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Public Speaking Anxiety: Past, Present, and Future

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Public Speaking Anxiety: Past, Present, and Future

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Author's Declaration

I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.

Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.

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Thesis Summary

For most of the population, public speaking is an anxiety and / or fear-provoking experience. It can often result in poor performance and missed educational, social, and professional opportunities. However, the construct of public speaking anxiety (PSA) is an area that has seen limited exploration, especially in the UK (with only a handful of studies conducted). As will become evident in the introduction of this thesis, limitations and ambiguities in the definition and conceptualisation of relevant constructs may have hindered progress in this area. Furthermore, as the frequency of individuals experiencing PSA continues to increase, current assessment and treatment options may have to be modernised to keep up. To rectify these issues, this thesis first highlights strengths and limitations in applied and theoretical research via a systematic review and meta-analysis of relevant literature. This leads to the need for the development of a self-report measure to aid future research and applied interventions in this area. Finally, a novel intervention is tested with the application of our new measure via improvisation to reduce anxiety and increase self-efficacy in public speaking settings.

This thesis consists of five chapters: an introductory chapter, three empirical chapters, and a general discussion. As the main purpose of the thesis focuses on the production of three research papers examining issues in public speaking research, overlap and repetition inevitably occurs. Chapter 1 begins by outlining current limitations observed regarding definitions and conceptualisations of public speaking, public speaking anxiety (PSA), and fear of public speaking (FoPS). The purposes and format of this thesis are then discussed.

Chapter 2 comprises a systematic review and meta-analysis of public speaking anxiety (PSA) interventions over the past 23 years. 26 studies met the inclusion criteria, and the research had a moderate-to-high methodological standard, with interventions varying in type, duration, and focus (e.g., symptom vs. source). This review provides support for the efficacy of psychological interventions to reduce anxiety related to public speaking.

However, further research is warranted to examine long-term efficacy, real-world implications, sources of fear/anxiety, self-efficacy development, and individual differences in treatment assignment.

Chapter 3 consists of three studies aimed at developing and validating a new measure of public speaking anxiety that sets out to identify specific sources of threats to public speaking. Study 1 (n = 248) focused on the item development of the Public Speaking Threats Questionnaire (PSTQ), resulting in a three-factor model consisting of physiological arousal, self-perceptions, and external judgements. Bayesian structural equation modelling (BSEM) was used to validate the initial model. Study 2 (n = 709) further validated the 27-item measure using a larger, more heterogeneous sample. Evidence of the criterion validity of the PSTQ is also presented. Study 3 examined test-retest reliability and predictive validity using a sample from a UK university (n = 131). Results highlight some of the potential shortcomings of current university experience in reducing public speaking anxiety (PSA).

Chapter 4 examines the efficacy of a public speaking anxiety intervention. This pilot intervention (n = 22) explores the efficacy of actor and improvisation theatre training in reducing PSA and increasing public speaking self-efficacy. The Improv Self-Efficacy and Skills Program (ISESP) was developed by the first author, a public speaking expert specialising in acting and improvisational theatre techniques. The experimental group received 12 hours of training over three weeks (6 x 2 hours), while the control received a ½ day version of the program (3 hours) after the 6-month follow-up. The results indicated that participation in the ISESP led to significant improvements in speech duration and self-efficacy along with significant reductions in public speaking anxiety, discomfort, physiological arousal threats, and self-perception threats. However, no between-group statistical significance was observed. A relatively small sample size may have contributed to this finding.

Chapter 5 concludes the thesis by providing a general summary and discussion of the findings, theoretical and applied implications, limitations, and future directions.

Chapter 1: General Introduction

Public speaking is a frequently required skill in both educational and occupational settings. In education, it is used repeatedly to test students' knowledge and understanding of topics and is critical for the development of work-ready graduates (Caballero & Walker, 2010; Joughin, 2007). In occupational settings, public speaking is a core employability skill that is desired over traditional technical skills (Blume et al., 2013; Robles, 2012). Nevertheless, this skill is often lacking in graduates (Davies et al., 2012). Public speaking often elicits anxiety, worry, apprehensions, and in extreme cases, fear, panic, and avoidance. An estimated 63% of people fear public speaking (Marinho et al., 2017), with 18% rating it as more fearful than death (Dwyer & Davidson, 2012). Furthermore, Beidel and Turner (2007) found that public speaking anxiety impairs up to 97% of individuals with social anxiety.

Research has shown that public speaking anxiety (PSA) can negatively affect critical thinking skills in group discussions, hinder the ability to focus, think clearly, articulate speech effectively, and reduce overall public speaking performance (Blume et al., 2010; Hofmann et al., 1997; Voncken & Bögels, 2008). Furthermore, PSA can lead to other maladaptive behaviours (e.g., avoidance), resulting in negative occupational, educational, and social consequences (Aderka et al., 2012). This is particularly relevant in domains in which public speaking is often a requisite (i.e., higher education). In university settings, Russell and Topham (2012) found that 80% of students reported oral presentations as a source of social anxiety that negatively impacted learning and well-being. Furthermore, Grieve et al. (2021) reported that PSA had an overall negative effect on students' university experience. While the results of these studies are troubling, especially from an institutional viewpoint, 89.3% of students desire classes to improve their public speaking skills (see Marinho et al., 2016).

Anxiety and Performance

Not only is anxiety extremely uncomfortable for individuals, but its impact on performance can be variable. While anxiety can be optimising for performance (Eysenck et al., 2007), it can often impair performance, and in extreme cases lead to performance catastrophes. One model that can explain the underlying causes of performance catastrophes is Hardy's (1990) cusp catastrophe model. This model predicts a complex interaction between cognitive anxiety, physiological arousal, and performance.

According to Hardy's (1990) model, when physiological arousal is low, increasing levels of cognitive anxiety has a positive relationship with performance. However, when physiological arousal is high, increasing levels of cognitive anxiety has a negative relationship with performance. At low levels of cognitive anxiety, physiological arousal has an inverted U-shaped relationship with performance (Yerkes-Dodson Law, Yerkes & Dodson, 1908). Essentially, optimal performance occurs at moderate arousal levels. However, when cognitive anxiety is high and physiological arousal continues to increase, at some point a performance catastrophe will occur (where performance drops precipitously). Once a performance catastrophe has occurred, a substantial reduction in physiological arousal is required before performance can revert to optimal levels. The difference in physiological arousal levels between the catastrophic drop in performance (normally high) and the return to optimal levels (normally lower) is termed hysteresis. The quickest way to reverse a performance catastrophe in this model is to reduce both cognitive anxiety and physiological arousal.

Transferring this model to the social anxiety domain, Strahan and Conger (1999) proposed that the catastrophe model could explain why social performance catastrophes occur. They hypothesised that, at high levels of self-efficacy, individuals should experience minimal cognitive anxiety, leading to an inverted U-shaped relationship between social performance and physiological arousal. However, those high in social anxiety are more likely

to enter social interactions with the expectation that their performance will not meet the expectations of others (Strahan & Conger, 1999). When this occurs, social performance catastrophes are likely to occur.

We propose that public speaking can be envisioned as a situation in which social performance catastrophes can occur. Not only is the outcome of an individual's performance at stake (e.g., job interview, grade outcome, sales pitch) but also potential social consequences (e.g., rejection from the group) and potential exposure to public humiliation (causing dejected-related emotions). The catastrophe model also provides a potential explanation for why reversion to optimal public speaking performance may take time (or may even require the person to leave the situation to lower physiological arousal before returning to continue).

Anxiety and Working Memory

As public speaking is a cognitively demanding task, an exploration of how anxiety influences the mechanisms of working memory and attention is worth including in this thesis. One pertinent area of research revolves around Baddeley's (2001) updated model of working memory. This model proposes a multi-component system comprising a central executive (responsible for attention and active information processing), phonological loop (responsible for the storage of verbal material), visuospatial sketchpad (responsible for the storage of visual and spatial information), and episodic buffer (responsible for representing and integrating inputs from the other three components and long-term memory systems). Furthermore, each system has a finite cognitive load.

Expanding on Baddeley's (1996) earlier work, Miyake et al. (2000) identified three major functions of the central executive: inhibition, shifting, and updating. The inhibition function involves using attentional control to prevent attentional resources from being diverted to task-irrelevant stimuli and responses, thereby maintaining task goals (Friedman & Miyake, 2004). The shifting function involves the capacity to shift attention between multiple

tasks or mental states (Miyake et al., 2000). Furthermore, it allows behaviours and thoughts to be adapted to meet the needs of a changing situation. Finally, the updating function involves the continuous monitoring and updating of one's working memory (Miyake et al., 2000).

Attentional Control

Smith and Kosslyn (2007) define attention as a cognitive system that facilitates the selection or inhibition of stimuli for additional processing. Without this, the human brain would attempt to process every piece of information in front of it. Attentional control theory (ACT; Eysenck et al., 2007), an expansion of Eysenck and Calvo's (1992) processing efficiency theory, posits that anxiety can impair attentional control. According to ACT, attention is regulated by a goal-directed attentional system (top-down processing) and a stimulus-driven attentional system (bottom-up saliency). Anxiety disrupts the balance between these two systems, diverting cognitive resources from task-relevant to task-irrelevant cues. This reallocation of cognitive resources decreases performance in tasks involving the central executive. Furthermore, Eysenck et al. (2007) suggested that anxiety primarily affects inhibition and shifting functions but not the updating function.

Public speaking is a cognitively demanding task that requires the speaker to engage in multiple tasks (e.g., recalling content and utilising vocal and physical skills), switch attention between sub-tasks (e.g., between slides and audience responses), while inhibiting task-irrelevant cues (e.g., public speaking threats). Additionally, both task demands, and the saliency of task-irrelevant cues can fluctuate dramatically throughout a public speaking situation. For example, when a person undergoes a public speaking task, the goal-directed attentional system aims for the person to complete the task, and the stimulus-driven attentional system is sensitive to internal and external threats. If public speaking internal or external threats achieve sufficient saliency, attention will switch from task-relevant cues (e.g.,

completing the verbal presentation) to task-irrelevant cues (paying attention to sources of threat), thereby reducing attentional control.

Conceptualisation of Public Speaking Anxiety

A limitation of the current literature is the lack of conceptual clarity regarding public speaking. Without clear consensus on what it is and what it is not, past, current, and future research may fail to investigate the same phenomena. This section aims to provide conceptual clarity and to propose a working definition of public speaking. This definition may be redefined and extended over time, as new findings emerge. For example, as the terms 'presentations,' 'oral presentations,' and 'verbal presentations' are used synonymously with 'public speaking,' the authors posit they should follow the same working definition. For simplicity, this thesis will use the term 'public speaking' to represent all of the above.

The authors consulted public speaking definitions reported in the current literature and the Merriam-Webster, Oxford English, and Cambridge Online dictionaries for definitions of 'public,' 'speaking,' and 'public speaking.' Table 1.1 displays current definitions of public speaking.

Table 1.1

Definitions of Public Speaking from English-Language and Current Literature

Source	Definition
Alberts et al. (2011, p. 306)	"The process of speaking with a purpose to a group of people in a relatively formal setting."
Guest (2018, p. 131)	"A mode of communication that tends to be uni-directional, (semi-) formal and has specific language (e.g., intonation) and non-language-related (e.g., body language) features."
Sullivan (2009, p. 425)	"The act of talking to an audience to inform, persuade, and/or entertain."
Merriam-Webster Dictionary	Public: "exposed to general view" / "of, by, for, or directed to the public." Speaking: "that involves talking or giving speeches." Public Speaking: "the art or process of making speeches in public."
Oxford English Dictionary	Public: "in a public place; before spectators or onlookers, openly, without concealment." Speaking: "To utter or pronounce words or articulate sounds" and "to use or exercise the faculty of speech" and "to deliver speech or formal address in an assembly of any kind." Public Speaking: "the action or practice of addressing public gatherings; the making of speeches."
Cambridge Dictionary	Public: "in a place where people can see you – something done in public where anyone can see or hear it." Speaking: "the act or skill of giving a speech at a public event." Public Speaking: "the activity of speaking on a subject to a group of people."

Considering the above, the authors expand on Guest's (2018) definition and propose a new working definition of public speaking as "a form of oral communication, typically in front of one or more persons, that tends to be uni-directional, (semi-)formal and has specific verbal and non-verbal components." The authors argue that this definition encapsulates situations that may normally be missed when discussing public speaking and public speaking anxiety (e.g., speaking up in class or asking a question). Furthermore, owing to technological advancements and the increase in remote and hybrid working (with the COVID-19 pandemic as a catalyst), public speaking environments can be in vivo and/or virtual. Typically, the audience falls into one of three categories: peers (e.g., colleagues, classmates, friends), authority figures (e.g., teacher, examiner, boss), or unknown (no known interpersonal connection to the speaker). This working definition provides further conceptual clarity and will be used throughout this thesis.

Conceptualisation Issues

Another limitation observed is the conceptualisation of public speaking anxiety (PSA). Across the psychological literature (and colloquially), various terms are used synonymously to describe the physiological and psychological elicitations related to public speaking. These include public speaking anxiety (PSA; Bodie, 2010), fear of public speaking (FoPS; Blöte et al., 2009), communication apprehension (CA; McCroskey, 1977), public speaking apprehension (Ayres & Ayres, 2003), stage fright (Jangir & Govinda, 2018), speech fright (Dwyer, 1998), and performance anxiety (Bögels et al., 2010). However, many studies use these terms interchangeably, often implementing anxiety measures to assess fear, and vice versa (e.g., LeFebvre et al., 2020). This section discusses the current definitions of PSA and presents a reconceptualisation of PSA, drawing on several theoretical frameworks.

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association [APA], 2013) characterises social anxiety disorder (SAD) as a "marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others" (p. 202). While an individual may experience anxiety in several social situations (e.g., speaking in public, eating in front of others, meeting new people), the DSM-5 added a performance-only specifier to characterise individuals whose anxiety is limited to speaking or performing in public (APA, 2013). Therefore, performance anxiety exists as both a specific subtype of SAD (where fear or anxiety manifests only in performance situations, such as public speaking) and a generalised subtype of SAD (where the individual exhibits fear or anxiety in various interactional situations).

Previous literature suggests that SAD exists on a continuum, ranging from absent, low, mild, to severe social anxiety symptomology (Bögels et al., 2010; Boyers et al., 2017; Fuentes-Rodriguez et al., 2018). According to Bögels et al. (2010), compared to generalised SAD, performance anxiety has a low genetic component, develops later in adolescence, is unrelated to certain personality characteristics (i.e., shyness, reticence), has a stronger

psychophysiological response to speech situations, and responds to anxiolytic medication (i.e., beta-blockers), whereas patients with generalised or other types of SAD do not.

At present, the APA has no set definition of what PSA is (or is not). Bodie (2010) describes PSA as "a situation-specific social anxiety that arises from the real or anticipated enactment of an oral presentation" (p. 72) and is commonly cited in the literature. However, several other definitions have been proposed in recent years, as presented in Table 1.2. Although these definitions aim to provide some clarity on the construct of PSA, ambiguity still occurs, with some confusion or failure to separate fear from anxiety (e.g., Ebrahimi et al., 2019). In their meta-analysis, Horigome et al. (2020) initially separated the constructs of PSA and fear of public speaking (FoPS). However, during their discussion, they failed to differentiate between the two, using them interchangeably.

Table 1.2

Definitions of PSA from Current Literature

Source	Definition
Bodie (2010, p. 72)	"A situation-specific social anxiety that arises from the real or anticipated enactment of an oral presentation."
Brandrick et al. (2020, p. 2)	"FoPS or PSA is a context-dependent social anxiety occurring during real or imagined enactment of oral speeches, such as presentations and interviews."
Gallego et al. (2022, p. 783)	"Public speaking anxiety is considered a social anxiety disorder and refers to the anxiety that an individual experiences when giving a speech or preparing to speak in front of others."
Hinojo-Lucena et al. (2020, p. 2)	"PSA is related to the fear of speaking in front of others, which increases anxiety levels of a person in a public speaking situation."
O'Hair et al. (2010, p. 98)	"Fear or anxiety associated with a speaker's actual or anticipated communication to an audience."
Reeves et al. (2022, p. 2)	"The experience of individuals who converse easily in everyday social interactions but experience physiological, behavioural, and cognitive symptoms when delivering or anticipating the delivery of a speech in front of a group of people."

PSA = public speaking anxiety; FoPS = fear of public speaking.

