

Duffy, Jessica ORCID logoORCID:

<https://orcid.org/0009-0004-8159-8776>, Cole, Scott ORCID

logoORCID: <https://orcid.org/0000-0001-8176-283X>, Charura,

Divine ORCID logoORCID: <https://orcid.org/0000-0002-3509-9392>

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Efficacy of the Best Possible Self intervention for generalised anxiety: exploration of mediators and moderators

J. Duffy, S. N. Cole, D. Charura and J. Shevchenko

School of Education, Language and Psychology, York St John University, York, UK

ABSTRACT

Generalised anxiety is increasingly prevalent, yet access to therapeutic interventions remains limited. We present two randomised control trials aimed to investigate the efficacy of the Best Possible Self (BPS) technique as an intervention for reducing anxiety in a non-clinical sample. The BPS was delivered online using survey software, and changes in anxiety were assessed over two weeks. Across both studies, the BPS significantly reduced anxiety, as measured with the *Generalised Anxiety Disorder-7 Questionnaire* (GAD-7). Evidence was found for the potential mediating role of self-esteem, and analysis of intervention frequency demonstrated that completing two or more sessions of the BPS intervention led to significant reductions in anxiety. Participants who completed only one session reported no significant change in symptoms. Evidence was not found for a moderating role of imagery capacity. These findings suggest that the BPS technique could be an accessible, cost-effective intervention for reducing generalised anxiety.

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Generalised anxiety; best possible self technique; self-esteem; mental imagery capacity

Introduction

Generalised anxiety is the most common anxiety-related concern reported by the general population and is associated to significant economic burden (Revicki et al., 2012). It is characterised by excessive and persistent worry and can be accompanied by physiological symptoms including sleep disturbances, restlessness, and muscle tension that can significantly impact an individual's quality of life (American Psychiatric Association, 2013; Chellappa & Aeschbach, 2022). The most common therapeutic intervention for generalised anxiety is cognitive behavioural therapy, which is recommended by the National Institute for Health and Care Excellence (NICE) guidelines for best practice (2020). However, despite the prevalence and severity of symptomology, treatments for generalised anxiety remain relatively inaccessible as mental health services struggle to meet the demand (Lattie et al., 2022; Revicki et al., 2012). Consequently, many individuals are left waiting for therapeutic intervention. Given the increasing demand for services, it is important to identify new, cost-effective interventions that can alleviate anxiety-related distress for individuals who are unable to access immediate support.

One promising intervention is the *Best Possible Self* (BPS) technique which is a positive psychological tool that requires individuals to mentally imagine and describe their ideal future (King, 2001). In the first BPS

experiment by King (2001), the effectiveness of the BPS technique was compared against a trauma writing exercise (writing about negative past experiences) and a control condition (writing about daily plans). Compared to the control condition, participants who wrote about their best possible self, once a day over four consecutive days, reported increased subjective well-being at a four week follow up. Participants in the trauma writing condition reported similar improvements, however the participants rated the task as more upsetting (as measured on a scale of 1–5) than the participants in the BPS condition. As such, the BPS was considered a better choice of intervention for vulnerable participants. Since then, the BPS technique has been used on various populations and has repeatedly delivered positive outcomes such as increased life satisfaction (Boehm et al., 2011), increased positive affect (Sheldon & Lyubomirsky, 2006), decreased depressive symptomology (Shapira & Mongrain, 2010), and decreased state-trait anxiety (Booth et al., 2024). The effects of the BPS technique on generalised anxiety symptomatology are less understood; however, preliminary findings suggest that it could be beneficial (Duffy et al., 2025). Duffy and colleagues assessed the immediate post-manipulation effects of the intervention and reported significant decreases in generalised anxiety. However, since Duffy and colleagues did not adopt a follow-up assessment, it remains unknown whether the effects of the BPS

CONTACT J. Shevchenko  j.shevchenko@yorksj.ac.uk  School of Education, Language and Psychology, York St John University, York YO31 7EX, UK

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technique would be present after a delay or if repeated use is required to maintain its benefits.

The present article presents two studies that explore the impact of the BPS technique on generalised anxiety symptomology across two-weeks. In addition to this, Study 1 also examined the mediating effect of self-esteem and the effects of incorporating a best past self-task, before the BPS technique. Following this, Study 2 compared the effects of varying frequencies of the BPS technique and explored the moderating effects of mental imagery capacity.

Study 1

Although previous research has investigated the factors that could moderate the effectiveness of the BPS technique, relatively little attention has been paid to mediating variables. Thus, questions concerning the underlying mechanisms that explain *why* the BPS technique is effective remain unanswered. We propose that the BPS technique could promote positive emotions (and potentially reduce anxiety) by boosting self-esteem. Specifically, vividly imagining positive mental images enables individuals to *pre-live* future events and experience how it would feel to inhabit that future state (Erikson, 2007). This immersive process can elicit emotional responses and can impact subjective feelings of self-worth (i.e. self-esteem) in the same way actual experiences can (Duffy et al., 2025). Broadly speaking, positive self-imagery is linked to high self-esteem and negative self-imagery to low self-esteem (Knox et al., 1998). Thus, since the BPS technique uses positive self-imagery, it could enhance self-esteem by encouraging individuals to pre-live a successful and fulfilling future (Owens & Patterson, 2013). This is particularly relevant because low self-esteem is a known predictor of anxiety symptomatology (Li et al., 2023). Therefore, it is possible that self-esteem could mediate the relationship between the BPS technique and anxiety reduction i.e. through enhancing self-esteem, positive future imagery could indirectly alleviate anxiety symptomology.

