symptoms of psychopathology using the Hopkins Symptoms Checklist (i.e., NA: *r* = .74, PA: *r* = -.29). However, the literature lacks demonstrations of divergent validity. The internal consistency and factor structure in the current study was good, PA; α = .87, Ω = .87, NA; α = .74, Ω = .74, CFI = .925, TLI = .916, RMSEA = .049, *p* = .201.

**Task**

**Self-Referential Encoding Task.** The self-referential encoding task is a behavioral task designed to measure biases in self-referential processing. The task in the current study was an adaptation of the task with parameters defined by Dainer-Best and colleagues (2018). The task was conducted on Qualtrics (Qualtrics LCC, Provo, UT, USA). The word stimuli were presented word by word in a random order (i.e., randomized for each participant). The participants used their mouse to select if the word either described them or did not describe them. There was 1,500 ms pause in between each word presentation. We then told the participants to take a break and relax for one minute. During this break we directed participants to watch a countdown clock. Upon completion of the break, the participants had five minutes to recall as many words as they could. The reason for the free recall is to simulate what happens when a participant recalls a past event. This memory assessment allows for a more accurate account of the words the participants use in recall, rather than initial identification. This method may help reduce any bias a person might have by the initial selection of the words (e.g., a person might say that dirty explains them, but during a free recall of events they do not use such a word to describe themselves; Dainer-Best et al., 2018). The task took approximately 15 minutes to complete.

**Task Scoring.** We calculated a *d*-score to standardize the valance measure of the task. We subtracted the number of positive words recalled for which the participants identify by the number of negative words recalled for which the participants identify. Then, we divided this score by the total number of words recalled for which for which the participants identify. The final score was a standardized measure of the valance of the participants’ self-referential processing. The scale ranges from -1, which means the recall was entirely negative, to 1, which means the recall was entirely positive. A score of 0 indicates that the recall was evenly positive and negative. One participant (*n* = 1) did not recall any words and they were removed from the analyses.

**Word Stimuli.** We selected word stimuli from the Affective Norms for English Words (ANEW) database which is a standardized database of words with valance, arousal, and frequency ratings completed by undergraduates (Bradley & Lang, 1999). The researchers selected 46 adjectives. The words significantly differed by valance ratings, *t*(44) = 28.58, *p* < .001, Cohen’s *d* = 8.43, and the difference was large between negative words (*M* = 2.44, *SD* = 0.61) and positive words (*M* = 7.45, *SD* = 0.58). The words did not significantly differ by arousal level, *p* = .727, with no difference between negative words (*M* = 5.33, *SD* = 1.10) and positive words (*M* = 5.44, *SD* = 1.03). The words did not significantly differ by frequency, *p* = .249, with no difference between negative words (*M* = 21.48, *SD* = 21.86) and positive words (*M* = 30.91, *SD* = 32.0). Finally, the words did not significantly differ by letter count, *p* = .106, with no difference between negative words (*M* = 6.30, *SD* = 2.25) and positive words (*M* = 7.30, *SD* = 1.87). We also included two neutral words at the beginning and ending of the list to control for primacy and recent effects (*Mvalence*= 5.06, *SD* = 0.63).

**Intervention and Control**

**The Best-self PPI.** The Best-self PPI is designed to encourage the participant to think about their good and strong character strengths from the past, present, and future in detail. We delivered the intervention in writing blocks, one for the past, present, and future. on the following pages, we have added the verbatim instructions that the participants saw for both the Best-Self PPI and the control activity. The sections are separated by page numbers indicating that we displayed the instructions to the participants in separate pages. Some instructions are a repetition of previous instructions:

**Page 1.**

Over your lifetime it is likely that you grow, develop, and change depending on your living situations and age. However, it is also likely that some of your strongest character strengths are consistent across your past and to the present. The following activity will help you identify the best parts of yourself.

Please identify a time/situation from high school or before where your character strengths and good qualities you like about yourself really shined through; a time where you used your character strengths and good qualities to help change your, or someone else’s, life. Use the following instructions to write your response.

Some examples you may use but are not limited to are creativity, curiosity, judgment and critical thinking, love of learning, perspective and wisdom, bravery, perseverance, honesty, zest and enthusiasm, love and being loving, kindness, social intelligence, teamwork, fairness, leadership, forgiveness, humility, prudence and carefulness about one's choices, and self-control.

a. You will write for at least five minutes.

b. Do not use specific names, as this may compromise your privacy.

c. You are free to write as many sentences as you want.

d. If you finish early, go back through, and re-read your response, and add more details.