Differentiating PSA from FoPS

Although research would indicate that PSA and FoPS are related constructs, research has also shown that they are in fact distinct entities and should be treated as such. In doing so,

confusion both from theoretical and applied perspectives should abate. One theory that does theoretically separate fear from anxiety is Gray and McNaughton's (2000) revised Reinforced Sensitivity Theory (rRST). According to these authors, three distinct neuropsychological systems of emotion and motivation exist. These are called the fight-flight-freeze system (FFFS), behavioural inhibition system (BIS), and behavioural approach system (BAS). The FFFS and BIS are concerned with aversive stimuli and constitute the defensive system, while the BAS mediates reactions to all appetitive stimuli and generates anticipatory pleasure (Corr & Cooper, 2016).

The FFFS is associated with fear and activates avoidance/escape behaviours. Its purpose is to reduce the discrepancy between the immediate threat(s) and the desired state of safety (Corr & Cooper, 2016). Flight and active avoidance occur when threatening stimuli must be avoided. However, in situations where escape is more difficult, fight or freeze behaviours may occur. Regarding public speaking, FFFS activation may occur when an individual perceives the distance from the threat to be minimal (e.g., they are standing on stage about to speak). This results in an urge to remove oneself from the situation (i.e., flight behaviour). However, when escape is not possible, they may freeze, potentially resulting in a performance catastrophe.

The BIS is responsible for the resolution of goal conflicts, is associated with anxiety, and is typically activated when threatening stimuli must be approached (e.g., a verbal presentation). Goal conflicts can occur from both between and within motivational systems (i.e., BAS vs. FFFS, BAS vs. BAS, FFFS vs. FFFS). To resolve concurrent goal conflicts, BIS activation results in the inhibition of conflicting behaviours, engagement of risk assessment processes, and the scanning of memory and the environment (Corr & Cooper, 2016). Furthermore, Corr and Cooper (2016) proposed there to be an optimal level of BIS activation, where excessive activation leads to risk aversion and generalised anxiety, whereas too little leads to risk proneness. Once the BIS is activated, it continues to exert control over

the individual until reappraisal shifts to BAS or FFFS dominance. This occurs by increasing the saliency of threatening stimuli (via recursive loops) until either the perception of danger has sufficiently increased (FFFS dominance), or the perception of danger has diminished (BAS dominance). In addition, Behnke and Sawyer (2001) argued that if a stressor (e.g., a threatening stimulus) is accompanied by repeated punishment (i.e., negative consequences), BIS sensitisation may occur, causing it to trigger at lower thresholds of threat. For example, if a person repeatedly receives negative consequences when delivering a verbal presentation, with each experience, lower levels of perceived threat are needed to elicit BIS activation.

Although not empirically tested in this thesis, it may be that public speaking anxiety (PSA) occurs when there is BIS activation, whereas fear of public speaking (FoPS) occurs when there is only FFFS activation. For example, when a person encounters a public speaking situation, one or more threatening stimuli will activate the FFFS (i.e., everyone watching, forgetting words), eliciting fear. If the same situation activates the BAS due to a potential motivating reward from speaking, (e.g., grade, job offer, or social status), then BIS activation will occur, resulting in anxiety instead. In certain instances, when there is no BAS activation (i.e., no motivation to move towards the threatening stimuli), only the FFFS will activate. Further, BIS activation can also occur when two equally threatening stimuli are present, causing avoidance-avoidance goal conflicts.

Definitions of PSA and FoPS

Research from Bodie (2010) and Gray and McNaughton (2000) may allow for new definitions in relation to public speaking anxiety (PSA) and fear of public speaking (FoPS). Considering this, PSA could be defined as “a situation-specific form of social anxiety that arises from actual, anticipated, or imagined delivery of a speech in front of others.” Whereas FoPS could be defined as “a situation-specific fear arising from actual delivery of a speech in front of others.” PSA can occur before and during an event, whereas FoPS can only occur during an event.

To distinguish it from other anxiety disorders, an audience must be considered (real or imagined). Consistent with current conceptualisations of anxiety and fear (Spielberger et al., 1983; Sylvers et al., 2011), we hypothesise PSA and FoPS to have both trait and state tendencies. Typically, those with trait PSA and/or FoPS are predisposed to respond to relatively unthreatening public speaking situations and stimuli with disproportionally high levels of state PSA and/or FoPS. Conversely, state PSA and FoPS are context-specific and can vary depending on situational factors. For example, a person may experience state PSA when they believe there are potential threats but are not too sure of their sources (e.g., the person is about to speak, and they are worried about what the audience's reaction will be). However, state FoPS would occur if the threat were real and in close proximity (e.g., the person cannot answer the question in front of everyone and now wants to escape). Both state and trait PSA and FoPS can be influenced by past or vicarious experiences.

Lang's (1968) tripartite model of fear is often used as a theoretical framework for the conceptualisation of PSA (Bodie, 2010). Based on this model, there is consensus among scholars that PSA consists of physiological (e.g., trembling), cognitive (e.g., self-doubt), and behavioural components (e.g., avoidance). However, as public speaking shares similar traits with sports (e.g., a skill that has to be performed and the presence of an audience), the authors thought it prudent to incorporate relevant sports psychology literature into their definition and reconceptualisation of PSA and FoPS.

Cheng et al.'s (2009) three-dimensional conceptualisation of performance anxiety is particularly relevant. Their conceptual model proposes performance anxiety to consist of three higher-order dimensions, comprising of five lower-order sub-components; cognitive anxiety (worry and self-focused attention); physiological anxiety (autonomic hyperactivity and somatic tension); and a regulatory dimension (perceived control). Expanding on their work, Jones et al. (2019) split the original unidimensional construct of 'self-focused

attention' into 'public self-focus' and 'private self-focus.' Table 1.3 contains construct definitions by Cheng et al. (2019) and Fenigstein et al. (1975).

Table 1.3

Construct Definitions for Dimensions of Performance Anxiety

Source	Construct	Definition
Cheng et al. (2019)	Worry	A cognitive form of apprehension associated with possible unfavourable outcomes.
Fenigstein et al. (1975)	Private Self-focus	Concern with attending to one's inner thoughts and feelings.
Fenigstein et al. (1975)	Public Self-Focus	An awareness of the self as a social object that has an effect on others.
Cheng et al. (2019)	Somatic Tension	Physiological reactions involved with the voluntary muscle groups that are motor-oriented.
Cheng et al. (2019)	Autonomic Hyperactivity	Physiological reactions involved with the involuntary muscles that are associated with the body's inner organs.
Cheng et al. (2019)	Perceived Control	Perception of one's capabilities (involving ability and resource) of being able to cope, and of goal-attainment, regarding the performance of a task under stress.

Incorporating this three-dimensional conceptualisation of performance anxiety, the authors propose that PSA and FoPS consist of cognitive (worry, public self-focus, and private self-focus), physiological (autonomic hyperactivity and somatic tension), and regulatory (perceived control) dimensions.

Threat Appraisals

As both PSA and FoPS relate to threat avoidance, it is important to discuss the appraisal process an individual undergoes when encountering potentially threatening stimuli. As public speaking is a highly stressful situation, several relevant theories are discussed in this section: cognitive appraisal theory (CAT; Lazarus & Folkman, 1984), Biopsychosocial model (BPSM) of challenge and threat (Blascovich, 2008), and the Theory of Challenge and Threat States in Athletes (TCTSA; Jones et al., 2009). According to Lazarus and Folkman (1984), several primary appraisals may occur when an individual encounters a potentially stressful situation or stimulus. The first revolves around assessing the damage that has already occurred (e.g., current harm or loss). The second focuses on the potential threats or

damages that may occur by remaining in this situation. The third centres upon challenge expectations which may lead the individual to remain in the situation because of potential benefits. However, when appraised as a stressful encounter, a secondary appraisal occurs. During this secondary appraisal, the individual compares the task demands (e.g., dangers, uncertainty, complexity of the task) against their perceived personal resources (e.g., coping skills, knowledge, external support). If an individual perceives sufficient (or nearly sufficient) resources to meet or exceed task demands, a challenge state occurs.

However, when demands outweigh resources, the situation is likely to be appraised as a threat (Seery, 2011). Seery (2011) argues that instead of dichotomous states, challenge and threat are anchor points on a continuum, with situations appraised as more or less of a challenge or threat. Novel situations and stressors increase the probability of threat appraisal because of the uncertainty of the resources needed to cope with task demands. Furthermore, cognitive biases can interfere with the appraisal process, either causing situations to be appraised as too demanding or negatively biasing perceived personal resources, or both.

The consensus among scholars is that primary appraisals occur predominantly unconsciously and automatically (Seery, 2011). By applying this theory to public speaking, unconscious primary appraisals should occur from the person who's task it is to speak. This appraisal will occur at the initial announcement of a public speaking task. If relevant, secondary appraisals will occur where the person will decide what resources they have at their disposal to deal with the upcoming situation. Task demands may include uncertainty, audience expectations, audience responses, and the effort (physical and vocal) required to deliver a dynamic presentation. Conversely, personal resources include previous experiences (linked to self-efficacy and masterful experiences), skill sets, and knowledge of the subject matter. In this instance, secondary appraisals occur by comparing task demands against personal resources.

During the secondary appraisal, individuals will also determine what they are going to do to cope with the situation. The most commonly used coping strategies are problem-focused, emotion-focused, avoidance, approach, and appraisal-focused (Nicholls & Polman, 2007). Problem-focused coping strategies aim to alter stressful situations by seeking information, problem-solving, and assertive confrontation (Compas et al., 2001). Conversely, emotion-focused coping strategies aim to reduce the emotional distress associated with a situation by seeking emotional support, relaxation, meditation, and wishful thinking (Lazarus & Folkman, 1984). Avoidance coping comprises behavioural (e.g., escape behaviour) and/or cognitive (e.g., psychological disengagement) techniques used to move away from a threat (Anshel et al., 2001; Roth & Cohen, 1986). Approach coping comprises behavioural and cognitive techniques (e.g., confrontation, problem solving, positive reappraisal) to move the person towards a threat (Roth & Cohen, 1986; Skinner et al., 2003). For example, in a public speaking situation, a person may utilise approach coping when interacting with the audience during a Q&A. However, if they are unable to answer questions, they may attempt to escape the situation by leaving the stage early (i.e., avoidance coping). Finally, appraisal-focused coping involves the appraisal and reappraisal of the situation to either reduce its saliency or alter the person's perspective towards it (Moos & Billings, 1982).

Previous research has found that those who employ emotion-focused and avoidance coping experience greater cognitive anxiety, while those who utilise problem-focused coping experience greater positive affect (Nicholls & Polman, 2007). Furthermore, in sports, ineffective coping leads to decreased performance and withdrawal (Klint et al., 1986; Lazarus, 2000). Although a full exploration of coping strategies is of interest in PSA research, it is beyond the scope of this thesis.

The Biopsychosocial model (BPSM) of challenge and threat (Blascovich 2008) was developed to determine whether an individual will perform effectively or ineffectively in motivated performance situations (MPS). As a public speaking experience could be

categorised as an MPS, it is worth exploring here. Blascovich defined a MPS as any situation where something is at risk and/or there is an incentive for the individual to strive for optimal performance. That is, the situation contains elements of reward (e.g., good grades) and consequences (e.g., loss of self-esteem). Although public speaking situations often have something at risk (e.g., social status) and something to strive for (e.g., reputation, grade, sale), individuals are often 'forced' to present in education and/or work settings with nothing to strive for (i.e., no motivation for increases in reputation, grades, or sales). Jones et al.'s (2009) TCTSA (an expansion of Blascovich's BPSM) suggests that self-efficacy, perceived control, and motivational goal types influence the perceived level of personal resources used in the appraisal process. Challenge states occur when there are higher levels of self-efficacy, perceived control, and utilisation of approach goals (i.e., BAS activation), whereas threat states are evoked when there are lower levels of self-efficacy and perceived control, and the use of avoidance goals.

A detailed discussion of the physiological and psychological markers associated with challenge and threat states is beyond the scope of this thesis. However, the authors considered it important to summarise some of the key findings. Threat states often result in greater muscular tension and impaired attentional control, with only negative emotions being experienced, which are likely to be interpreted as debilitative to performance (Jones et al., 2009; Skinner & Brewer, 2004; Wright & Kirby, 2003). Conversely, challenge states lead to enhanced attentional control, with both positive and negative emotions being experienced and interpreted as facilitative to performance (Jones et al., 2009; Skinner & Brewer, 2004). Incorporating this into the domain of public speaking, greater muscular tension leads to ineffective vocal and physical skills (Naqvi & Gupta, 2023; Thommessen & Fougner, 2020), while impaired attentional control leads to a focus on task-irrelevant cues (e.g., distractors), reducing performance (Eysenck et al., 2007).

In summary, the authors propose that transferring Gray and McNaughton's (2000) rRST to the domain of public speaking provides a potential solution to the ambiguity seen across the psychological literature on the conceptualisation of PSA and FoPS. The thesis keeps a critical eye on the terminology used throughout and uses the working definitions of public speaking, PSA, and FoPS stated above to reduce ambiguity and provide conceptual clarity.

Purpose of Thesis

Considering the limitations observed in the public speaking anxiety literature and the importance of public speaking in educational and occupational settings, this thesis has five main objectives. First, it aims to clarify the constructs of public speaking anxiety and fear of public speaking in a way that reduces ambiguity and provides conceptual clarity. The second purpose is to identify effective methodologies for the treatment of anxiety and fear of public speaking. The third purpose is to identify the limitations in the current assessment and treatment of public speaking anxiety. Fourth, to develop a valid and reliable measure for identifying public speaking threats. Finally, to design and evaluate the effectiveness of a novel intervention using acting and theatrical improvisation techniques aimed at reducing public speaking anxiety and increasing public speaking self-efficacy.

Thesis Format

The remainder of this thesis consists of three empirical chapters, comprising five studies, followed by a final general discussion chapter. Due to the dual needs of completing the thesis and submission to journals for publication, some repetition of content occurs. The remainder of this thesis is structured as follows:

1. Chapter 2 presents a systematic review and meta-analysis of the past 23 years of public speaking anxiety (PSA) interventions (n = 26). A critical narrative synthesis of interventions is presented, providing details of intervention variations in type,

duration, and focus. The strengths, limitations, and areas for future research are also discussed.

2. Chapter 3 presents three studies that assess the content and validity of a new assessment that identifies public speaking threats, the Public Speaking Threats Questionnaire (PSTQ). Study 1 focuses on the item development of the PSTQ, resulting in a three-factor model consisting of physiological arousal, self-perceptions, and external judgements. Study 2 examines construct validity using a larger, more heterogeneous sample. Finally, Study 3 examines test-rest reliability and predictive validity using a sample from a UK university.
3. Chapter 4 presents a pilot intervention examining the effects of a 12-hour training program aimed at reducing public speaking anxiety, while increasing public speaking self-efficacy. The Improv Self-Efficacy and Skills Program (ISESP) was conducted over a period of three weeks on a university sample.
4. Chapter 5 presents a general discussion of the thesis, including a summary of the findings, theoretical and applied implications, limitations, and future research directions.

References and appendices follow with tables and figures labelled cumulatively and separated by their respective chapters (for example Figure 4.5 denotes the fifth figure in Chapter 4).

Chapter 2: Public Speaking Anxiety - A Systematic Review and Meta-Analysis

Abstract

Public speaking can be a fear-inducing and anxiety-provoking experience for individuals, potentially resulting in poor performance and missed educational, social, and professional opportunities. To provide applied practitioners with effective methodologies for the reduction of public speaking anxiety (PSA), this paper aims to systematically review and meta-analyse theoretically driven interventions related to reducing PSA. Following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines, a systematic review and meta-analysis examined articles from 1st January 2000 to 1st June 2023. Of the 1,293 articles identified, 26 studies with 2,253 participants met the inclusion criteria. Research was of a moderate to high methodological standard, with interventions varying in type, duration, and focus (e.g., symptom vs. source). The overall effect of psychological interventions for PSA across 42 interventions was g = 1.17 (95% CI = 0.88 – 1.45), with high heterogeneity. While this review provides support for the efficacy of psychological interventions in reducing anxiety related to public speaking, rigorous research is warranted to examine long-term efficacy, real-world implications, self-efficacy development, and individual differences in treatment assignment.

Keywords: public speaking anxiety, fear of public speaking, communication apprehension, systematic review, meta-analysis

Note: This chapter is currently under review and may have subtle amendments between the current version and the publication of the thesis.

Introduction

"People fear public speaking more than death" is a phrase that has been quoted by numerous teachers, researchers, consultants, and countless textbooks ever since its first appearance in the London Sunday Times (see Watson, 1973, p. 9). The original research referenced found that out of 2,500 Americans surveyed, 41% reported their greatest fear was speaking before a group (Speech Communication Association, 1973). In replicating this research, Dwyer and Davidson (2012) found that 61% of college students reported speaking before a group was their most common fear. Marinho et al. (2017) conducted a similar study where 63.9% of undergraduate students reported a fear of public speaking and 89.3% desired classes to improve public speaking skills.