In addition to this mediation mechanism, Study 1 also explored the potential benefits of combining past- and future-focused tasks in the BPS technique. A past-self variant of the BPS technique has been employed previously by Carrillo et al. (2021). Carrillo and colleagues explored whether the temporality (past/present/future) of the BPS technique is necessary to produce positive effects or if individuals can experience the same benefits, as experienced when imagining their future-self, envisioning their best past-self or present-self. They found that regardless of temporality envisioning oneself in a positive way was enough to produce positive effects

(Carrillo et al., 2021). However, when envisioning the past, individuals are constrained by what has already occurred. Thus, if individuals have experienced significant trauma, they could find it difficult to generate positive past/present themes, therefore, the present study decided to focus on the future temporality. However, we did want to explore whether combining the past with the future could produce stronger effects than the standalone future intervention because previous research has demonstrated that imagining past success can boost self-efficacy (i.e. belief in one's abilities) and reduce psychological distress (Paersch et al., 2022). Moreover, higher self-efficacy is linked to stronger belief in the likelihood of positive future events (Brown et al., 2016). Thus, incorporating a best past self-task, before the future best possible self-task, could serve to boost self-efficacy in the present, in turn making positive future outcomes feel more credible. For example, an individual might visualise a best future self-involving graduating from university and landing their dream job. While this imagined scenario might have positive effects, the individual may doubt its likelihood. However, if the individual is instructed to reflect on their best past self, such as completing school with good grades and being accepted into university, it could make their envisioned future feel more achievable through boosting self-efficacy in the present. However, to our knowledge, the effect of combining the past and the future in the BPS technique are yet to be established.

Study 1 aimed to compare the effectiveness of the BPS for reducing generalised anxiety over two weeks in comparison to an activity writing and a passive control group. The Generalised Anxiety Disorder Questionnaire-7 (GAD-7) was employed to assess anxiety symptomology. The passive control group was included in the present article in addition to the activity writing task because research suggests that writing about daily activities could also be beneficial for well-being; thus, it might not be an adequate control group (Carrillo et al., 2021). Alongside investigating the effects of the BPS technique, Study 1 also aimed to fulfil two additional aims. First, to compare the effectiveness of the BPS technique to a condition that combined imagining their best past self with imagining their best future self (Best possible past-future self (BPP-FS)), to investigate if envisioning the past can boost the effects of the future-based task. The second additional aim was to assess the mediating role of self-esteem.

It was hypothesised that the BPS would significantly reduce anxiety over two weeks, consistent with cross sectional research (Duffy et al., 2025), but the participants in the control conditions would experience no significant change in symptomology. It was also

hypothesised that the BPP-FS condition would reduce anxiety significantly more than the standalone BPS. This hypothesis was made because the past can facilitate belief in one's capabilities which could make the future feel more possible (Paersch et al., 2022). Finally, it was hypothesised that the participants in the BPS and BPP-FS conditions would report a significant increase in self-esteem consistent with previous research (Owens & Patterson, 2013), and this change in self-esteem would significantly predict change in anxiety, since self-esteem is considered to be a contributor to symptomology (Li et al., 2023).

Methodology

Participants and study design

A minimal sample size of 84 was determined based on a priori power analysis conducted on G*Power. The inclusion criteria that were adopted for this study were as follows: (1) Aged over 18 (2) Fluent in English (3) UK resident (4) Not currently receiving psychological or pharmaceutical intervention.

A randomised control trial was employed with group assignment (BPS, BPP-FS, Activity Writing, Passive Control) representing the independent variable and anxiety scores (baseline vs follow-up) representing the dependent variable. Participants were recruited through an online research participation programme and social media. The participants who completed the study through the online research participation programme received points as partial fulfillment to a module requirement. All other participants received a £20 voucher for completing the study. All participants provided informed consent and ethics approval was granted from a university Ethics Committee.

Generalised anxiety was assessed within-subjects at baseline and after a 2-week delay. At baseline, 124 participants were randomly assigned to one of four groups: Best Possible Self [BPS], Activity Writing, Passive Control, Best Possible Past and Future Self [BPP-FS]. 26 participants were excluded from the analysis for not completing all elements of the study ($n = 23$) or for not following task instructions ($n = 3$).

A Chi-Square analysis showed the difference in retention rates across the conditions was not significant $\chi^2(3) = 2.12, p = .569, \phi = .12$. In addition, there was no significant difference between participants who dropped out and participants who completed the study on baseline anxiety scores ($Z = -.49, p = .622, 2$) and self-esteem $t(152) = 1.54, p = .063$.

In total 98 participants completed the study (86 female, 10 males, 2 non-binary, mean age = 20.92, $SD = 7.22$). There were no significant differences between groups in terms of self-esteem $F(3,93) = 1.18, p = .323$, baseline anxiety ($H(3) = .46, p = .928$), or age ($H(3) = 2.36, p = .501$).

Materials

All participants were informed that the study aimed to investigate individual differences in mood changes over two weeks. Participants in the control conditions received the same information, and as such had the same expectations regarding study outcomes.

Generalised Anxiety Disorder Questionnaire (GAD-7)

The Generalised Anxiety Disorder Questionnaire (GAD-7) (Spitzer et al., 2006) is a 7-item measure assessing generalised anxiety. Items are rated on 4-point scales (0 to 3; 0 = *not at all*, 3 = *nearly every day*). Scores range from 0–21. Greater scores indicate greater anxiety. The GAD-7 demonstrates good reliability and validity (Byrd-Bredbenner et al., 2020).