**Page 2.**

Please identify a time/situation within the last 6 months where your character strengths and good qualities you like about yourself really shined through; a time where you used your character strengths and good qualities to help change your, or someone else’s, life. Use the following instructions to write your response.

Some examples you may use but are not limited to are creativity, curiosity, judgment and critical thinking, love of learning, perspective and wisdom, bravery, perseverance, honesty, zest and enthusiasm, love and being loving, kindness, social intelligence, teamwork, fairness, leadership, forgiveness, humility, prudence and carefulness about one's choices, and self-control.

a. You will write for at least five minutes.

b. Do not use specific names, as this may compromise your privacy.

c. You are free to write as many sentences as you want.

d. If you finish early, go back through and re-read your response, and add more details.

e. Failure to comply to these instructions will result in disqualification from the study.

**Page 3.**

Please discuss a time/situation in the future where you could use your character strengths and good qualities you like about yourself to help change your, or someone else’s, life. Use the following instructions to write your response.

Some examples you may use but are not limited to are creativity, curiosity, judgment and critical thinking, love of learning, perspective and wisdom, bravery, perseverance, honesty, zest and enthusiasm, love and being loving, kindness, social intelligence, teamwork, fairness, leadership, forgiveness, humility, prudence and carefulness about one's choices, and self-control.

a. You will write for at least five minutes.

b. Do not use specific names, as this may compromise your privacy.

c. You are free to write as many sentences as you want.

d. If you finish early, go back through and re-read your response, and add more details.

e. Failure to comply to these instructions will result in disqualification from the study.

**Page 4.**

Over the next day, I want you to pick one of the character strengths you demonstrated in your one of your stories you wrote about during today’s activity and use that character strength over the next day in a novel manner. For example, some people may have talked about how they are kind, and so they would so something nice for someone over the next day that they would not have done prior to this study, like buying a stranger a cup of coffee. You will be asked which character trait you chose and how you used it in a novel manner tomorrow.

**The control intervention.** The control task is designed to match the BS-PPI in as many ways as possible without focusing on character strengths, optimism, or coherence. As such, the

control task will be to write about a childhood memory, which is a common control condition in PPI studies (e.g., Seligman et al., 2005). The instructions are as followed:

**Page 1.**

Please identify a childhood memory of yours and write a 15-sentence summary of what happen. You are allowed to pick any childhood memory. Use the following instructions to write your response.

a. You will write at least 15 sentences.

b. You are allowed to use specific names, but this is not required.

c. You are free to write as many sentences as you want.

d. Failure to comply to these instructions will result in disqualification from the study.

e. You have 15 minutes to complete your response. If you finish early, please re-read your response and add more details until the time ends.

**Page 2.**

Over the next day we want you to think about this activity and how it relates to your life now. You will be asked about how you thought of your story tomorrow.

**Data Analytic Plan**

**Descriptive Analyses.** We conducted several psychometric analyses to describe the data. First, we report the descriptive statistics for all of the measures, including a Cronbach’s alpha for internal consistency. We then check for skewness and kurtosis to ensure that all the variables are appropriate for parametric analyses.

The researchers tested for the effects of the Best-Self PPI (BS-PPI) using SPSS 27.0 (IBM Corporation, LLC, Armonk, NY, 2020). To assess for changes in depressive symptoms and psychological well-being the researchers used a pre-post design and analyze the data using a 2 (Timing: Pre vs. Post) by 2 (Intervention: BS-PPI vs. Control) mixed Analysis of variance (ANOVA). We tested for simple effect, main effects, and interactions. To assess for changes in negative affect and positive affect the researchers used a 3 (Timing: Time 1 vs. Time 2 vs. Time 3) by 2 (Intervention: BS-PPI vs. Control) by 2 (Affect: Positive vs. Negative) mixed Analysis of Variance (ANOVA). The researchers tested for simple effects, main effects, and interactions. We used pairwise comparisons to test for simple effects using a Bonferroni correction to control for familywise error. Finally, we conducted an independent samples t-test to demonstrate differences ins self-referential processing bias due to the intervention.

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