Perhaps somewhat confusingly, many labels have been used to describe performance anxiety related to public speaking, such as public speaking anxiety (Bodie, 2010), fear of public speaking (Blöte et al., 2009), communication apprehension (McCroskey, 1977), public speaking apprehension (Ayres & Ayres, 2000), stage fright (Jangir & Govinda, 2018), speech fright (Dwyer, 1998), and performance anxiety (Bögels et al., 2010). To avoid any further confusion, this article will use the term public speaking anxiety (PSA). We define PSA as "a situation-specific form of social anxiety that arises from actual, anticipated, or imagined delivery of a speech in front of others" (see Chapter 1).

Research has shown that PSA can lead to maladaptive tendencies, such as negative cognitive biases, avoidance, poor speech preparation, and dropout, resulting in missed educational, social, and professional opportunities (Bodie, 2010; Daly et al., 2009). In addition, several studies have found that PSA is a common characteristic of social anxiety disorder (SAD), and interventions targeting public speaking fears would help alleviate some of these maladaptive responses (Ruscio et al., 2008).

Review of Recent Meta-analyses

Recently, Ebrahimi et al. (2019) conducted a meta-analysis to examine the efficacy of psychological interventions for fear of public speaking (FoPS). Ebrahimi et al. found all interventions to be effective in reducing FoPS. However, their review had several limitations. First, only randomised controlled trials were evaluated (potentially missing effective studies). Second, their decision to search only four databases could have potentially missed studies of worth. Third, Ebrahimi et al.'s work lacked a narrative synthesis of studies (e.g., intervention type and theoretical frameworks). Therefore, without a narrative synthesis, it is difficult for an applied practitioner to determine the variables that may have led to treatment efficacy.

A related systematic review and meta-analysis by Horigome et al. (2020) examined the effects of virtual reality exposure therapies (VRET) on SAD, FoPS, and PSA. Horigome et al. found that VRET was an acceptable treatment option, demonstrating significant long-lasting efficacy. While their report included eight studies that focused on PSA and FoPS reduction, their analysis only concentrated on the generalised effects of interventions on SAD. The authors also excluded studies in which VRET was conducted for fewer than three sessions (hence, ignoring single-session interventions covered in this review).

Finally, Reeves et al. (2022) conducted a meta-analysis to investigate the efficacy of VRET and in vivo exposure therapies for PSA. They found that both therapies were effective, with in vivo marginally more efficacious. Although their results support Horigome et al.'s (2020) findings, their research has some limitations. First, they only included studies in which participants had significantly elevated clinical levels of PSA (hence, ignoring more normal populations). Second, four out of 11 studies (36%) were published between 1978 and 1997 and could be considered outdated due to advances in quality and reporting in recent years. Third, Reeves et al. lacked narrative synthesis (see also Ebrahimi et al., 2019).

In the present authors' view, if practitioners can easily identify effective treatments and their methodologies, they will be in a far better place to develop, deliver, and assess their

own interventions moving forward. Therefore, the present study provides a detailed critical narrative synthesis and meta-analysis of interventions aimed at reducing PSA.

Research Aims

The present study had three main aims: (1) to identify current psychological interventions available for the reduction of PSA; (2) to examine, compare, and assess the efficacy of psychological interventions against credible control groups; and (3) to provide a critical narrative synthesis of interventions to aid applied practitioners in the selection and delivery of treatments.

Method

Following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA; Moher et al., 2009), a final electronic search was conducted in June 2023 using the following databases: Social Science Premium Collection, SciTech Premium Collection, Publicly Available Content, APA PsychInfo, British Nursing, Arts and Humanities, Literature Online (via the ProQuest platform), PubMed, Wiley, Taylor and Francis, JSTOR, Cochrane Library, and SAGE. The first author initially read and checked all titles and abstracts against the eligibility and exclusion criteria listed below. Full-text articles were screened if their information was unclear. The following search terms were used to identify empirical research on psychological interventions for public speaking anxiety: (“public speaking anxiety” OR “public speaking fear” OR “fear of public speaking”) AND (“intervention” OR “program*” OR “treat*” OR “measure” OR “outcome” OR “evaluation”). Full-text database searches for keywords were performed to ensure the inclusion of all relevant articles. The first author followed up the database searches with backward and forward reference searches to identify further relevant articles.

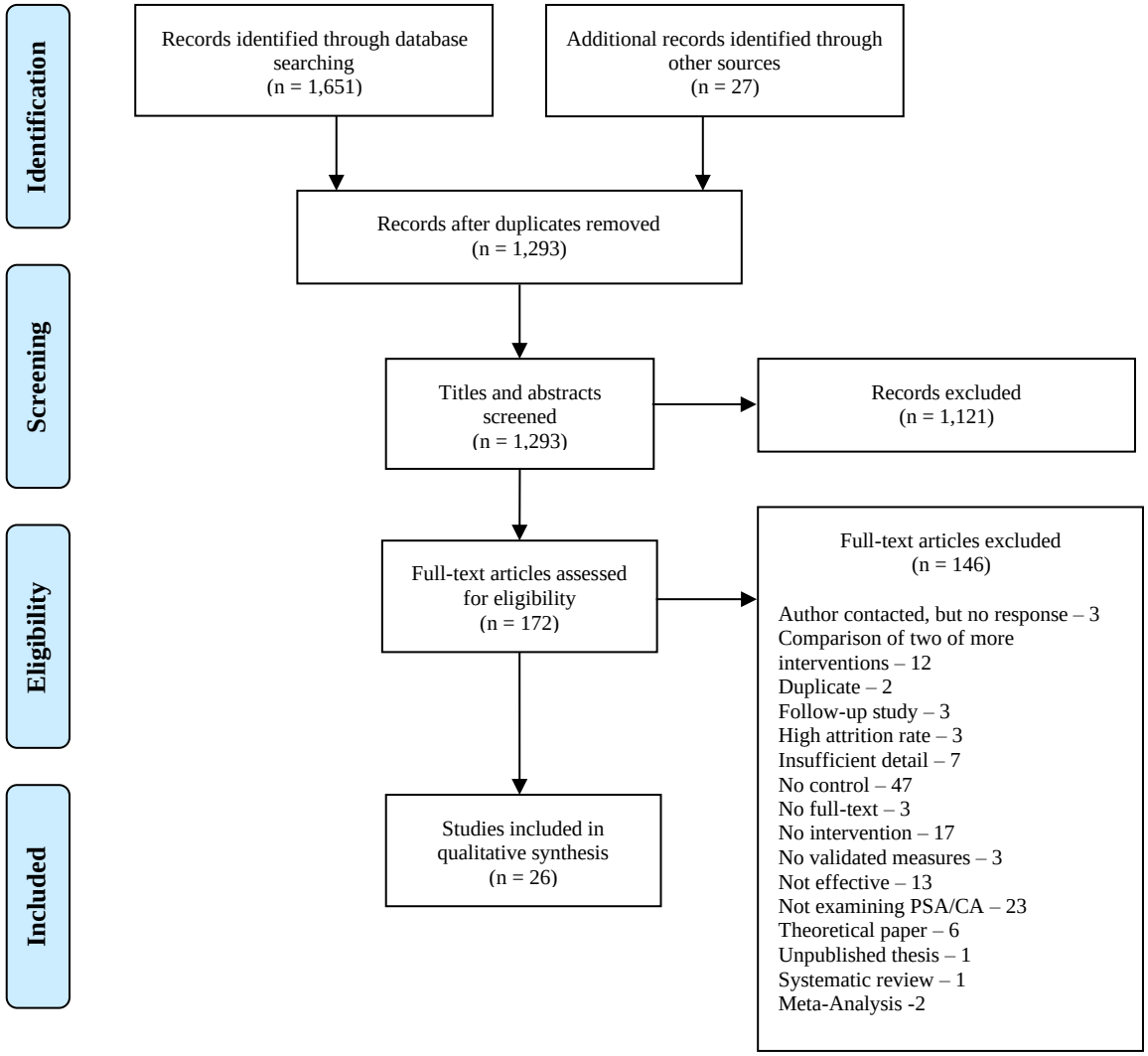
Inclusion and Exclusion Criteria

Studies included in the review were required to meet the following selection criteria: (1) psychological interventions for PSA that measured psychological change or targeted

specific psychological variables; (2) written in the English language; (3) peer-reviewed; (4) included a control group; (5) significantly reduced the amount of anxiety experienced and/or improved/maintained performance; and (6) published since 2000. Studies were excluded from the review based on the following criteria: (1) abstract only/no full-text available; (2) high attrition rate (40% or higher); and (3) lack of validated measures (e.g., no evidence of content- and/or criterion-related validity). Figure 2.1 shows the PRISMA flow chart detailing the review and selection process of the papers for inclusion in the review.

Figure 2.1

PRISMA Flow Chart



Assessment of Study Quality

To assess the quality of the studies meeting the inclusion criteria in this systematic review, the first author opted to use the 16-item quality assessment tool and scoring guidance (QATSDD; Sirriyeh et al., 2012). As two qualitative-only assessment criteria were irrelevant to this review, the first author decided to omit them. The QATSDD contains a list of criteria for studies rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*completed*). Division of the total score for each study by the maximum possible score resulted in an overall quality percentage. The first author performed the initial quality assessment, and the second author independently assessed a random 30% of the data. Inter-rater reliability was within a 3% margin, indicating an almost perfect agreement (Landis & Koch, 1977). Where discrepancies occurred between coders, scores were discussed before reaching a consensus. See Table 2.1 for a breakdown of the quality assessment scores.

Table 2.1

Quality Assessment Scores

Article	Items														Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Raw	%
Abrams et al. (2001)	3	3	2	0	0	3	2	3	3	2	2	3	0	2	28	67%
Amir et al. (2008)	3	3	1	0	1	2	1	2	1	2	3	2	0	0	21	50%
Aslani et al. (2014)	3	3	3	0	1	2	0	2	0	2	3	2	0	0	21	50%
Ayres and Ayres (2003)	3	3	2	0	1	2	2	1	3	3	3	2	0	0	25	60%
Ayres and Heuett (2000)	3	3	2	0	1	3	2	3	2	3	3	2	0	0	27	64%
Ayres and Schliesman (2002)	3	3	2	0	1	2	1	2	3	3	2	3	0	0	25	60%
Ayres, Hopf, and Peterson (2000)	3	3	2	0	1	1	3	1	0	3	2	1	0	0	20	48%
Ayres, Hopf, and Will (2000)	3	2	1	0	0	1	3	2	2	3	3	2	0	2	24	57%
Azevedo et al. (2017)	3	3	0	0	0	3	0	1	0	3	3	0	0	2	18	43%
Brandrick et al. (2020)	3	3	2	0	1	3	2	3	2	3	3	3	0	1	29	69%
Buttelmann and Römpke (2014)	2	3	2	0	1	2	3	2	2	3	3	0	0	1	24	57%
Choi et al. (2015)	2	3	2	0	1	2	1	2	3	2	3	2	0	0	23	55%
Cunningham et al. (2006)	3	1	3	0	1	2	1	2	3	2	3	1	0	0	22	52%
Dİncer et al. (2022)	3	3	3	3	2	3	1	3	3	3	3	3	0	2	35	83%
Dwyer (2000)	3	3	2	0	2	1	3	1	1	2	3	2	0	0	23	55%
Finn et al. (2009)	3	3	3	0	2	1	2	1	3	3	3	3	0	2	29	69%
Fitch et al. (2011)	3	3	3	0	0	2	1	2	3	2	2	2	0	0	23	55%
Heuett and Heuett (2011)	0	3	1	0	1	3	1	2	3	2	3	3	0	0	22	52%
Heuett et al. (2003)	3	3	2	0	1	3	3	2	3	3	2	2	0	0	27	64%
Jackson et al. (2017)	3	3	3	2	2	3	3	3	3	3	3	3	0	3	37	88%
Jangir and Govinda (2018)	3	1	3	0	0	1	0	0	0	2	2	0	0	0	12	29%
Lin et al. (2019)	2	3	2	3	0	2	2	2	3	2	3	2	0	1	27	64%
Pribyl et al. (2001)	3	3	2	0	1	2	0	3	0	2	2	0	0	0	18	43%
Reeves et al. (2021)	3	3	3	0	1	2	1	3	2	3	2	2	0	1	26	62%
Tillfors et al. (2011)	0	3	3	0	2	2	2	3	3	3	2	3	0	1	27	74%
Wallach et al. (2009)	1	3	2	0	1	2	1	2	3	3	3	2	0	3	26	62%
Item percentage (0)	7.7	0.0	3.8	88.5	23.1	0.0	15.4	3.8	19.2	0.0	0.0	15.4	100.0	53.8		
Item percentage (1)	3.8	7.7	11.5	0.0	57.7	19.2	34.6	19.2	7.7	0.0	0.0	7.7	0.0	19.2		
Item percentage (2)	11.5	3.8	50.0	3.8	19.2	50.0	26.9	46.2	19.2	42.3	34.6	46.2	0.0	19.2		
Item percentage (3)	76.9	88.5	34.6	7.7	0.0	30.8	23.1	30.8	53.8	57.7	65.4	30.8	0.0	7.7		
Average total score															25	59%

Note: 0 = not at all; 1 = very slightly; 2 = moderately; 3 = complete

Results

Search Result

The database search identified 1,651 records. Forward and backward reference searches identified a further 27 records. After removing duplicates 1,293 titles and abstracts were identified. These titles and abstracts were examined against the inclusion and exclusion criteria, resulting in 172 papers identified for full-text review. A final list of 26 articles were identified as appropriate for the review. Table 2.2 summarises the 26 studies included in this review.

Quality Assessment

The quality assessment results ranged from 29-88%, with a mean score of 59% (see Table 2.2). Two papers scored in the very high methodological quality range (81-100%); nine scored high (61-80%); 14 moderate (41-60%); and one low (21-40%). Overall, the studies scored highly in terms of theoretical framework, study objectives, and method of analysis. The lowest scoring item was *"Evidence of user involvement in design"* which no paper mentioned at all. *"Evidence of sample size considered"* was only achieved in three studies (11.5%) and no paper achieved a "complete" score for *"Representative sample of target group of a reasonable size."*

Country of Origin

This review found that 14 studies originated from the US, three from the UK, and one each from India, Japan, Israel, Sweden, Iran, Germany, Australia, Singapore, and Turkey (see Table 2.2, Column 1).

Settings

Twenty of the studies were based in universities. One study was conducted in a high school (Tillfors et al., 2011), one examined social drinkers in the Minneapolis / Saint Paul metro area (Abrams et al., 2001), one focused on Toastmaster groups near a large

metropolitan western city (Cunningham et al., 2006), and three failed to say where they were set (Azevedo et al., 2017; Lin et al., 2019; Wallach et al., 2009).