The Robson Self-concept Questionnaire (SCQ)

The Robson Self-concept Questionnaire (SCQ; Robson, 1989) is a 30-item measure assessing self-esteem (e.g. *'I can like myself even if others don't'*). Participants were asked to rate their self-esteem *over the last two weeks*. Items are rated on 8-point scales (0 to 7; 0 = *completely disagree*, 7 = *completely agree*). Greater scores indicate higher self-esteem. The questionnaire demonstrates good reliability and validity (Ghaderi, 2005).

Imagery training

Before completing their assigned tasks, all participants listened to an audio description of an imagery training exercise. The imagery training was adapted from previous research (Carrillo et al., 2021; Holmes et al., 2008) and involves participants imagining cutting into a lemon. Following this, participants received specific instructions for their respective condition.

Best Possible Self (BPS). In the Best Possible Self (BPS) condition, participants were asked to visualise and describe their best possible *future* self. Specifically, they were presented with the following instructions:

We would like you to mentally visualise, with as much detail as possible, your best possible self. Focus on your future, and imagine yourself and the qualities, skills, achievements, etc., that would form the best version of yourself and the best way in which your life could develop. Imagine that everything has gone in the way

you wanted. Take some time to imagine it. You can guide the construction of your best future self taking into account the following three areas: personal area (for example, feelings, physical abilities, personal achievements ...), academic or professional area (professional achievements, goals ...), social area (friendships, family relationships ...). To build your best possible self use as much sensory information as possible: smells, tastes, sights, sounds, feelings ... It will probably help you if you close your eyes and focus on what you visualise in your mind. Write down what you can see.

The participants responded by typing a description into a survey text box. The participants had to write a minimum of 30 words before completing the task.

Best Possible Past and Future Self (BPP-FS). In the BPP-FS condition, participants were asked to visualise and describe their best possible past-self before completing the BPS technique. Specifically, they were presented with the following instructions:

We would like you to mentally visualise, with as much detail as possible, your best past self. In order to do this, focus on your past and visualise yourself in the best time or moment where you consider that the best version of yourself appeared. Take some time to imagine it. You can guide the construction of your best past-self taking into account the following three areas: personal area (for example, feelings, physical abilities, personal achievements ...), academic or professional area (professional achievements, goals ...), social area (friendships, family relationships ...). To build your best past-self use as much sensory information as possible: smells, tastes, sights, sounds, feelings ... It will probably help you if you close your eyes and focus on what you visualise in your mind. Write down what you can see.

The participants responded by typing a description into a survey text box. After completing the past task, participants were presented with the BPS instructions as described above. The participants had to write a minimum of 30 words in both the past and future variant of the task.

Activity Writing. In the Activity Writing condition, participants were instructed to describe the activities they had engaged in earlier that day. Specifically, they were presented with the following instructions:

We would like you to visualise in your mind, with as much detail as possible, the activities you have done today. To do this, focus on the activities of your daily life that normally go unnoticed, such as meetings, classes, conversations, etc. This exercise consists of remembering them and visualising them in your mind as vividly as possible. To help you determine and guide what to focus on, think about an agenda of the last 24 h and review it slowly. Think about each activity you have done, when and where it took place and with whom. It will probably

help you if you close your eyes and focus on what you visualise in your mind. Write down what you can see.

The participants responded by typing a description into a survey text box. The participants had to write a minimum of 30 words before completing the task.

Passive control. The participants in the passive control group did not receive any task-related instructions. Instead, the participants assigned to this condition completed the study after listening to the imagery training audio.

Procedure

Following the consent procedure, at baseline participants completed the GAD-7 and the SCQ questionnaires in a randomised order. Following this, they completed the imagery training exercise. The video had to be played in full before they could proceed. Participants were then randomly assigned to one of four groups (Best Possible Self [BPS], Activity Writing, Best Possible Past and Future Self [BPP-FS], Passive Control) and completed their assigned task. Participants in the passive control group did not complete a task. Over the next three consecutive days, participants received another administration of their assigned task (once per day). The passive control group did not complete any tasks during this period. Two weeks post-baseline, participants completed the GAD-7 and SCQ for a second time, in a randomised order.

Data analysis

The data was analysed using SPSS version 29. The differences in the ratings of anxiety symptomology were analysed using a 2 (Baseline vs Follow-up) x 4 (BPS vs Activity Writing vs BPP-FS vs Passive Control) mixed ANOVA. To assess the mediating role of self-esteem, Hayes' PROCESS macro with 5000 bootstrap samples was used. Significance was set at $p < .05$. The indirect effect was considered significant if confidence intervals did not contain zero.

Results

Change in anxiety symptomology

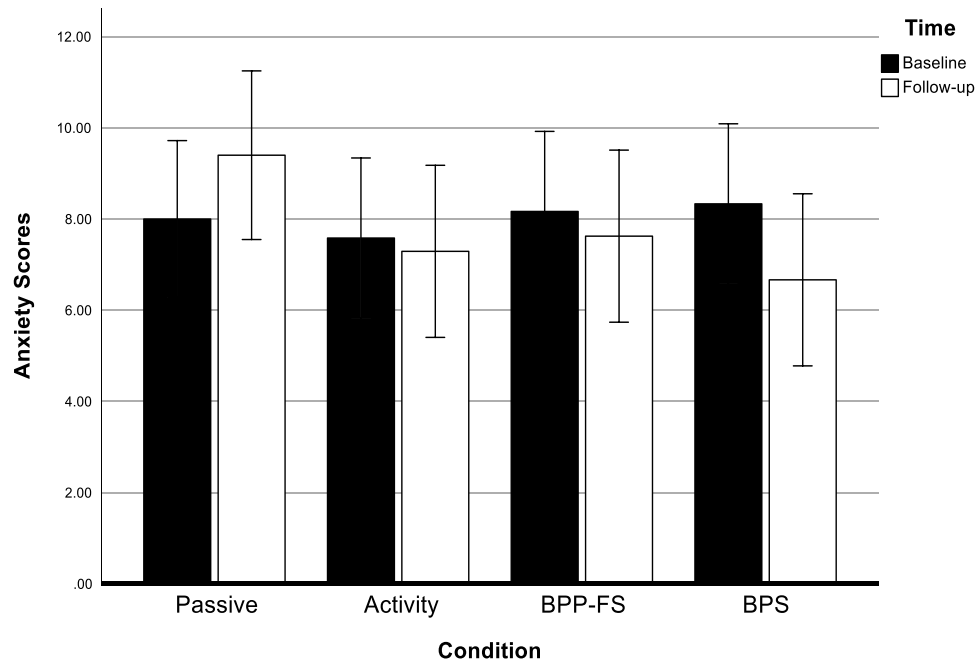
Table 1 displays the Mean (and SD) for Anxiety Scores at Baseline and Follow-up, across conditions. Figure 1 illustrates the change in anxiety scores across conditions.

A 2 (Time: Baseline vs Follow-up) x 4 (Condition: BPS vs BPP-FS vs Activity Writing vs Passive Control) mixed ANOVA showed a non-significant main effect of Time

Table 1. Mean (and SD) anxiety, and self-esteem scores at baseline and follow-up, across conditions.

	BPS		BPP-FS		Activity Writing		Passive Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Anxiety</i>								
Baseline	8.33	4.85	8.17	4.21	7.58	3.93	8	4.28
Follow-up	6.67	4.29	7.63	4.43	7.29	4.16	9.4	5.56
Change score	-1.67	3.21	-.54	3.39	-.29	2.39	1.4	3.16
<i>Self-Esteem</i>								
Baseline	120.88	31.37	117.25	24.17	110.21	20.51	107.36	34.72
Follow-up	124.75	25.48	114.75	22.48	109.42	21.93	108	31.4
Change score	3.88	16.8	-2.5	13.33	-.79	16.75	-.64	18.14

BPS = Best possible self-condition, BPPS= Best possible past self-condition.

**Figure 1.** Change in anxiety scores across condition. Error bars represent 95% confidence intervals.

$F(1,93) = .78, p = .379, \eta^2 = .008$, and a non-significant main effect of Condition $F(3,93) = .47, p = .707, \eta^2 = .015$. However, there was a significant Condition $\times$ Time interaction $F(3,93) = 4.21, p = .008, \eta^2 = .119$. Bonferroni comparisons revealed participants in the BPS condition reported significantly higher anxiety at baseline compared to follow-up ($p = .009$), whereas participants in the passive control condition reported lower anxiety at baseline compared to follow-up ($p = .025$). There was no significant difference in anxiety symptomology for the participants in the activity writing or the BPP-FS condition ($p = .642$ and $p = .388$ respectively).

Mediating role of self-esteem

Table 1 displays the Mean (and SD) for Self-Esteem Scores at Baseline and Follow-up, across conditions. The descriptive statistics showed that the BPP-FS condition reported a decrease in self-esteem, and thus, this group was removed from the mediation analyses.

Instead, the predictor variable in the analysis was whether participants were in the standalone BPS condition or not. The mediator variable was change in self-esteem, and the outcome variable was change in anxiety scores. Baseline self-esteem was entered as a covariate. Results showed that the BPS technique significantly predicted change in self-esteem $b = 7.14, 95\%CI [.25, 14.03], t = 2.06, p = .043$ and change in self-esteem significantly predicted change in anxiety $b = -.08, 95\%CI [-.11, -.03], t = -3.54, p = .001$. The direct effect of the BPS technique on anxiety change was significant $b = -1.58, 95\%CI [-2.97, -.18], t = -2.24, p = .027$. However, the indirect effect via self-esteem was also significant $b = -.52, 95\%CI [-1.31, -.01]$ indicating a partial mediation.

Discussion

The primary aim of study 1 was to examine the efficacy of the BPS technique for reducing generalised anxiety

across two-weeks. In addition, it also aimed to examine whether combining the standalone BPS procedure with envisioning one's best past self could enhance its effects. The results showed that the BPS technique significantly reduced anxiety from baseline to follow-up consistent with previous cross-sectional findings (Duffy et al., 2025). This supports the potential of the BPS as an effective intervention, potentially for individuals who are unable to access immediate therapeutic support. In comparison, the participants in the activity writing control condition experienced no significant change in anxiety across the two weeks. Notably, participants in the passive control condition experienced a significant increase in anxiety, suggesting that engagement in one of the tasks employed in the study could help prevent symptom escalation even if they do not significantly reduce symptomology.

Contrary to the hypothesis, the participants in the combined past and future best self-condition showed no significant change in anxiety, and reported a decrease in self-esteem. As discussed in the introduction, it was hypothesised that incorporating a best past self-task, before the future best possible self-task, could serve to boost self-efficacy in the present, in turn making positive future outcomes feel more credible (Paersch et al., 2022), which could make their ideal future feel more possible. However, in the present study, the inclusion of the past task appeared to inhibit the effects (as observed in the standalone BPS condition) of the BPS technique. One potential explanation for this is that reflecting on a positive ideal past could highlight one's own inadequacies in the present, which could explain the observed decrease in self-esteem. This contrast could lead individuals to feel disconnected from their past achievements and reduce belief in their capabilities. As a result, when they imagine the future, the sense of decline they envisioned from the past to the present could result in feelings of helplessness going forward. To address this, future research should try and modify the instructions for the best past self-technique. For example, reframing the instructions to focus on specific instances of past success (e.g. describe a time when you succeeded in an area of importance) rather than a best version of themselves that exists no more.