Table 2.2

Summary of Reviewed Studies

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
Abrams et al. (2001) US	Sample size *Total sample size n = 61* M = 24; F = 37 Intervention *41* Control *20*	Mean age (*SD*) *32.2 (SD = 9); Age Range 21-55* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	STAI-S; AAS; VASs; HR	Random	45m	2h 15m	Speech topics were taken from *The book of questions* (Stock, 1985) and were on a different moral dilemma. One at pre-test, one at post-test. Audience of approximately six people.	67%
Amir et al. (2008) US	Sample size *Total sample size n = 94* M = 46; F = 48 Intervention *M = 24; F = 23* Control *M = 22; F = 25*	Mean age (*SD*) *Missing data* *19 (SD = 1.9)* *19 (SD = 1.2)*	Ethnicity *Missing data* *Missing data* *Missing data*	STAI-T; LSAS-SR; BDI-II	Random	*Missing data*	*Missing data*	Post-test only: impromptu speech (with two minutes of preparation) on one of five topics (abortion, corporal punishment, seatbelt laws, nuclear power, or the American health system). Speeches were delivered to a video camera and lasted, on average, three minutes.	50%
Aslani et al. (2014) Iran	Sample size *Total sample size n = 30* Intervention *M = 0; F = 15* Control *M = 0; F = 15*	Mean age (*SD*) *Age Range 19-25* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	PRCS; S-R Inventory	Random	7 individual sessions of 90 minutes each	*Missing data*	No public speaking component.	50%
Ayres and Ayres (2003)	Sample size *Total sample size n = 90*	Mean age (*SD*) *19.3 (SD - Missing data)*	Ethnicity *Missing data*	PRCA; STAI	Random	15m	1d	Speech topics were "*What I expect to get out of college"* or "*What I expect to do in the future."* Half of the	60%

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
US	M = 44; F = 46 Intervention *72* Control *18*	*Missing data* *Missing data*	*Missing data* *Missing data*					participants spoke on one topic at pre-test and the other topic at post-test. Audience of three to four people.	
Ayres and Heuett (2000) US	Sample size *Total sample size n = 50* M = 20; F = 30 Intervention *33* Control *17*	Mean age (*SD*) *19.4 (SD - Missing data)* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	PRCA; STAI	Random	One-off 30-minute treatment	14w	Speech topics were "*What I expect to get out of college"* or "*What I expect to do in the future."* Half of the participants spoke on one topic at pre-test and the other topic at post-test. Audience of two to five people.	64%
Ayres and Schliesman (2002) US	Sample size *Total sample size n = 40* M = 23; F = 17 Intervention *Missing data* Control *Missing data*	Mean age (*SD*) *21.4 (SD - Missing data)* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	PRCA; STAI	Random	20m	1d	Speech topics were "*What I expect to get out of college"* or "*What I expect to do in the future."* Half of the participants spoke on one topic at pre-test and the other topic at post-test. Audience of two to five people.	60%
Ayres, Hopf, and Peterson (2000)	Sample size *Total sample size n = 136*	Mean age (*SD*) *19.4 (SD - Missing data); Age range 18-52*	Ethnicity *Missing data*	PRCA; STAI (5-item); WTC; SPCC	Random	1 week *(however no explanation of how much time during the week)*	1w	Speech topics were "*What I expect to get out of school"* or "*What I expect to do after I finish school."* All treatment participants spoke on one topic pre-test and the other post-test.	48%

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
US	Intervention							The audience size ranged between four and eight people	
	Missing data	*Missing data*	*Missing data*						
	Control								
	Missing data	*Missing data*	*Missing data*						
Ayres, Hopf, and Will	Sample size	Mean age (*SD*)	Ethnicity	The Stroop Test; PRCA; STAI	Random	20m	1h	Speech topics were "*What I expect to get out of school"* and *"What I expect to do after I finish school."* Half of the participants spoke on one topic at pre-test and the other topic at post-test. No details of the audience were given.	57%
(2000)	*Total sample size n = 80*	*19.2 (SD - Missing data); Age Range 18-48 - *Only for pre-test of 2,807 not final sample*	*Missing data*						
US	Intervention								
	40	*Missing data*	*Missing data*						
	Control								
	40	*Missing data*	*Missing data*						
Azevedo et al.	Sample size	Mean age (*SD*)	Ethnicity	HR; Skin conductance; STAI-Y-1; bFNE	Random	5m	1d	Speech topic was *"the use of animals for research."* Participants had five minutes to prepare a five-minute speech to an audience of three to four colleagues of the researcher. Speeches were never delivered.	43%
(2017)	*Total sample size n = 52*	*26.4 (SD = 5.7)*	*Missing data*						
UK	Intervention								
	M = 9; F = 16	*25.9 (SD = 5.2)*	*Missing data*						
	Control								
	M = 11; F = 16	*26.8 (SD = 6.1)*	*Missing data*						
Brandrick et al.	Sample size	Mean age (*SD*)	Ethnicity	BAT; PRPSA; SUDs	Missing data	30s	1d	Post-test only. An impromptu speech on a randomly selected topic *"your dream job."* Audience of one researcher.	69%
(2020)	*Total sample size n = 63*	*25.7 (SD = 9.48); Age Range 19-56*	*Missing data*						
UK	M = 17; F = 46								
	Intervention								

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
	42	*Missing data*	*Missing data*						
	Control								
	21	*Missing data*	*Missing data*						
Buttelmann and Römpke	Sample size	Mean age (*SD*)	Ethnicity	STAI; AAS; PAS; PlantAS	Measurement scores	5m	1d	Post-test only. Speech topics were a) Literature ("The significance of Friedrich Schiller in Weimar Classicism"), b) Politics ("Michail Gorbatschow and his role in the Cold War"), and c) Science ("The chemical and physical background to global warming"). Topics were preselected by the experimenter in a way that excluded the preferred topic participants gave in the demographic questionnaire. Five minutes preparation was time given. Audience of a camera with a live connection to the adjacent room.	57%
(2014)	*Total sample size n = 71*	*22.5 (SD - Missing data); Age Range 18.8-29.8*	*Missing data*						
Germany	M = 6; F = 65								
	Intervention								
	53	*Missing data*	*Missing data*						
	Control								
	18	*Missing data*	*Missing data*						
Choi et al.	Sample size	Mean age (*SD*)	Ethnicity	PRCA-24	Random	8m	1d	Predetermined speech topic pertinent to the university was used. Intervention group participants were given four minutes preparation, control group were given a distractor task. Both groups received the same set of predetermined notes to use in their delivery. No details of audience given.	55%
(2015)	*Total sample size n = 95*	*20 (SD = 1.61); Age Range 18-25*	*Missing data*						
US	M = 49; F = 46								
	Intervention								
	48	*Missing data*	*Missing data*						
	Control								
	47	*Missing data*	*Missing data*						
Cunningham et al.	Sample size	Mean age (*SD*)	Ethnicity	SRP; SUBSS; PRCS	Random	2-5 sessions (average 3.3) 1hr each	*Missing data*	No public speaking component was administered by the researchers; however, participants did undertake one before submitting post-test scores	52%
(2006)	*Total sample size n = 36*	*Missing data*	*Missing data*						
US	Intervention								
	17	*Missing data*	*Missing data*						
	Control								

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
	19	*Missing data*	*Missing data*						
Dİncer et al. (2022) Turkey	Sample size *Total sample size n = 78* Intervention *51* Control *25*	Mean age (*SD*) *Missing data* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	SUDs; STAI-TX1; STAI-TX 2; SAS	Random	20m	1d	Post-test only. Speech topic was *"Prevention of chronic diseases within the scope of chronic diseases course."* No details on preparation or duration of speeches. Audience was of the general public, but no other details were given.	83%
Dwyer (2000) US	Sample size *Total sample size n = 331* Intervention *202* Control *129*	Mean age (*SD*) *Age Range 17-52* *Missing data* *Missing data*	Ethnicity *Missing data* *Missing data* *Missing data*	PRCA-24	Self-Selection	3w	15w	No public speaking component.	55%
Finn et al. (2009) US	Sample size *Total sample size n = 140* M = 60; F = 80 Intervention *Missing data*	Mean age (*SD*) *19.08 (SD = 1.4); Age Range 18-29* *Missing data*	Ethnicity *Missing data* *Missing data*	PRCA-24; A-STAI	Cluster Randomised	*Missing data*	Up to 15-17 weeks (1 US semester)	Informative speech at pre-test; persuasive speech at post-test. Each speech lasted five minutes. Audience of 20-25 peers and the course instructor.	69%

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
	Control								
	Missing data	*Missing data*	*Missing data*						
Fitch et al.	Sample size	Mean age (*SD*)	Ethnicity	PRPSA; CAI State	Self-selection	Until SUDS rating was significantly reduced, or 20 minutes had passed	1d	Both pre-and post-test speeches were given but no information about the topic, duration, or audience was given.	55%
(2011)	*Total sample size n = 67*	*Missing data*	*Missing data*						
US	Intervention								
	14	*Missing data*	*Missing data*						
	Control								
	53	*Missing data*	*Missing data*						
Heuett and Heuett	Sample size	Mean age (*SD*)	Ethnicity	PRCA; STAI; WTC; SPCC	Random	10-20mins	1w	Impromptu speech topics were "*What I expect to get out of college"* and *"What I expect to do after college."* Half of the participants spoke on one topic at pre-test and the other topic at post-test. No details of audience given.	52%
(2011)	*Total sample size n = 80*	*20.1 (SD - Missing data); Age Range 18-26*	*Missing data*						
US	M = 33; F = 47								
	Intervention								
	80	*Missing data*	*Missing data*						
	Control								
	40	*Missing data*	*Missing data*						
Heuett et al.	Sample size	Mean age (*SD*)	Ethnicity	PRCA; STAI; WTC; SPCC; PCS	Paired comparison score	20-40 minutes	1d	Impromptu speech topics were "*What I expect to get out of college"* and *"What I expect to do after college."* Half of the participants spoke on one topic at pre-test and the other topic at post-test. No details of audience were given.	64%
(2003)	*Total sample size n = 72*	*20.8 (SD - Missing data)*	*Missing data*						
US	Intervention								
	60	*Missing data*	*Missing data*						
	Control								
	12	*Missing data*	*Missing data*						

Author, year, location	**Participant information** **M = Male; F = Female**			**Psychological measures utilised**	**Treatment assignment**	**Duration of treatment(s)**	**Duration of study**	**Description of public speaking format**	**Quality score (0-100%)**
Jackson et al.	Sample size	Mean age (*SD*)	Ethnicity	BFI-10; Perceived threat; Task importance; Social anxiety; Task-related anxiety; Self-efficacy, SAS-2; Interpretation of anxiety; Impact of message; SPSS	Cluster Randomised	2w	2w	No details of speech topics or preparation time were given. Each person presented for approximately eight minutes (as part of a 30-minute group presentation). Audience of approximately 20 classmates.	88%
(2017)	*Total sample size n = 230*	*20.14 (SD = 2.72)*	*Missing data*						
Australia	Intervention								
	M = 50; F = 52	*20.41 (SD = 3.23)*	*Missing data*						
	Control								
	M = 60; F = 68	*19.92 (SD = 2.22)*	*Missing data*						
Jangir and Govinda	Sample size	Mean age (*SD*)	Ethnicity	PRPSA; RSE; SUDs	Missing data	6w	6w	No public speaking component.	29%
(2018)	*Total sample size n = 40*	*Missing data*	*Missing data*						
India	Intervention								
	Missing data	*Missing data*	*Missing data*						
	Control								
	Missing data	*Missing data*	*Missing data*						
Lin et al.	Sample size	Mean age (*SD*)	Ethnicity	LSAS; PSAS; FNE-B; SSPS	Random	4 weekly sessions, each lasting approximately 60 minutes.	10w	No public speaking component.	64%
(2019)	*Total sample size n = 50*	*25.6 (SD = 3.96)*	*84% Chinese; 16% Other*						
Singapore	Intervention								
	M = 8; F = 17	*24.2 (SD = 3.23)*	*80% Chinese; 20% Other*						
	Control								
	M = 5; F = 20	*27 (SD = 4.19)*	*88% Chinese; 12% Other*						

Author, year, location	**Participant information M = Male; F = Female**			**Psychological measures utilised**	**Treatment assignment**	**Duration of treatment(s)**	**Duration of study**	**Description of public speaking format**	**Quality score (0-100%)**
Pribyl et al.	Sample size	Mean age (*SD*)	Ethnicity	PRPSA	Self-selection	45 hours	1 year	No public speaking component.	43%
(2001)	*Total sample size n = 111*	*Missing data*	*Missing data*						
Japan	Intervention								
	M = 3; F = 22	*Missing data*	*Missing data*						
	Control								
	M = 24; F = 62	*Missing data*	*Missing data*						
Reeves et al.	Sample size	Mean age (*SD*)	Ethnicity	PSAS; LSAS-SR; FNE-B; IPQ	Random	*Missing data*	4w	Intervention group only. Pre- and post-test. Two minutes to prepare a speech on between one and three speech topics taking from a list of five controversial topics (e.g., nuclear power, Brexit, death penalty). Speeches lasted between four and fifteen minutes but were advised they could stop at any time. Audience of one researcher	62%
(2021)	*Total sample size n = 51*	*26 (SD = 7.53)*	98% White; 2% Black						
	Intervention								
UK	*M = 2; F = 31*	(1) 27.40 (*SD* = 9.25); (2) 26.60 (*SD* = 6.79)	*Missing data*						
	Control								
	M = 1; F = 17	*24.17 (SD = 6.53)*	*Missing data*						
Tillfors et al.	Sample size	Mean age (*SD*)	Ethnicity	SPSQ-C; LSAS-SR; BAI; MADRS-S; QOLI	Random	9w	9 weeks + follow-up 1 year	No public speaking component.	64%
(2011)	*Total sample size n = 19*	*16.5 (SD = 1.6); Age Range 15-21*	*Missing data*						
Sweden	Intervention								
	10	*Missing data*	*Missing data*						
	Control								
	9	*Missing data*	*Missing data*						
Wallach et al.	Sample size	Mean age (*SD*)	Ethnicity	LSAS; SSPS; FNE; Behavioural Task	Random	12h	12w	Post-test only. Participants presented a 10-minute talk (standing and without notes) on a topic of their	62%
(2009)	*Total sample size n = 88*	*Missing data*	*Missing data*						

Author, year, location	Participant information M = Male; F = Female			Psychological measures utilised	Treatment assignment	Duration of treatment(s)	Duration of study	Description of public speaking format	Quality score (0-100%)
Israel	Intervention							choice. Audience of four to five members of staff.	
	M = 11; F = 47	*(1) 28.18 (SD = 7.97); (2) 28.59 (SD = 8.08)*	*Missing data*						
	Control								
	M = 9; F = 21	*25.29 (SD = 2.62)*	*Missing data*						

A-STAI - A-State version of the State-Trait Anxiety Inventory (Spielberger, et al., 1970); AAS - Audience Anxiousness Scale (Leary, 1983a); ANB - Alternate Nostril Breathing (Kamath et al., 2017); BAI - Beck Anxiety Inventory (Beck et al., 1988); BAT - Behavioral Assessment Test (Clark et al., 1997), BFI-10 - Brief version of the Big Five Inventory (Rammstedt & John, 2007); bFNE - Brief Fear of Negative Evaluation Questionnaire (Leary, 1983b); CAI State - Communication Anxiety Inventory Form State (Booth-Butterfield & Gould, 1986); FNE - Fear of Negative Evaluation Scale (Watson & Friend, 1969); FQ - Fear Questionnaire (Marks & Matthews, 1979); HR - Heart Rate; The Igroup Presence Questionnaire (IPQ) (Schubert et al., 2001); LSAS - Liebowitz Social Anxiety Scale (Liebowitz, 1987); LSAS-SR - Liebowitz Social Anxiety Scale self-report (Baker et al., 2002); MADRS-S - Montgomery–Åsberg Depression Rating Scale (Svanborg & Asberg, 1994); PAS - Pet Attitude Scale (Templer et al. 1981); PCS - Paired Comparison Survey (Heuett et al., 2003); PlantAS - Plant Attitude Scale (Buttelmann & Römpke, 2014); PRCA - The Personal Report of Communication Apprehension (McCroskey, 1997); PRCA-24 - The Personal Report of Communication Apprehension (Levine & McCroskey, 1990;); PRCS - Personal Report of Confidence as a Speaker (Paul, 1966); PRPSA - The Personal Report of Public Speaking Anxiety (McCroskey, 1970); PSAS - Public Speaking Anxiety Scale (Bartholomay & Houlihan, 2016); QOLI - Quality of Life Inventory (Frisch et al., 1992); RSE - Rosenberg Self-Esteem Scale (Rosenberg, 1965); SAS - Speech Anxiety Scale (Yaman & Suroglu Sofu (2013); SAS-2 - Sport Anxiety Scale-2 (Smith et al., 2006); SII - Survey of Imagined Interactions (Honeycutt, 2010); SPCC - The Self-Perceived Communication Competence scale (McCroskey & McCroskey, 1988); SPS - Social Phobia Scale (Mattick & Clarke, 1998); SPSQ-C - Social Phobia Screening Questionnaire for Children & adolescents (Gren-Landell et al, 2009); S-R Inventory – Stimulus-Response Inventory (Endler et al., 1962); SRP - Self-rated Performance (Cunningham et al., 2006); SSPS - Self-Statements during Public Speaking scale (Hofmann & Dibartolo, 2000); Stroop Test (Mandeville et al. 1994); STAI - The State Trait Anxiety Inventory (Spielberger et al., 1970); STAI-S - The State form of the State-Trait Anxiety Inventory (Spielberger et al., 1983); STAI-Y-1 - State-Trait Anxiety Inventory (Spielberger, et al., 1970); SUBSS - Subjective Units of Bothersome Sensations Scale (Cunningham et al., 2006); SUDs - Subjective Unit of Distress Scale (Wolpe, 1969); VAMS - Visual Analogue Mood Scale (Norris, 1971); VASs - Visual Analogue Scales (Abrams et al., 2001); WTC - The Willingness to Communicate Scale (McCroskey & Richmond, 1991).

1

Population

A total of 2,253 participants, with 1,053 intervention participants and 844 control participants took part across the 26 studies. Four studies failed to report a breakdown of participants between the intervention and control groups, resulting in missing data for 356 participants. 16 studies included data on both genders of which 515 were male and 916 females. One study contained female-only participants (n = 30; Aslani et al., 2014), and nine studies failed to report a gender split, leading to missing data regarding gender for 823 participants. Across all studies, ages ranged from 15 to 56 years. 25 studies focused solely on an adult population, while one study examined young people aged between 15 and 21 years (Tillfors et al., 2011). Only five studies reported the ages of both the intervention and control groups. The average age was 24.38 years (SD = 3.33) and 23.60 years (SD = 3.31) for the intervention and control groups respectively. Five studies failed to report any data related to participant age (see Table 2.2, Column 2).