Study 1 also aimed to investigate whether self-esteem mediates the effects of the BPS technique on anxiety. As mentioned in the introduction, the BPS technique could reduce anxiety by enabling individuals to pre-live future events and experience how it would feel to inhabit that future state (Erikson, 2007). This immersive process can elicit emotional responses and can impact subjective feelings of self-worth (i.e. self-esteem) in the same way actual experiences can (Duffy

et al., 2025). In addition, since low self-esteem can contribute to high anxiety, the present study proposed that self-esteem could mediate the effects of the BPS task. Consistent with this proposed theory, the results from the present study revealed a partial mediation. As such, the BPS technique boosts self-esteem, which can reduce anxiety indirectly, since self-esteem contributes to symptomology. However, since the mediation was partial, other mechanisms may also explain the effects of the BPS technique on anxiety. Future research could examine alternative mediators, such as self-efficacy (belief in one's capabilities) which can also contribute to anxiety (Bandura, 1991). Another possibility is that the BPS reduces the prominence of negative imagery, a bias often observed in individuals with high anxiety (Duffy et al., 2024).

Overall, the results from Study 1 highlighted the efficacy of the BPS technique for reducing anxiety over two weeks. However, questions still remain regarding the frequency that is required to produce positive effects. Specifically, do individuals need to complete the BPS technique on four occasions to experience a significant reduction in symptomology (as employed in the original BPS experiments (King, 2001) and in Study 1), or is one session enough to produce positive effects. In addition, Study 1 did not assess the impact of mental imagery ability, which refers to an individual's ability to form mental images (Andrade et al., 2014). Since the BPS technique requires individuals to visualise their best future in as much detail as possible, individual differences in imagery capacity could moderate the effectiveness of the task, something which Study 1 did not examine. In addition, a related concern involves the necessity of imagery training and whether it is required to produce significant reductions in anxiety or not. Study 2 aimed to answer these questions.

Study 2

Extensive research has already investigated under what conditions the BPS technique is most effective (see Loveday et al., 2018 for a discussion). As a whole, the BPS technique is flexible in terms of delivery. For instance, the BPS does not have to be completed through writing passages, instead participants can describe their best-self verbally or even pictorially (Loveday et al., 2018; Owens & Patterson, 2013). In addition, research shows that it can be delivered one-to-one, in small groups or online using survey software (Carrillo et al., 2019; Layous et al., 2013). However, several factors related to the task and participants characteristics could influence the effectiveness of the BPS technique in reducing anxiety. These could include the frequency of task

completion and individual differences in imagery capacity. The following sections will discuss each of these factors in detail.

First, it is important to explore *how often* the BPS should be delivered (i.e. task frequency). In the first BPS experiment, the participants completed the technique once a day across four consecutive days (King, 2001), whereas, Peters et al., (2016) found positive effects from completing just one session. Thus, more research is necessary to understand the optimal frequency, as there is a risk for both over, and under, prescribing psychological interventions. For instance, Lyubomirsky et al. (2005) found that a positive psychological intervention involving counting one's blessings, was less effective when delivered three times a week compared to once a week. Thus, the BPS could be just as effective (or more effective) when delivered once a week as opposed to four times a week (as examined in Study 1). However, insufficient delivery of an intervention could result in a 'watering down' effect, reducing its overall impact (Loveday et al., 2018).

In addition, since the BPS is primarily a mental visualisation exercise (i.e. participants are instructed to use as much sensory information as possible (e.g. visual, auditory, tactile) to form a clear image of their future-self) it is important to explore the role of mental imagery capacity. Mental imagery capacity refers to an individual's ability to form mental images which varies across individuals (Andrade et al., 2014). To our knowledge, only one study has examined the moderating impact of imagery capacity on the effectiveness of the BPS task (Odou & Vella-Brodrick, 2013). Odou & Vella-Brodrick found that the BPS technique was beneficial for individuals regardless of their imagery capabilities (Odou & Vella-Brodrick, 2013). However, the study did have key limitations, including low statistical power, and the use of an outdated measure of imagery capacity (see Andrade et al., 2014 for a discussion). In addition, they did not categorise imagery capacity according to specific sensory modalities. This could be an important consideration because research shows that visual imagery produces stronger emotional effects than verbal processes (e.g. seeing the crowd laughing at your presentation skills as opposed to hearing them) (Holmes et al., 2008). Thus, individuals with higher visual capacity could experience stronger emotional responses to the BPS technique compared to individuals with higher capacity in other sensory modalities. In addition, it is also important to investigate whether imagery training is necessary for the BPS technique to reduce anxiety. Research suggests that individuals spend a significant amount of time envisioning their future; thus, the BPS task instructions should not feel entirely unfamiliar. However, since mental imagery

capacity can vary across populations (Andrade et al., 2014), providing individuals with imagery training could be an important task requirement, particularly for those participants with low capability. Previous research has reported positive effects of the BPS regardless of whether they have imagery training or not (Loveday et al., 2018); however, Study 2 will explore the benefits of the BPS technique without imagery training to try and replicate these findings when anxiety is the outcome measure.

Thus, the primary aim of Study 2 was to assess the impact of varying frequencies of the BPS technique. To investigate this, Study 2 compared the effectiveness of four-sessions of the technique (used in study 1) against three other frequencies (1 session, 2 sessions, 3 sessions) and a passive control condition. Based on the results from Study 1, it was hypothesised that regardless of frequency, all participants would experience a significant decrease in anxiety following the BPS technique, whereas participants in the passive control condition would experience no such change. However, since research examining the impact of varying sessions is limited, no hypotheses were made regarding frequency effect, and instead these analyses were exploratory.