Ethnicity

Of the 26 studies included in this review, only two recorded any information on participant ethnicity (Lin et al., 2019, 84% Chinese and 16% Other; Reeves et al., 2021, 98% White and 2% Black).

Treatment Assignment

Of the studies identified, 17 randomly assigned participants to the intervention and control groups, three used self-selection methods, two used cluster randomisation, two used measurement scores, and two studies had missing data (see Table 2.2, Column 4).

Public Speaking Component

Only 11 studies featured a public speaking component in both the pre-and post-test and nine studies utilised the post-test only. The remaining six studies did not feature any public speaking elements (Aslani et al., 2014; Dwyer, 2000; Jangir & Govinda, 2018; Lin et

al., 2018; Pribyl et al., 2001; Tillfors et al., 2011). Topics, formats, and audience sizes varied from study to study (see Table 2.2, Column 7).

Pre- and Post-Measures

All studies in this review used pre- and post-self-report measures. However, five studies included additional measurements alongside self-report anxiety. For example, one study used a Stroop Test (Ayres, Hopf, & Will, 2000), two studies used heart rate monitoring (Abrams et al., 2001; Azevedo et al., 2017), one used skin conductance (Azevedo et al., 2017), one employed observer ratings (Wallach et al., 2009), and one used both an attention bias assessment task and observer ratings (Amir et al., 2008). Of the self-report measures used, eight used both the Personal Report of Communication Apprehension (PRCA; McCroskey, 1982) and the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970), two used the PRCA only, and five used the STAI only (see Table 2.2, Column 3).

Intervention Duration

Across the 26 studies, the shortest treatment lasted 30 seconds (Brandrick et al., 2020), whereas the longest took 45 hours to complete over the course of a year (Pribyl et al., 2001; see Table 2.2, Column 5).

Intervention Type and Efficacy

Intervention type, content, delivery, and efficacy varied greatly across the 26 studies. First, we discuss studies that utilised exposure-based strategies (e.g., treatments that offer participants opportunities to confront their fear of public speaking). Second, we report studies that used cognitive modification strategies (i.e., treatments that aim to alter maladaptive thought processes). Third, we review studies that use a combination of both strategies, and the fourth section reports on studies that use a range of alternative strategies. Finally, we conduct a meta-analysis to compare the effect sizes of studies with sufficient data.

Exposure-based Interventions

Ayres and Heuett (2000) examined the effects of performance visualisation on reducing communication apprehension (CA). The intervention group received a 30-minute performance visualisation treatment which involved relaxation, watching a videotape of a speaker, imagining the speaker on-demand, and then imagining themselves as the speaker. After post-test speeches were delivered (14 weeks later), the intervention group depicted themselves as more positive, vivid, in control, and reported significantly lower state and trait CA compared to placebo and control groups.

Ayres and Ayres (2003) explored the impact of visualisation therapies (i.e., visualisation scripts and drawings) on reducing PSA. The script-only group followed a visualisation script. The drawings-only group looked at a set of sketches that illustrated an individual going through the events outlined in the visualisation script. Individuals in the combined script and drawings group listened to the visualisation script and followed a set of drawings. The placebo group read material on general communication processes and the control group was left to their own devices for 15 minutes. After a post-test speech, the results showed that while all visualisation conditions reported a significant reduction in PSA compared with the placebo and control conditions, the combined script and drawing condition was the most effective. Further, individuals in the combined text and drawings group envisioned themselves as speakers, having more control and being more positive compared to other conditions.

Heuett and Heuett (2011) investigated the use of virtual reality therapy (VRT) to reduce self-reported measures of PSA compared to a visualisation and control group. Participants in the VRT condition wore a head-mounted display (which also transmitted the sound of their own voice), which enabled them to enter a computer-generated version of an auditorium. Visualisation participants watched a videotape guiding them through their treatment (see Ayres et al., 1993). While both treatments significantly reduced trait and state

CA and increased self-perceived communication competence (SPCC) compared with the control group after post-test speeches, only the VRT condition reported a significant increase in willingness to communicate (WTC). Furthermore, VRT was significantly more effective at reducing trait and state CA and increasing SPCC and WTC compared to the visualisation-only group.

The final study to use a visualisation strategy investigated the effects of imagined interactions and rehearsal on speaking performance (Choi et al., 2015). Participants in the intervention group listened to a 4-minute training session that included the definition, benefits, examples, and procedural steps of imagined interactions (see Edwards et al., 1988). Rehearsal techniques included repetition and imagining the successful outcome of a speech (i.e., positive audience reaction and feedback). After completing the one-off training session, the intervention group were given four minutes to read over and prepare a speech on a predetermined topic. The control group were given a distractor task to ensure that no rehearsal took place before delivering their speech. After the post-test speech, the intervention group had significantly fewer silent pauses and a significantly shorter duration of combined disfluencies compared to the control group. However, there was no significant difference in vocalised pauses between groups.

Reeves et al. (2021) explored whether 360° video content influences virtual reality exposure therapy (VRET) outcomes. Participants were split into 360°Audience, 360°Empty, and control groups. Both intervention groups received VRET weekly for four weeks. The 360°Audience participants were gradually exposed to increased room and audience sizes, and the 360°Empty condition increased the room size only. The control group received no treatment and only completed the outcome measures online, weekly. Post-test scores for all groups were completed after the final public speaking task from the intervention groups. The results showed that both 360°Audience and 360°Empty demonstrated a significant reduction

in PSA compared to the control group (no significant differences occurred between 360°Audience and 360°Empty groups). Results were maintained at the 10-week follow-up.

Ayres and Schliesman (2002) examined whether paradoxical intention could reduce stress and the likelihood of unwanted behaviours occurring. According to Frankl (1969), suppressing an undesirable behaviour can increase stress and the probability of the unwanted behaviour occurring. Thus, when a person focuses on increasing an undesirable behaviour, this source of stress is theoretically eliminated. The intervention group were asked to identify the elements that bothered them regarding public speaking before exaggerating and focusing on them in a practice setting. The visualisation group were told to relax and listen to a script that helped them envision a positive speaking experience. Placebo group participants read material on great speeches while control group participants were left to their own devices for 20 minutes. Results after a post-test speech concluded that both paradoxical intention and visualisation groups reported significantly lower trait and state CA than the placebo and control groups.

Ayres, Hopf, and Will (2000) investigated whether systematic desensitisation would reduce CA in the context of a Solomon Four-Group Design (two control groups and two intervention groups). Systematic desensitisation is a behavioural technique in which individuals are gradually exposed to anxiety-provoking stimuli while simultaneously being engaged in a relaxation exercise. The intervention groups were exposed to a videotaped version of systematic desensitisation by Ayres et al. (1993). After a post-test speech, the results showed that systematic desensitisation produced a significant reduction in state and trait CA compared with the control groups.

The penultimate study in this section investigated the extent to which exposure therapy to an audience led to a decline in PSA (Finn et al., 2009). Exposure therapy (like systematic desensitisation) repeatedly exposes an individual to a feared stimulus in a safe environment. The intervention group participated in a multiple-exposure speaking

assignment, where each participant delivered the same presentation three times in a row to a different set of classmates. Between each presentation, participants had approximately five minutes to make any changes they deemed necessary to improve their performance. Control group participants completed alternative assignments requiring no public speaking. Results after a post-test speech indicated that the intervention group experienced a significant reduction in state anxiety compared to the control group.

The final exposure-based intervention examined the feasibility of arousal feedback-based exposure therapy in alleviating social anxiety symptoms in adults (Lin et al., 2019). The intervention group completed four weekly sessions and underwent three types of tasks per session: a psychoeducation component, eight brief arousal games, and six arousal feedback-based speech tasks. The psychoeducation component highlighted maladaptive thoughts and behaviours associated with high-arousal social situations. The brief arousal game-provided real-time feedback and allowed participants to gain an awareness of and manage their arousal levels. The arousal feedback-based speech task had participants deliver 6 x 2-minute speeches to a virtual audience. During the intervention period, stress manipulation also increased (i.e., larger audience size, negative facial expressions, attire, and difficulty of speech topic and type). Prior to delivery (except in the case of the impromptu speech), participants were given three minutes to prepare. Participants were given weekly tasks to complete (e.g., they were tested on key takeaways and were asked to identify their social anxiety concerns). Results indicated that arousal feedback-based exposure therapy was more successful in reducing anxiety related to public speaking when compared to the wait-list control group. Although results were maintained over a follow-up five-week period, no pre- and post-public speaking tests were used.

Cognitive Modification Strategies

The first study to utilise a cognitive modification strategy investigated whether communication-orientation motivation (COM) therapy could be used to reduce public

speaking apprehension (Ayres, Hopf, & Peterson, 2000). Participants were randomly assigned to COM therapy, systematic desensitisation, placebo, or control groups. Participants in the COM therapy condition were asked to read Motley's (1995) book *Overcoming your fear of public speaking: A proven method*. The book aims to help a person view public speaking from a communication orientation, as opposed to a performance orientation. Participants assigned to the systematic desensitisation condition worked through a videotaped version of systematic desensitisation therapy (see Ayres et al., 1993). The placebo group read a review of the *World's Great Speeches* (Peterson, 1965) which was of equal length. The control group did not receive any treatment. Results after a post-test speech revealed a significant reduction in CA and a significant increase in SPCC in the COM therapy and systematic desensitisation groups compared with the placebo and control groups. However, no difference between the intervention groups was reported, and no treatment condition improved willingness to communicate (WTC) scores.

Cunningham et al. (2006) examined the use of The Lefkoe Method (TLM) to eliminate the fear of public speaking. The TLM is based on the premise that anxiety is typically caused by specific beliefs through previous public speaking conditioning and experiences. First, participants identified an undesirable pattern of behaviour or feelings that was a reasonable interpretation of a similar previous situation. These undesirable patterns of behaviour or feelings can be reduced by helping participants realise that the current stimulus never produced the emotion (i.e., it is only a by-product of the meaning they gave to a previous similar situation). The wait-list control group received no treatment until after post-test. Results indicated that after a post-test speech, participants in the TLM group showed significant decreases in fear, anxiety, and subjective units of bothersome sensations scale scores. Significant increases were observed in satisfaction, confidence as a speaker, and relaxation scores when compared with the wait-list control group.

Another study investigated the effect of a single-session attention modification program on the response to a public-speaking challenge in socially anxious individuals (Amir et al., 2008). Both the intervention and control participants underwent 60 trials of a face dot-probe detection task. Each trial began with participants staring at a fixation cross in the centre of the screen for 500ms. Immediately afterwards, two faces of the same individual (one neutral, one disgust) appeared on the screen for 500ms. Subsequently, a probe (either the letter E or F) appeared in the location of one of the two faces, and participants had to determine which letter they saw as quickly and as accurately as possible. In the intervention group, the probe always replaced the neutral face, whereas in the control group, the probe replaced the neutral and disgusted faces at equal frequencies. After a public speaking component at post-test, results concluded that intervention participants showed significantly less attentional bias to threat along with lower levels of anxiety compared to control participants.

The next study examined the effectiveness of eye movement desensitisation and reprocessing (EMDR) therapy on PSA in university students (Aslani et al., 2014). EMDR therapy includes both systematic desensitisation and cognitive reprocessing. In each session, the intervention group imagined a stressful situation, such as trauma (e.g., a car accident), and followed the lateral movements of the therapist's finger. This process continued until either the patient expressed that the annoyance of the image had been reduced or approximately one minute had passed. During a state of deep relaxation, participants were asked to cognitively restructure the traumatic event and relieve their symptoms. Each participant then followed the movement of the therapist's fingers again while sharing all the negative thoughts in their mind. As they did so, participants were encouraged to think about positive thoughts such as "I can handle this issue." This would replace the original negative beliefs with positive ones. The results revealed that EMDR therapy led to a significant increase in perceived confidence

as a speaker and a reduction in physiological symptoms when compared to the control group; however, no public speaking component was used in this study.

Jackson et al. (2017) investigated the effectiveness of inoculation training where an individual could be inoculated from an impending psychological threat much in the same way that a person's immune system can be inoculated against a virus. Both intervention and control groups received a generic one-paragraph information sheet containing details about the activity, assessment, and implications of their performance. The intervention group also received forewarnings regarding the anxiety they may experience, counterarguments, and paired refutations targeting common preconceptions and anxiety-inducing concerns related specifically to public speaking. The results indicated that the intervention group, who received the inoculation message before their upcoming presentation, reported significantly lower pre-task anxiety, lower somatic anxiety, and viewed their nerves in a less debilitating light compared to those in the control group.

The final study to implement a cognitive modification strategy examined the efficacy of an ultra-brief cognitive defusion intervention for the reduction of PSA (Brandrick et al., 2020). Cognitive defusion is one of the six core processes in acceptance and commitment therapy (ACT; Hayes et al., 1999). Each participant was asked to write down a negative self-evaluative phrase regarding their personal perceptions about public speaking (e.g., "I'm going to make a mistake and look like a fool") before being assigned to either the defusion, positive self-affirmation, or control condition. Defusion participants reduced their self-evaluative negative phrase into a single (e.g., fool) before executing a word repetition task where they would repeat their chosen word aloud at their fastest speed for a period of 30 seconds (reducing its harmful impact as the meaning of the word becomes less salient). Participants in the positive self-affirmation group were taught to recognise their negative self-evaluative phrase as dysfunctional before cognitively reframing it to a positive rational thought (e.g., "I will probably do okay on this task"). Participants in the control condition

counted backwards from 100 as fast as possible. The results indicated that after completion of an impromptu speech task, participants in the defusion condition showed a significant reduction in PSA and subjective unit of distress scale scores compared to participants in the positive self-affirmation and control conditions.

Combined Strategies

Five studies implemented a combination of exposure and cognitive modification strategies to reduce PSA. The first study taught students to self-manage communication apprehension (CA) by self-selecting treatments (Dwyer, 2000). While all participants undertook a 15-week fundamentals of public speaking course, the intervention group was introduced to the multidimensional model (MM) for managing speech anxiety for the first three weeks, where the control group completed chapters in a traditional public speaking textbook. Participants were encouraged to focus on the treatment applicable to mastering their largest source of anxiety before working their way down a list of treatments for their anxieties. The results showed that although both groups reported significant reductions in CA levels, participants in the MM condition showed a significantly greater reduction in CA levels compared to the control group. However, no public speaking component was used in this study.

To treat the source of an individual's public speaking apprehension (e.g., affective, behavioural, or cognitive), Heuett et al. (2003) divided participants into single (visualisation, systematic desensitisation, or skills training) or multiple (combination of the three) treatment conditions. All groups watched tapes to guide them through their respective treatments (see Ayres et al., 1993). The placebo group viewed a videotape of great speeches of the past and the control group received no treatment. The results indicated that systematic desensitisation was most effective in reducing trait CA for affective sources of anxiety, whereas multiple treatments were most effective in reducing trait CA for cognitive and behavioural sources. Regarding willingness to communicate, visualisation was most effective for affective

sources, systematic desensitisation for behavioural sources, and skills training for cognitive sources.

The next study examined whether virtual reality cognitive behaviour therapy (VRCBT) could be used as an alternative to cognitive behaviour therapy (CBT) to reduce PSA (Wallach et al., 2009). The behavioural component of CBT provides the necessary exposure to feared stimuli (i.e., public speaking), whereas the cognitive component aims to challenge an individual's maladaptive thought patterns regarding the situation (e.g., this situation is not dangerous). Both VRCBT and CBT followed similar procedures, with the initial session introducing the therapy, determining participants' anxiety reactions, building an anxiety hierarchy, devising a treatment contract and rationale, and assigning homework. The wait-list control group completed only the pre-and post-test questionnaires. The results after a post-test speech concluded that both the VRCBT and CBT conditions were more effective in significantly reducing PSA compared to the wait-list control group. No significant differences were reported between the VRCBT and CBT conditions.

Tillfors et al. (2011) utilised a multi-session treatment to investigate the effectiveness of internet-based CBT in treating high school students with social anxiety disorder (SAD) and public speaking fears. As face-to-face therapy can sometimes be perceived as anxiety-provoking, Tillfors et al. decided to use internet-based CBT. Participants in the intervention group received a self-help manual containing nine modules, each consisting of information, exercises, and several essay questions. Participants had to complete weekly homework assignments before the next module could be accessed. The average number of modules finished was 2.9 out of a maximum of nine modules. Even though this number was low, the results illustrated that the intervention group participants reported significant reductions in social and general anxiety compared to the control group. These effects were maintained at the 1-year follow-up.

The final study to utilise a combination strategy investigated the efficacy of behaviour modification techniques for students to reduce public speaking (Jangir & Govinda, 2018). The authors used behaviourism as their theoretical framework, which posits that habits are learned through classical conditioning. Further, through behaviour modification (e.g., reinforcement, punishment, or extinction) habits can be learned or unlearned. Over six weeks, the intervention group received five interventions consisting of 'developing alternative emotional responses to threat', 'establishing dialogues with the audience in a graded manner (e.g., audiences that increased with size)', 'purposeful faltering while speaking', 'practising in front of a mirror', and 'reducing breathing rates.' When compared to the control group, results concluded that intervention group participants reported significantly reduced Personal Report of Public Speaking Anxiety (PRPSA) and Subjective Unit of Distress Scale (SUDS) scores, along with increased self-esteem. However, no public speaking component was used in this study.

Other Strategies

Several studies used alternative strategies to exposure and cognitive modification (or a combination of both) to reduce the effects of anxiety on public speaking performance. The first study explored the pharmacological and expectancy effects of alcohol on social anxiety in individuals with social phobia (Abrams et al., 2001). As alcohol can directly affect the central nervous system, a stress-response dampening effect can occur, leading to an individual experiencing relief from anxiety symptoms. Each participant consumed two drinks (either two alcoholic drinks, two placebo drinks, or two non-alcoholic drinks). Results after post-test speeches concluded that while individuals in the alcohol condition showed a significant reduction in performance anxiety (i.e., the anxiety experienced during the public speaking situation) compared to placebo and control groups, alcohol consumption had no significant effect on any measure of anticipatory anxiety (i.e., the anxiety experienced prior to the public speaking situation).

Pribyl et al. (2001) investigated the effectiveness of a skills-based program in reducing PSA. Participants in the intervention condition underwent skills training and were taught in both seminar and one-to-one formats how to prepare, practice, deliver, and reflect on a presentation. All presentations delivered during the course were videotaped to allow students to review their past performances. The control group completed only the pre-and post-test questionnaires. The results indicated that participants who received skills training reported significantly lower PSA scores in general, compared to the control group. However, no public speaking component was assessed pre- or post-intervention in either group.

Fitch et al. (2011) investigated the efficacy of primordial energy activation and transcendence (PEAT) in reducing CA related to public speaking. While this study utilised mixed methods, this review will focus on the quantitative results of the study. The intervention group was exposed to the basic PEAT protocol (see Slavinski, 2005), which consisted of several techniques, such as acupressure, visualisation, bilateral stimulation, and deep breathing. However, it is unclear whether all techniques were used on each participant. No details were provided describing what the control group did. After delivering their post-test speech, the results concluded that the intervention condition participants showed a significant reduction in CA compared to the control condition.

Buttelmann and Römpke (2014) investigated the anxiety-reducing effects of pre-speech distractors such as animals and plants. After a 5-minute speech preparation period, participants were instructed to engage with either a dog, a fish, or a plant (distraction tasks). Participants in the control condition were asked to wait for five minutes. The results concluded that while all intervention conditions showed a significant reduction in anxiety, only the dog intervention group had significantly lower levels of anxiety than the control group.

Another study examined the calming effect of a wearable doppel device during the anticipation of public speaking (Azevedo et al., 2017). Participants were assigned to either an

intervention group (doppel-active) or a control group (doppel-inactive), where the doppel delivered a discrete heartbeat-like vibration. The doppel was set to vibrate at a frequency 20% slower than the participant's heartbeat (as measured at rest). After pre-test measurements were taken, the doppel devices were all turned on (but switched off after 10 seconds in the control condition). At pre-test, both intervention and control groups displayed comparable levels of arousal (skin conductance) and state anxiety. At post-test (five minutes after the speech preparation task had been given), participants in the intervention group showed significantly reduced arousal and state anxiety compared to the control group.

The final study investigated the effects of breathing therapy and emotional freedom techniques (EFT) on PSA (Dİncer et al., 2022). Those assigned to the breathing therapy condition were guided through three stages: (1) muscular relaxation, (2) deep breathing, and (3) a visualisation exercise including positive affirmation. Throughout the breathing therapy stages, relaxing music with sounds of nature were used to maintain participant concentration and focus. Participants assigned to the EFT condition underwent an EFT tapping technique split into two stages. The first stage (preparation stage), determined the main problem causing anxiety, assessed the level of anxiety experienced, and participants repeated a positive affirmation (i.e., "I forgive myself; I accept myself; and I love myself despite my fear of. . .") three times. The second stage (tapping series) had participants tap eleven parts of their body using two fingers while repeating the affirmation statement seven times at each body part (Craig, 2008). The control group completed only the pre-and post-test measures. Post-test speaking anxiety scores for both the breathing therapy and EFT conditions were significantly lower than those of the control group. No differences in post-test scores were reported between the breathing therapy and EFT conditions.

Meta-Analysis

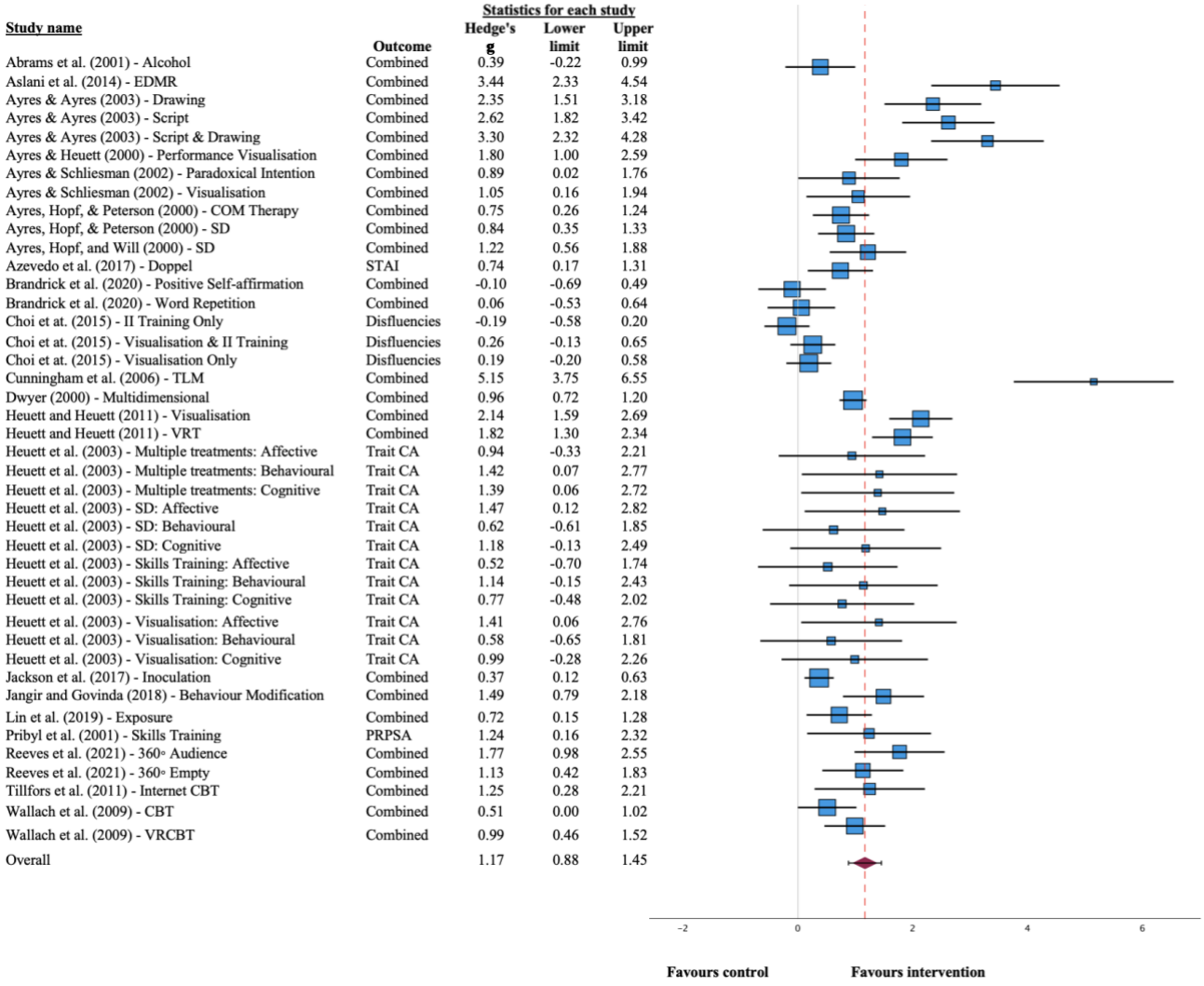
Statistical Analysis

To determine the effects of psychological interventions on PSA, effect sizes illustrating post-test differences between the intervention and control groups were calculated using Hedges' *g*. Following the recommendation of Hedges and Olkin (1985), Hedge's *g* was chosen over Cohen's *d* to account for small sample bias in population effect sizes. Cohen (1988) suggests that effect sizes can be interpreted as small (*g* = .2), medium (*g* = .5) and large (*g* = .8). If more than one outcome measure was used to assess intervention efficacy, relevant measures were pooled to provide a singular average effect size (Borenstein et al., 2009). Heterogeneity of effect sizes was assessed by calculating the *p*-value, I^2 statistic, and the prediction interval (PI). Borenstein et al. (2009) posit that the *p*-value determines if the effect size vary at all, the I^2 statistic illustrates what proportion of the variance in observed effects is real (i.e., not due to sampling error), and the prediction interval (PI) reveals how much the effect size varies. I^2 values of 25%, 50%, and 75% equate to low, moderate, and high variance respectively (Higgins et al., 2003). All analyses were conducted using SPSS (Version 29), and a random-effects meta-analysis model was utilised due to the variance in intervention type. Publication bias was assessed by visual inspection of funnel plots and Egger's intercept test (Egger et al., 1997).

Figure 2.1 provides a summary of the 21 studies included in the present meta-analysis, which included 42 interventions. Five studies (Amir et al., 2008; Buttelmann & Römpke, 2014; Dİncer et al., 2022; Finn et al., 2009; and Fitch et al., 2011) were excluded due to a lack of data available. The overall effect of psychological interventions for PSA was *g* = 1.17 (95% CI = .88 - 1.45), with high heterogeneity (I^2 = 88% PI = -.50 - 2.84) that was found to be significant ($p < .01$). Cunningham et al.'s (2006) TLM was the most effective study observed in this meta-analysis (*g* = 5.15, CI = 3.75 - 6.55, $p < .001$), while Choi et al.'s (2015) II training only was the least effective (*g* = -.19, CI = -.58 - .20, $p > .05$).

Figure 2.1

Forest Plot of Standardised Effect Sizes of Psychological Interventions Compared to Control Conditions.



Of the 22 interventions utilising exposure-based strategies, Ayres and Ayres (2003) script and drawing group was most effective (g = 3.30, CI = 2.32 - 4.28, $p < .001$) and Choi et al. (2015) II training only group was least effective (g = -.19, CI = -.58 - .20, $p > .05$). Among the six interventions that implemented cognitive-based strategies, Cunningham et al.'s (2006) TLM was the most effective (g = 5.15, CI = 3.75 - 6.55, $p < .001$). Of the eight interventions utilising combined strategies, Jangir and Govinda's (2018) behaviour modification was most effective (g = 1.49, CI = .79 - 2.18, $p < .001$) and Wallach et al. (2009) CBT was least effective (g = .51, CI = .00 - 1.02, $p \leq .05$). Finally, for the six studies implementing other

strategies, Pribyl et al. (2001) skills training was the most effective (g = 1.24, CI = .16 - 2.32, p < .05), while Abrams et al. (2001) Alcohol group was the least effective (g = .39, CI = -.22 - .99, p > .05).

To identify any potential outliers (i.e., extremely small or large effects), intervention confidence intervals were compared against the confidence interval of the pooled effect, along with a visual inspection of the funnel plot. This resulted in ten potential outliers that did not overlap with 95% of the pooled effect size. Five interventions from two studies had extremely small effects (Brandrick et al., 2020; Choi et al., 2015) and five interventions from three studies had extremely large effects (Aslani et al., 2014; Ayres & Ayres, 2003; Cunningham et al., 2006). Upon visual inspection of the histogram and boxplots, Cunningham et al. (2006) was identified as an extreme outlier. A subsequent sensitivity analysis was conducted to determine the influence of this study on biasing the pooled effect size. By omitting Cunningham et al. (2006), the overall effect of psychological interventions for PSA was g = 1.08 (95% CI = .83 - 1.34), with high heterogeneity (I^2 = 84% PI = -.33 - 2.49), which was found to be significant (p < .01). The influence of this extreme outlier on biasing the pooled effect size was minimal; therefore, the authors decided to continue using all the studies in this meta-analysis. Although visual inspection of the funnel plot indicated asymmetry (and potential publication bias), Egger's test resulted in a p-value of .39, indicating no publication bias.

Discussion

On average public speaking anxiety interventions reduced PSA by 1.17 standard deviations compared to control groups (CI = .88 - 1.45). The Z-value for testing the null hypothesis (g = 0.0) was 8.01 (p < .001), thus rejecting the null hypothesis. While this analysis reported an overall positive effect size, two interventions (Brandrick et al., 2020 – Positive Self-Affirmation; Choi et al., 2015 – II Training Only) recorded negative effect sizes (g = -.01; g = -.19). This finding contradicts the positive results reported in their papers.

Finally, this analysis provides additional evidence supporting the efficacy of PSA intervention, as observed in meta-analyses by Ebrahimi et al. (2019), Horigome et al. (2020), and Reeves et al. (2022).

General Discussion

The purpose of this study was to systematically review and meta-analyse all relevant psychological interventions over the past 23 years aimed at reducing PSA. A total of 26 studies met the inclusion criteria for this review. Treatments varied in type (e.g., cognitive modification, exposure therapy, combination, or other strategies), duration (e.g., single session to longer-term multi-session), and either focused on symptomatic treatment or aimed to target the source of a person's anxiety. Applied and theoretical applications are discussed along with limitations and future directions.

Single-Session Versus Multi-Session Interventions

When targeting anxiety-related symptoms, single-session treatments, such as the doppel device (Azevedo et al., 2017), EFT (Dİncer et al., 2022), alcohol (Abrams et al., 2001), or the use of dogs, fish, and plants (Buttelmann & Römpke, 2014) were most effective. In applied settings, if practitioners are seeking to implement short-term relief interventions, these 'one-shot' symptom-reducing interventions may be the most applicable. Although immediate relief is advantageous, the long-term effects remain unclear, as the root causes of the anxiety response remain unaddressed. In addition, some strategies may even cause long-term harm (e.g., the use of alcohol).

Conversely, when more time is available, multi-session interventions targeting the source of a person's anxiety may be the most appropriate. These interventions typically followed one theoretical viewpoint and adopted an appropriate intervention (e.g., cognitive modification for cognitive biases). However, in most cases, a one-size-fits-all approach was used (hence ignoring individual differences and needs). Although effective, multi-session

interventions require a longer commitment from participants and typically involve a trained specialist for administration.

Exposure to Feared Stimuli

In some studies, actual exposure to feared stimuli, such as public speaking, was a key part of treatment efficacy and effectiveness. Exposure to feared stimuli provided opportunities to test cognitive modifications in a practice setting, allowing extinction learning to occur (a gradual decrease in a person's fearful response). Exposure to feared stimuli (i.e., public speaking) occurred with the person either imagining the experience (e.g., Ayres & Ayres, 2003) or being directly exposed to it (e.g., Finn et al., 2009). While most articles in this review used traditional exposure to public speaking, some explored the use of virtual reality exposure therapy (VRET) as an alternative option (e.g., Reeves et al., 2021). VR can be as effective as traditional in vivo exposure by reducing the cognitive strain on a person to imagine the environment (benefitting those individuals who have difficulty creating images), allowing participants to experience hard-to-recreate situations (e.g., an audience of 1,000 people), taking individual differences into account (e.g., targeting specific public speaking fears), and be adjusted very quickly (see also Horigome et al., 2020; Reeves et al., 2022). However, the authors note that practitioners may find it difficult to acquire the equipment needed for VRET.

Cognitive Modification

Many interventions in this review utilised variations of cognitive therapies to allow participants to identify and replace maladaptive thought processes with more realistic, balanced alternatives. Interventions attempted to either alter the person's perceptions of the situation (e.g., COM therapy; Ayres, Hopf, & Peterson, 2000), determine and deal with the source of a person's anxiety (e.g., TLM; Cunningham et al., 2006), or reduce the saliency of threats (e.g., EMDR; Aslani et al., 2014). One proactive approach to anxiety treatment was to inoculate participants against the impending psychological threat of public speaking (Jackson

et al., 2017). Cognitive therapies are widely available, can be delivered in group or individual settings, administered by a trained specialist or through self-study, and can be used alongside behavioural therapy (e.g., CBT).