In addition, Study 2 also aimed to explore the moderating effects of imagery capacity. As discussed in the introduction, previous research has reported no significant effects of imagery capacity on the effectiveness of the BPS (Odou & Vella-Brodrick, 2013). However, Odou and Vella-Brodrick employed an outdated measure of imagery capacity and never assessed the moderating effects of *visual* imagery capacity specifically. Since visual imagery can produce stronger emotional effects to verbal processes (Holmes et al., 2008), it was hypothesised that visual imagery ability would moderate the effectiveness of the BPS for reducing anxiety. However, it was hypothesised that imagery capacity as a whole (across all sensory modalities) would not significantly moderate the effectiveness of the BPS (consistent with Odou & Vella-Brodrick, 2013).

Methods

Participants and study design

A minimal sample size of 95 was determined based on a priori power analysis conducted on G*Power. The inclusion criteria that were adopted for this study were as follows: (1) Aged over 18 (2) Fluent in English (3) UK resident (4) Not currently receiving psychological or pharmaceutical intervention.

A randomised control trial was employed with condition assignment (Passive Control vs one session vs two

sessions vs three sessions vs four sessions) representing the independent variable and anxiety scores (baseline vs follow-up) representing the dependent variable. Participants were recruited through an online research participation program and social media. The participants who completed the study through the online research participation program received points as partial fulfillment to a module requirement. All other participants received a £10 voucher for completing the study. All participants provided informed consent and ethics approval was granted from a university Ethics Committee.

A total of 165 participants were initially enrolled in the study. However, 47 participants were excluded from the analysis due to incomplete data resulting in 118 participants completing the study (92 female, 19 males, 7 non-binary, mean age = 19.63, $SD = 2.26$). No significant differences were observed between participants who dropped out and those who completed the study in terms of baseline anxiety scores ($Z = -0.51, p = .613$) or imagery capacity ($t(163) = 0.52, p = .302$). At baseline, there were no significant differences between the five groups in terms of generalised anxiety ($H(4) = 7.69, p = .104$) or imagery capacity ($F(4, 113) = 0.47, p = .757$).

Materials

Generalised Anxiety Disorder Questionnaire (GAD-7)

The Generalised Anxiety Disorder Questionnaire (GAD-7) (Spitzer et al., 2006) is a 7-item measure assessing generalised anxiety, as explained in Study 1.

Plymouth Sensory Imagery Questionnaire

The Plymouth Sensory Imagery Questionnaire (Psi-Q; Andrade et al., 2014) assess seven domains of mental imagery capacity: visual (e.g. 'Imagine the appearance of a sunset'), auditory (e.g. 'Imagine the sound of an ambulance siren'), olfactory (e.g. 'Imagine the smell of a stuffy room'), gustatory (e.g. 'Imagine the taste of lemon'), tactile (e.g. 'Imagine touching fur'), bodily sensation (e.g. 'Imagine the bodily sensation of threading a needle') and, feeling (e.g. 'Imagine feeling excited'). Participants are asked to rate items on a scale of 0 ('No image at all') to 10 ('Image as clear and vivid as real life'). Total imagery score is calculated by averaging across domains. Visual imagery capacity score was calculated by averaging the items for that domain. Scores range from 0–10. Higher scores indicate higher imagery capacity. The questionnaire has good reliability and validity (Andrade et al., 2014).

Best Possible Self (BPS). Consistent with Study 1, participants were informed that the study aimed to

investigate individual differences in mood changes over two weeks. No imagery exercise was used in this study, in order to investigate if imagery training is necessary to produce a significant reduction in anxiety. The participants in one of the four BPS conditions completed the same task presented in study one. Also, consistent with study one, the participants had to type a minimum of 30 words before completing the task. Depending on what condition the participants were in, they were exposed to varying frequencies of the BPS technique.

One session. Participants who completed one session of the BPS, completed the task at baseline, and then only completed the GAD-7 after 2-weeks.

Two sessions. Participants who completed two sessions, completed one task at baseline, followed by a second task the following day. They then completed the GAD-7 after two weeks.

Three sessions. Participants who completed three sessions, completed one task at baseline, and two additional tasks over the next two days, followed by final assessments after two weeks.

Four sessions. Participants who completed four sessions, completed one task at baseline, and an additional task each day for the next four days. The GAD-7 was then completed after two-weeks.

Passive control. The participants in the passive control condition, did not complete any task. Instead, the participants in this condition only completed the GAD-7 and the Psi-Q at baseline.

Procedure

Participants were randomly assigned to one of five groups: Passive Control, One Session, Two Sessions, Three Sessions, Four Sessions. All participants completed the GAD-7 and Psi-Q at baseline. Participants in the passive control group completed only the baseline and follow-up assessments. In the intervention groups, participants completed varying numbers of BPS sessions: one session at baseline (1 Session), two sessions over two days (2 Sessions), three sessions over three days (3 Sessions), or four sessions over four days (4 Sessions). All participants completed the GAD-7 two weeks after completing baseline measures.

Analysis plan

Data were analysed using SPSS version 29. To assess differences across conditions over two-weeks, a 2

(Baseline vs Follow-up) $\times$ 5 (Condition: Passive Control vs one session, vs two sessions, vs three sessions, vs four sessions) mixed ANOVA was conducted. Potential moderating effects of imagery capacity were indicated by a significant three-way interaction between the moderator, group assignment, and time.

Results

Change in anxiety symptomology

Table 2 displays the Mean (and SD) for Anxiety Scores at Baseline and Follow-up, across conditions. Figure 2 illustrates the change in anxiety scores across conditions.

A 2 (Time: Baseline vs Follow-up) $\times$ 5 (Condition: Passive Control vs one Session vs two Sessions vs three Sessions vs four Sessions) mixed ANOVA showed a non-significant main effect of Condition $F(4,113) = 1.7$, $p = .156$, $\eta^2 = .057$, and a non-significant Condition $\times$ Time interaction $F(4,113) = .88$, $p = .479$, $\eta^2 = .03$. However, there a significant main effect of Time $F(1,113) = 15.96$, $p < .001$, $\eta^2 = .124$. Bonferroni comparisons revealed that participants who received two, three and four sessions of the BPS technique reported significantly higher anxiety at baseline compared to follow-up

($p = .008$, $p = .045$, and $p = .017$ respectively). Participants in the Passive Control condition or who received one session reported a non-significant change in anxiety from baseline to follow-up ($p = .794$ and $p = .120$ respectively).

Moderating effects of imagery capacity

On average participants scored 6.42 ($SD = 1.63$) on the imagery capacity scale and 7.52 ($SD = 1.87$) on the visual imagery subscale. When imagery capacity was entered into the ANOVA, there was a non-significant three-way interaction between Condition $\times$ Time $\times$ Imagery Capacity $F(5,112) = .87$, $p = .507$, $\eta^2 = .037$. Likewise, when the visual imagery subscale was entered into the ANOVA, there was a non-significant three-way interaction, $F(5,112) = 1.66$, $p = .15$, $\eta^2 = .069$. These results indicate that total imagery capacity, and the visual imagery subscale were non-significant moderators.

Discussion

The aim of Study 2 was to examine the impact of varying sessions of the BPS technique for reducing generalised anxiety. It was hypothesised that the participants in the BPS conditions would experience a significant reduction

Table 2. Mean (and SD) anxiety scores at baseline and follow-up, across conditions.

	Passive Control		1 Session		2 Sessions		3 Sessions		4 Sessions	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Baseline	9.05	4.9	12.15	4.68	11.23	4.93	8.91	5.94	10.82	4.96
Follow-up	8.86	4.8	11.15	5.88	9.5	5.23	7.5	5.42	9.14	5.54
Change Score	-.18	2.4	-1	3.86	1.73	3.44	1.41	2.38	1.68	3.71

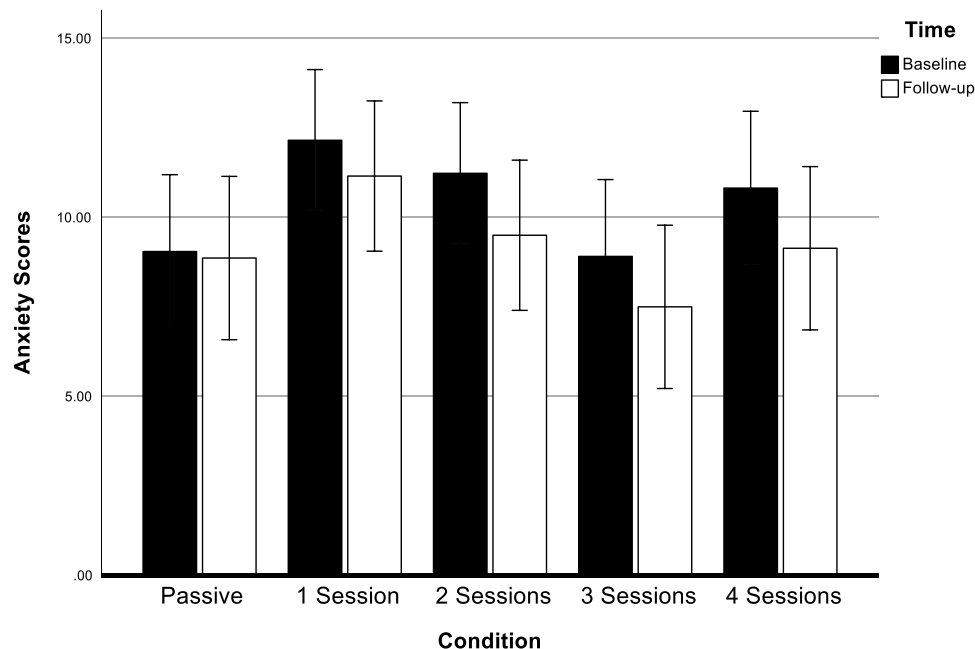


Figure 2. Change in anxiety scores across condition. Error bars represent 95% confidence intervals.

in anxiety over two weeks (consistent with study 1). The results showed that anxiety significantly reduced for participants who completed two or more sessions (Conditions 2, 3, and 4). This result is consistent with Study 1 and with previous cross-sectional findings (Duffy et al., 2025), highlighting the potential benefits of the BPS as an intervention for reducing generalised anxiety. Notably, Study 2 omitted the imagery training exercise used in Study 1, and the BPS technique still produced significant reductions in anxiety. This supports prior findings that imagery training may not be essential for the task to produce positive effects (Loveday et al., 2018). Participants who only completed one session of the technique reported a decrease in anxiety over time, however, contrary to the hypotheses, this change was not significant. Similarly, participants in the passive control condition did not show any significant change in anxiety. These findings suggest that more than one session over two weeks is necessary to produce a significant reduction in generalised anxiety.

These results raise important questions for future research, for instance, it remains unclear whether the two sessions need to be administered on consecutive days or whether one session per week would be equally effective. Additionally, further research is needed to assess the longevity of the intervention's effects, including when the benefits begin to diminish and when subsequent sessions may be required to sustain improvements in anxiety.