Limitations and Future Directions

Several limitations of current research are worth discussing. First, there was a lack of differentiation between the concepts of fear and anxiety, with no study highlighting their distinctions. Some studies aimed to reduce either a person's anxiety or fear related to public speaking, whereas others used the terms interchangeably (e.g., employed a questionnaire measuring anxiety to assess fear). Although a detailed discussion of the differences between the two is beyond the scope of this review, both concepts relate to threat avoidance. Gray and McNaughton's (2000) revised Reinforcement Sensitivity Theory (rRST) establishes a clear distinction between anxiety and fear. In short, threatening stimuli can be divided into those that require approach (eliciting anxiety) and those that can be avoided (eliciting fear). Future research should establish a clear distinction between the constructs of fear and anxiety and whether the intervention aims to reduce fear, anxiety, or both.

The public speaking component was another significant limitation observed across many studies included in this review. Only 42% of studies used a public speaking component pre- and post-intervention. Although some studies found that self-reported anxiety significantly decreased (illustrating intervention efficacy) without an assessment of speaking performance (pre- and post-test), it is difficult to determine real-world implications of the research. Future studies should incorporate a public speaking component pre- and post-intervention.

Another limitation concerns the use of the Personal Report of Communication Apprehension (PRCA; McCroskey, 1997) in determining treatment efficacy, as 38% of the studies used it either as a sole measure or in conjunction with others. The PRCA is a four-factor measure, with only one dimension (six items) assessing anxiety related to public

speaking. Studies included in this review either only used the public speaking dimension or used the PRCA in its entirety (see Table 2.2, Column 3). When used in its entirety, researchers may have reported intervention efficacy (as there was an overall improvement in PRCA scores). However, without a dimension breakdown, scores related to public speaking may not have improved at all. Future research should consider re-examining the construct validity of the PRCA to avoid such confounds.

McCroskey (2005) suggested using the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970) instead of the PRCA. As all 34 items on PRPSA focus directly on PSA, this psychological measure seems to be reliable in ascertaining the efficacy and effectiveness of a PSA intervention. Future research may even employ multiple psychological self-report measures of anxiety (e.g., one to determine levels of social anxiety and a second to determine levels of PSA) to make clearer distinctions between individuals who suffer from performance-only anxiety and those who suffer from generalised social anxiety disorder. This distinction would allow researchers to understand the effect of interventions on overall SAD as well as domain-specific PSA and to determine whether an individual or a group setting would be more beneficial for an individual's treatment. However, the sole use of using self-report anxiety assessments to assess intervention efficacy is a limitation. Future research should consider other assessment types (e.g., heart rate reactivity and observer ratings) to further assess intervention efficacy.

Another limitation observed was a failure to provide sufficient detail on the exposure elements of interventions. Without such details, the influence of confounding variables on treatment efficacy remains unknown. In addition, due to the lack of data, accurate study replication becomes more difficult. Future research should provide sufficient detail on exposure elements used and how they have tried to minimise the influence of anxiety-reducing behaviours (e.g., safety behaviours). Furthermore, for individuals with high PSA levels (and potentially low self-efficacy), in vivo exposure may be too overwhelming.

Therefore, individuals may benefit from a graded exposure, mastering in vitro exposure first, then proceeding to VRET (for a mild version of in vivo exposure), before advancing to traditional in vivo exposure (which can be graded as well). In addition, research implementing VRET should explore the use of Lin et al.'s (2019) arousal feedback-based system to increase exposure efficacy.

There was a general lack of long-term effectiveness assessed, with only three out of 26 studies conducting some form of follow-up (Lin et al., 2019; Reeves et al., 2021; Tillfors et al., 2011). Without examining the efficacy of interventions over time, it is difficult to determine whether participants continued with the gains they made or regressed to previous levels of anxiety. The use of follow-up measures (both self-reporting and public speaking events) taken at several time points (e.g., 1-month, 3-months, and 6-months post-test) would allow for the determination of the duration and durability of intervention effectiveness with potential 'top up' sessions to maintain effectiveness.

A "one-size-fits-all" approach was used in 92% of the studies, where all participants were given the same intervention. Owing to the complexity of PSA, such approaches may be counterproductive, as treatments lack effective targeting. Although two studies (Dwyer, 2000; Heuett et al., 2003) did consider the idiosyncratic nature of anxiety in intervention design, they are not without limitations. First, if an individual has limited introspection, self-selection for treatment may not be as effective as a trained specialist. Second, Heuett et al.'s (2003) study included only four participants per treatment condition which may be too small to adequately detect significant individual effects. Therefore, future research may explore the benefits of grouping individuals on the intensity and sources of PSA and then deliver appropriate interventions.

Future research may benefit from using a three-pronged intervention approach. Researchers could focus on increasing cognitive control (through cognitive therapies, e.g., Amir, 2008), reducing threat saliency (via exposure therapies, e.g., Ayres & Schliesman,

2002), and increasing self-efficacy (via repeated successful exposures to the specific stressors; Bandura, 1997). In addition, several of the cognitive therapies included in this review could easily be combined to provide a 'package' of treatments. This 'package' could target a wide array of cognitive biases to reduce selective attention to threat (Amir, 2008), increase psychological flexibility (Brandrick et al., 2020), increase the personal view of the speaker (Ayres & Ayres, 2003), and shift from a performance-oriented perspective of public speaking to a communication-oriented perspective (Ayres, Hopf, & Peterson, 2000).

Limitations of this Review

This review is not without its limitations. The authors were unable to access the APA PsychNet database or the following articles - Harris et al. (2002), Lister et al. (2010) and Lopez et al. (2014). Furthermore, five studies had to be omitted from the meta-analysis due to a lack of reported results. We attempted to contact the first authors of these studies; however, no responses were received.

Conclusion

To make the findings more generalisable to the public and practitioners, this review is the first of its kind to offer a detailed critical narrative synthesis of PSA interventions. Results from 26 articles showed that while intervention type varied greatly, interventions containing cognitive modification and exposure therapy were most common. Cognitive modification challenges maladaptive thoughts, whereas exposure therapies allow for incremental exposure to feared stimuli, which may acclimatise people to these environments. Interventions either focused on reducing the symptoms of anxiety or targeted the source of a person's anxiety. While some symptomatic treatments were highly effective in providing immediate short-term relief, the long-term implications remain unknown. Although individualised interventions may be time-consuming, they may be the most transformative at the same time.

While all studies illustrated efficacy, this review highlights limitations in the design and execution of interventions aimed at reducing PSA. Notably, there is a clear need to better

consider the approaches used to generate meaningful exposure to real-world public speaking situations. Going forward, the use of individualised treatment approaches, development of self-efficacy, and determination of long-term efficacy and effectiveness should also be explored. However, any intervention must allow the participant to practice the psychological skills they have learned in pressurised environments (for example, Bell et al., 2013).

Chapter 3: The Development and Validation of the Public Speaking Threats Questionnaire (PSTQ)

Abstract

Public speaking is a frequent recurrent task in both occupational and educational settings. However, it often elicits worries, concerns, anxieties, and in extreme cases, fear, panic, and avoidance. Although many questionnaires already exist in the public speaking anxiety literature, they fail to identify the specific threatening stimuli causing the anxiety response. This disregard for identifying sources of perceived threat risks intervention effectiveness. Therefore, the purpose of the present study was to develop and validate a self-report instrument that assesses sources of threat related to public speaking. Relevant literature and the author's applied work were used to generate items for the instrument. Three studies were carried out to assess the content and validity of the Public Speaking Threats Questionnaire (PSTQ), using three independent samples. Based on a sample of 248 adults (M_{age} = 33.54, *SD* = 7.89), Study 1 utilised a Bayesian structural equation modelling (BSEM) approach, revealing a three-factor model containing 26 items. The three-factor model consisted of physiological arousal, self-perceptions, and external judgements. Study 2 further validated a lightly revised model (27 items) using BSEM with a larger sample (n = 709; M_{age} = 38.97, *SD* = 12.33). Evidence of construct stability and criterion validity of the PSTQ is presented, with all subscale scores correlating significantly with existing assessments of anxiety. Study 3 assessed test-retest reliability and predictive validity using a sample from a UK university (n = 131; M_{age} = 20.16, *SD* = 2.56). Finally, this paper highlights the shortcomings of the current university experience in reducing PSA. The valid PSTQ is expected to significantly enhance and streamline current methodologies for the assessment and treatment anxiety related to public speaking.

Keywords: public speaking anxiety, fear of public speaking, bayesian

Introduction

An estimated 63% of the general population fear public speaking (Marinho et al., 2017) with 18% rating it more fearful than death (Dwyer & Davidson, 2012). In addition, approximately 97% of socially anxious individuals experience public speaking anxiety (PSA, Beidel & Turner, 2007). Research has shown that PSA can negatively affect the ability to critically think in group discussions, articulate speech, focus and think clearly, resulting in reduced performance (Blume et al., 2010; Hofmann et al., 1997; Voncken & Bögels, 2008). Further, research has shown that PSA can lead to other maladaptive behaviours (e.g., avoidance behaviours), resulting in negative occupational, educational, and social consequences (Aderka et al., 2012). In university settings, Russell and Topham (2012) found that 80% of students reported verbal presentations to be a source of social anxiety that negatively impacted learning and well-being. Further, Grieve et al. (2021) reported public speaking anxiety to have an overall negative effect upon students' university experience.

Anxiety and Performance

One theory that may explain why anxiety may have a detrimental effect on public speaking is Eysenck et al.'s (2007) attentional control theory (ACT). This theory posits that anxiety manifests in impaired attentional control. According to ACT, attention is regulated by a goal-directed attentional system (top-down processing) and a stimulus-driven attentional system (bottom-up saliency). Anxiety disrupts the balance between these two systems, diverting cognitive resources from task-relevant cues (e.g., recalling content, utilising vocal and physical skills) to task-irrelevant ones (e.g., worrying what the audience thinks of them). This reallocation of cognitive resources decreases performance in tasks involving the central executive system of working memory. This may lead to impairments of three major functions of the central executive termed inhibition e.g., ignoring task-irrelevant stimuli; shifting e.g., switching attention between the external audience and internal thoughts; and updating e.g., processing and updating new information (Miyake et al., 2000). Therefore, identifying and

subsequently reducing the impact of public speaking threats seems paramount for reducing anxiety and maintaining attentional control under pressure.

Self-report Questionnaires

To date, several self-report questionnaires have been available to assess a person's levels of anxiety and fear related to public speaking. These include variations of the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970); the Personal Report of Communication Apprehension (PRCA; McCroskey, 1982); the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970); the Public Speaking Anxiety Scale (PSAS; Bartholomay & Houlihan, 2016); the Brief Fear of Negative Evaluation (BFNE; Leary, 1983b); and the Personal Report of Confidence as a Speaker (PRCS; Paul 1966). The PRPSA is a 34-item, single-factor questionnaire measuring overall levels of PSA. The PRCA is a 24-item, four-factor model measuring communication apprehension in four domains (group, meeting, interpersonal, and public speaking). The STAI is a 40-item, two-factor measure that assesses levels of trait and state anxiety. The PSAS is a 17-item, two-factor questionnaire that determines overall PSA levels. Although Bartholomay et al. originally hypothesised a three-factor model for the PSAS (cognitive, behavioural, and physiological subscales), their confirmatory factor analysis revealed only two significant factors (positively and negatively worded items). The BFNE is a 12-item, single-factor questionnaire that assesses people's concerns about being negatively evaluated by others. Finally, the PRCS is a 30-item, single-factor model that measures PSA. Although determining the intensity of a person's anxiety is important, current questionnaires fail to identify the specific threatening stimuli that causes the anxiety response.

Antecedents of Stress

As high levels of anxiety in public speaking situations can have a sudden and dramatic impact on performance (e.g. Strahan & Conger, 1999), understanding their sources is paramount for intervention efficacy. The source of anxiety may also be multifaceted,

arising from multiple perceived consequences that may entail failing a job interview or an end-of-year academic viva voce. Consequences may include receiving poor grades in education or failing a sales pitch, leading to real or perceived social consequences such as remaining in poverty, group rejection, and/or humiliation, causing dejected-related emotions (Eisenberger & Lieberman, 2004; MacDonald & Leary, 2005).

Understanding, targeting, and intervening on the sources of PSA could go some way in reducing an anxiety response from manifesting in the first place. For example, LeFebvre et al. (2018) argue that in order to reduce PSA, we need to understand what fears people have regarding public speaking. In their qualitative study, they categorised public speaking fears into internal and external fears. Internal fears relate to negative thoughts and feelings concerning the self, whereas external fears focus primarily on audience responses and consequences of poor performance. Although their work offers valuable insight into the potential categorisation for the sources of PSA, their use of the term 'fear' as the source, and then fear and anxiety interchangeably causes conceptual ambiguity. To provide conceptual clarity, we draw on Gray and McNaughton's (2000) revised Reinforcement Sensitivity Theory (rRST). Gray and McNaughton (2000) argued that anxiety and fear are distinct entities. An individual can have either an anxious or fearful response to a threatening stimulus (real or perceived). An anxious response may involve carefully approaching the threat, whereas a fearful response may involve attempting to escape the situation entirely. We posit that the term fears used by LeFebvre et al. (2018) to denote sources of PSA should be substituted with 'threats,' as this is a more accurate representation of PSA sources.

While LeFebvre et al. (2018) offer valuable insight into the potential categorisation of the sources of PSA, the current study will expand on their work and focus on the categorisation of public speaking threats. For example, research points to a five-factor model comprising internal (physiological arousal and self-perceptions) and external (performance judgements, content judgements, and audience concerns) dimensions. Expanding on the work

of Rapee and Heimberg (1997), internal threats encapsulate the potential threats that arise from an attentional shift towards the cognitive and somatic stimuli concerning the self (inward focus), while external threats refer to threats that are concerned with stimuli outside of the self (outward focus). Physiological arousal refers to the voluntary and involuntary physiological manifestations of the individual (i.e., heart rate, body movements) which may be appraised as a threat (see Cheng et al., 2009). Self-perceptions relate to perceptions individuals have concerning themselves (e.g., their attributes, skill proficiencies) that are appraised as threats (Gibbons, 1990). It comprises of self-concept (the image a person has in their mind of who they are) and self-efficacy (a person's belief in their capacity to execute a verbal presentation). Performance judgements, content judgements, and audience concerns all relate to public self-focus which is "the general awareness of the self as social object that has an effect on others" (Fenigstein et al., 1975, p. 523). Performance judgements dimension relates to the threat of negative evaluation from the audience (e.g., audience seeing mistakes), whereas content judgements refer to threats concerning the content being delivered (e.g., boring content). Finally, audience concerns refer to a generalised perception of threats from the environment (e.g., everyone watching).

Terminology Issues

A further issue arising from the literature is the varying terms used synonymously to describe the elicitations related to public speaking. They include for example, public speaking anxiety (PSA; Bodie, 2010), fear of public speaking (FoPS; Blöte et al., 2009), communication apprehension (CA; McCroskey, 1977), public speaking apprehension (Ayres & Ayres, 2003), stage fright (Jangir & Govinda, 2018), speech fright (Dwyer, 1998), and performance anxiety (Bögels et al., 2010). Furthermore, while PSA and FoPS are the most frequently cited terminology, many studies use these terms interchangeably, often implementing anxiety measures to assess fear, and vice versa (e.g., Wallach et al., 2009). Although both anxiety and fear relate to the approach and avoidance of threats (Gray &

McNaughton, 2000), the purpose of the current set of studies was to understand what the sources of threat are that generate the anxiety response. Although assessing sources of threat that generate a fear response is an important line of research, we focused on anxiety due to its direct effect on cognitive performance and its relevance to the majority of the population. Understanding sources of threat may also increase intervention effectiveness (LeFebvre et al., 2018). For this article, we use a working definition of PSA as a "situation-specific form of social anxiety that arises from actual, anticipated, or imagined delivery of a speech in front of others."

Rationale

The identification of specific threats is essential in the therapeutic process of treating PSA. It compartmentalises the overwhelming generality of the threat (e.g., public speaking situations) into manageable, specific parts that can be targeted and overcome (e.g., forgetting my words). Although qualitative approaches have evidenced public speaking threats, these methodologies, while effective at identifying such threats, are often time-consuming. Additionally, across the PSA literature, most studies failed to explore specific threats related to public speaking and instead tend to focus on the overall anxiety response and treatment (e.g., Ayres & Ayres, 2003; Jackson et al., 2017; Pribyl et al., 2001).