Study 2 also aimed to investigate whether imagery capacity moderates the effectiveness of the BPS technique. In the present study imagery capacity scores were consistent with the typical average imagery scores represented in the general population (e.g. 7.05; Andrade et al., 2014). Consistent with previous research (Odou & Vella-Brodrick, 2013), imagery capacity across all sensory modalities did not moderate the intervention's effects. This suggests that the BPS technique can be effective regardless of participants' imagery ability, even in the absence of imagery training. Contrary to the hypothesis, the visual imagery sub-scale also did not moderate the effectiveness of the BPS task. As discussed in the introduction, it was hypothesised that visual imagery would play a key role, as it has been shown to produce stronger emotional responses than imagery relying on other sensory modalities (Holmes et al., 2008). Thus, it was expected that participants with higher visual imagery capacity would experience greater reductions in anxiety. However, the findings suggest that the task's effectiveness is not dependent on the ability to generate vivid visual imagery. This reinforces the accessibility of the BPS technique, as individuals with lower visual imagery capacity can still benefit from the

intervention. However, it is still unclear what participants are thinking, and whether they use mental imagery when completing the BPS technique. To address this, future research could ask participants the extent that they used imagery when completing the task and what type of imagery they used. This could help to establish if participants who use more mental imagery during the task experience larger decreases in anxiety, rather than assessing mental imagery ability in general.

Overall discussion

In summary, the present article presented two studies that highlighted the efficacy of the BPS technique for reducing generalised anxiety over two weeks. Study 1 examined the mediating role of self-esteem and found that self-esteem partially mediated the effects of the BPS on anxiety. This suggests that changes in self-esteem could help explain how the BPS intervention reduces anxiety. Specifically, it is possible that by envisioning a positive, ideal future, individuals may '*pre-live*' the emotions associated with that future, which can positively impact their sense of self-worth. These findings support the proposed mechanism of the BPS technique discussed in the introduction and emphasise the emotional benefits (in the present) of imagining an ideal future. Future research should aim to replicate these findings and explore this and other potential mechanisms that may contribute to the BPS's effects on anxiety.

The effects of the BPS technique on anxiety persisted regardless of whether imagery training was delivered or not. In addition, the outcomes of the BPS were not moderated by individual differences in mental imagery capacity (across all modalities and for visual imagery specifically). These findings highlight the accessibility of the BPS technique, as individuals with lower visual imagery capacity can still benefit from the intervention. The results from Study 2 demonstrated that multiple sessions of the BPS technique (two or more sessions over two weeks) are required to result in significant reductions in anxiety. Notably, participants who completed only one session did not report significant reductions, emphasising the importance of multiple sessions for achieving significant improvements in anxiety.

Furthermore, since the BPS task was delivered entirely online using survey software, it offers a convenient and cost-effective solution for intervention delivery (Muñoz et al., 2018). As highlighted in the introduction, generalised anxiety is highly prevalent in the general population, yet access to therapeutic support is often limited due to high demand (Lattie et al., 2022; Revicki et al., 2012). This creates a need for accessible interventions that can alleviate symptoms of anxiety for individuals

who are waiting for more formal treatments, such as cognitive behavioral therapy (Muñoz et al., 2018). The findings of this study provide initial support for offering the BPS technique to individuals on waiting lists. In addition, given that the BPS benefitted individuals who scored below the cutoff for probable generalised anxiety, the BPS technique may be useful as an early intervention to prevent the escalation of anxiety symptoms.

However, further research is required to fully understand the parameters that influence the effectiveness of the BPS technique. In particular, future studies should explore potential moderating factors beyond imagery capacity, which was examined in this study. Also, if the BPS technique is to be developed into an intervention, it is important to consider how it could be enhanced by incorporating it with other interventions. In addition, allowing individuals to choose how they engage with the task (e.g. through drawing or writing about their ideal future) could increase both accessibility and motivation to complete the intervention. However, before such large-scale applications are considered, further research is necessary to evaluate the impact of these modifications on the effectiveness of the BPS technique.

Limitations

The present article has several limitations that readers should be aware of when interpreting the results. First, the sample in the present article, consisted predominantly of university students, thus the results are only representative of this sample. However, generalised anxiety is particularly prevalent among university-level students, with one in three undergraduates experiencing elevated levels (Ahmed et al., 2023) thus, it is still useful to report findings on a potential intervention for this sample specifically. However, future research should investigate the effectiveness of the technique for different populations. In addition, since a non-clinical sample was used, the results may not generalise to clinical populations. However, future research should replicate the results of the present article with a clinical sample. Finally, the decrease in scores observed in the present research may have been influenced by a placebo effect, especially if participants were aware of being in an intervention condition. To address this limitation, future research should replicate the study with the inclusion of a longer follow-up assessment to evaluate whether the observed effects are sustained over time.

Conclusion

The present articles provide initial evidence for the efficacy of the BPS technique in reducing generalised

anxiety over two weeks. Notably, the technique was effective without imagery training, and the participants' imagery capacity did not moderate the effectiveness of the technique. Study 1 also provided initial evidence for the potential mediating role of self-esteem and study 2 demonstrated that a minimal intervention (two sessions over two weeks) can be sufficient to achieve significant reductions in anxiety. These findings offer promising evidence for the BPS intervention as a low-cost, easily accessible tool for reducing anxiety, especially in situations where formal therapeutic support is not immediately available. Future research should explore the efficacy of the technique in clinical samples, as well as explore the effects of combining the BPS with other interventions (e.g. cognitive behavioural therapy). Overall, the results from the present article highlight the potential of the BPS for reducing generalised anxiety.

Disclosure statement

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