In the modern world, expediency is key, especially in larger organisations, such as businesses and universities. Therefore, the expediency of public speaking threat identification allows for greater time to be spent on treatments to overcome them. This expediency will help to reduce the negative impact on the individual and the organisation. Therefore, considering the above-mentioned limitations, we argue that the creation of a new measure designed to identify specific public speaking threats is not only valuable but also necessary. The development and validation of the Public Speaking Threats Questionnaire (PSTQ) will be the first of its kind and will allow both individuals as well as applied practitioners to quickly identify specific threats that impede communication.

Research Aims

The main objective of the current study was to develop and validate a new questionnaire that captures the essential antecedence of public speaking threats. This new measure will allow both individuals and applied practitioners the ability to identify what specific threats may be causing a public speaking anxiety response. Therefore, we set out to examine; (1) what are the main sources of public speaking threats? (2) are sources of public speaking threats better explained by a unidimensional or a multi-dimensional construct? (3) do perceptions of public speaking threats predict academic performance at university? (4) do public speaking threats reduce across the duration of a three-year academic degree? (5) are there gender differences in public speaking threats perceptions?

Study 1

Method

Participants

A sample of 248 participants (121 men, 126 women and one non-binary, M_{age} = 33.54 years, *SD* = 7.89 years) volunteered to take part in this study. Most participants were white (*n* = 215, 86.7%), with the remaining identifying as Asian (*n* = 17, 6.9%), black (*n* = 9, 3.6%), or mixed (*n* = 7, 2.8%). Participants were predominantly employed or self-employed (*n* = 193, 77.9%), with the remaining unemployed (*n* = 24, 9.7%), full-time students (*n* = 22, 8.9%), or preferred not to say (*n* = 9, 3.6%). Participants had to be 18 years of age or older, English had to be their first language, and they had to find public speaking as anxiety and/or fear-provoking**.**

Item Development

The development of the Public Speaking Threats Questionnaire (PSTQ) was split into two phases. Phase 1 focused on the development of items that were relevant to persons engaging in a public speaking situation, while Phase 2 utilised Bayesian structural equation modelling (BSEM) to validate the questionnaire and refine the scale.

Phase 1

Phase 1 developed an initial pool of items that was comprehensive and applicable to many public speaking situations. Items were sourced from relevant literature and the first author's applied work in coaching. An initial pool of items was created to reflect key threats related to public speaking. For this article, the authors define public speaking threats as 'any stimuli encountered in a public speaking situation that a person appraises to cause them potential social harm.' This definition separates threats encountered in other situations that may lead to generalised anxiety disorder (GAD) or social anxiety disorder (SAD). Clarification is important, as the treatment and management of GAD and SAD will be different from a performance-only situation (Aune et al., 2023).

The authors followed the widely accepted principles of good practice of questionnaire design, whereby we sought to create clearly worded items that asked singular questions, avoiding double negatives (MacKenzie et al., 2011; Schwarz, 2007). For simplicity, variations of the term 'worry' were used to describe each public speaking threat. Furthermore, both inductive and deductive methodologies were used for item generation (see Boateng et al., 2018), examining existing public speaking scales, literature review, and the first author's own applied work. Following the recommendation of Clark and Watson (1995), items were amalgamated, modified, and deleted where necessary. The authors examined each item and discussed its relevance for inclusion in the measure. This process resulted in a preliminary 62-item measure that we titled the Public Speaking Threats Questionnaire (PSTQ). As accessing a large number of participants immediately before a public speaking event occurred was not possible, we opted to assess general beliefs towards public speaking threats. After considering a variety of response scales, the authors selected a five-point Likert-type response scale (1 = never, 2 = rarely, 3 = sometimes, 4 = very often, 5 = always) as the most appropriate scale for assessing the initial set of items. Participants were asked to read each statement and indicate the degree to which each one applied to how they

"generally" felt about public speaking. Expanding on Lefebvre et al. (2018) work, the 62-item PSTQ was based on five dimensions of public speaking threats: physiological arousal (e.g., "I worry about having butterflies in my stomach"), self-perceptions (e.g., "I worry that I will speak too fast"), performance judgements (e.g., "I worry that people will think I'm boring"), content judgments (e.g., "I worry that what I say won't make sense to the audience"), and audience concerns (e.g., "Everyone watching me speak worries me"). See Appendix A for the complete 62-item PSTQ.

After obtaining university ethical approval, participants were recruited via Prolific (an online research platform) to take part in this study. Participants were informed that participation was voluntary and that they could withdraw from the study at any time. Informed consent was obtained from participants before the start of the study. Participants completed the 62-item PSTQ items via a link to Qualtrics online survey software. The 62 items were displayed in a random order for each participant, with the addition of two filler questions to assess attention. These filler questions were designed to appear in the same style as the other items. Three participants were excluded from further analysis because they failed to answer the attention-based questions correctly.

Data Analysis

The factor structure of the initial PSTQ-62 was tested using Bayesian structural equation modelling (BSEM; Muthén & Asparouhov, 2012). BSEM is confirmatory, less restrictive than traditional methodologies, and views parameters as variables with a mean and distribution rather than as constants (as seen in Maximum Likelihood analysis; Niven & Markland, 2016). This distinction allows for the specification of informative priors on cross-loadings and residual correlations with approximate zero means and small variances. These variances are specified a priori, setting limits on the deviation from zero that will be within tolerable limits (i.e., small variances imply estimates are close to zero, but not exactly zero).

Data was standardised before estimating a series of three BSEM models (see Niven & Markland, 2016). The initial model incorporated non-informative priors for major loadings, exact zero cross-loadings, and zero residual correlations. The second model included the addition of informative approximate zero cross-loadings, whereas the final model incorporated residual correlations into the model. The authors specified prior variances at ± .1, leading to factor loadings and residuals with a 95% limit of ± .2. This represents small cross-loadings and correlated residuals in line with previous studies (see Muthén & Asparouhov, 2012).

All BSEM models were estimated using the Markov Chain Monte Carlo (MCMC) algorithm procedure with the Gibbs sampler, two chains, and a fixed number of 100,000 iterations. Model convergence was evaluated using the potential scale reduction factor (PSR). Gelman et al. (2013) postulate that model convergence is successful when the PSR value lies between 1.0 and 1.1 for all parameters. A visual inspection of the trace plots was also performed. Model fit was assessed using the posterior predictive *p-value* (PP*p*) and the likelihood ratio $\chi 2$ test. Muthén and Asparouhov (2012) state that a PP*p* approaching .50 with a symmetric 95% credibility interval centred around zero indicates a good model fit. Furthermore, RMSEA values < .06, TLI > .95, and CFI > .95 indicate a good model fit (see Hu & Bentler, 1999). To determine whether alternative prior variances would influence outcome measures, a sensitivity analysis was conducted on the final model (Muthén & Asparouhov, 2012). Final models were rerun with prior variances specified at .05 and .15 for the cross-loadings and checked for discrepancies in parameter estimates.

Results

Although the initial 62-item model achieved convergence, and all factor loadings were significant, the PP*p* and χ^2 values indicated a poor fit to the data (see Table 3.1). To improve the model fit, 36 items were removed based on low factor loadings and theoretical relevance (Biddle et al., 2001). Items that were removed were either ambiguous, irrelevant, or

overly similar to other items. Although a five-factor model was initially hypothesised for the PSTQ, after exploratory structural equation modelling (ESEM) a three-factor model was deemed the best fit. The new three-factor model comprised of items referring to physiological arousal, self-perceptions, and external judgements dimensions. Following item removal, the 26-item model was tested with and without small variance priors on the cross-loadings. Although all 26-item BSEM models achieved good convergence, the PP*p* indicated a poor fit for both non-informative priors and informative small variance priors on cross-loadings with zero residual correlations (PP*p* = 0.000). The final model achieved a PP*p* of .59 with informative small variance priors on cross-loadings and residual correlations, indicating a good fit (see Muthén & Asparouhov 2012). Furthermore, the 95% credibility intervals centred around zero, the Root Mean Square Error of Approximation (RMSEA) was .05, TLI > .90, and CFI > .90, indicating a good fit (see Fabrigar et al., 1999; Hu & Bentler, 1999). See Table 3.1 for a full breakdown of BSEM statistics and convergence scores.

Table 3.1

BSEM Fit Statistics and Convergence, Including PPp and 95% Credibility Intervals

	PP*p*	RSMEA	CFI	TLI	Difference between observed and replicated $\chi 2$ 95% CI	
BSEM Fit Statistics					Lower 2.5%	Upper 2.5%
62-item noninformative	0	.07	.79	.79	1746.47	2033.80
62-item informative priors (cross-loading)	0	.06	.82	.81	1451.57	1766.69
62-item informative priors (cross-loading + residual correlations)	.84	.64	.99	0	-285.97	90.70
26-item noninformative	0	.07	.88	.87	306.63	431.39
26-item informative priors (cross-loading)	0	.06	.92	.91	173.55	311.33
26-item informative priors (cross-loading + residual correlations)	.59	.05	1	.93	-88.21	70.76

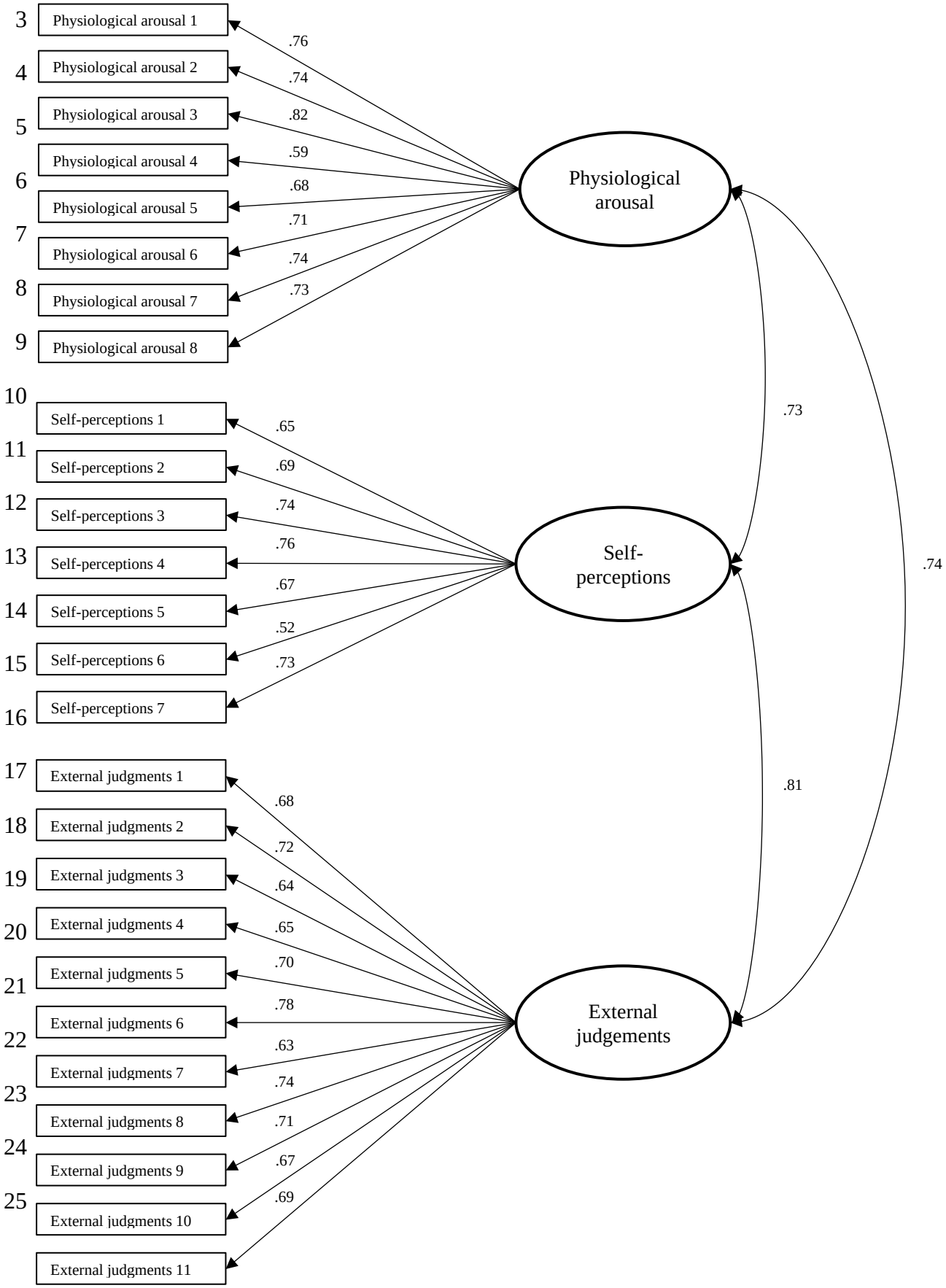
Note. BSEM = Bayesian structural equation modelling; PP*p* = posterior predictive *p-value*; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index

All major loadings on the 26-item measure were significant (see Table 3.2 for standardised factor loadings and 95% credibility intervals and Figure 3.1 for path diagram of BSEM CFA). PSR values for the final model reached a convergence of between 1.0 and 1.1 at 19,800 iterations. Additionally, visual inspection of the trace plots supported model

convergence, with no upward or downward trends in the means and the two chains overlapping in their variability.

Figure 3.1

Path Diagram of BSEM Confirmatory Factor Analysis – Three-Factor Model



All estimated correlations for all factors were significant. For the physiological arousal factor, the estimated correlations between the eight items ranged between .59 and .81, with all being significant. For the self-perceptions factor, correlations ranged between .52 and .76 for the seven items, all of which were significant. All 11 items for the external judgements factor were significant, and correlations ranged between .63 and .78.

Table 3.2

Means, Standard Deviations, and BSEM Standardised Factor Loadings for Each Item, Including 95% Credibility Intervals

Standardised factor loadings for final items	*M*	*SD*	Physiological arousal	Self-perceptions	External judgements
PA1. I worry about having butterflies in my stomach.	3.52	1.17	**.76 [.52, .99]**	.01 [-.17, .18]	-.01 [-.18, .16]
PA2. My mouth or throat going dry worries me.	3.39	1.26	**.74 [.51, .97]**	.03 [-.15, .20]	.05 [-.13, .22]
PA3. I worry that my voice will tremble when I speak.	3.80	1.13	**.82 [.58, 1.03]**	.01 [-.16, .18]	-.05 [-.23, .12]
PA4. I am worried that I might sweat a lot (i.e., forehead or armpits).	3.38	1.25	**.59 [.32, .86]**	.03 [-.16, .21]	.03 [-.15, .21]
PA5. I worry that my face may go red.	3.51	1.37	**.68 [.41, .92]**	-.03 [-.20, .15]	-.02 [-.20, .16]
PA6. I'm worried that I will be sick.	2.19	1.12	**.71 [.45, .96]**	-.04 [-.22, .13]	-.03 [-.20, .15]
PA7. I'm worried that I won't be able to breathe properly.	2.92	1.26	**.74 [.50, .98]**	.03 [-.16, .20]	.00 [-.17, .18]
PA8. I worry that I will fidget too much.	3.18	1.19	**.73 [.51, .95]**	.01 [-.16, .18]	.07 [-.11, .24]
SP1. I'm worried that I won't be able to control my anxiety symptoms.	3.87	1.13	-.02 [-.20, .15]	**.65 [.37, .94]**	.08 [-.13, .27]
SP2. I worry that I won't be able to get everything across in the given time.	3.35	1.05	.01 [-.16, .18]	**.69 [.43, .95]**	.01 [-.18, .19]
SP3. I'm worried about being worried (being in my own head).	3.95	1.05	.08 [-.09, .24]	**.74 [.49, .99]**	-.00 [-.19, .18]
SP4. I worry that I will speak too fast.	3.51	1.21	.01 [-.17, .18]	**.76 [.48, 1.04]**	-.11 [-.29, .09]
SP5. My voice being too monotonous (one level) worries me.	3.04	1.25	-.04 [-.22, .14]	**.67 [.38, .95]**	.01 [-.18, .20]
SP6. Not knowing what to do with my hands and arms worries me.	3.23	1.17	.04 [-16, .22]	**.52 [.21, .82]**	.03 [-.18, .23]
SP7. I'm worried that I will forget my words (brain freeze).	4.12	0.96	-.00 [-.17, .16]	**.73 [.49, .98]**	.08 [-.11, .27]
EJ1. I worry that people will think I'm boring.	3.51	1.08	-.01 [-.18, .15]	.06 [-.13, .25]	**.68 [.43, .93]**
EJ2. I worry about being judged in a negative fashion (e.g., inadequate, inferior, incompetent).	3.99	1.02	.02 [-.13, .17]	.06 [-.12, .23]	**.72 [.50, .95]**
EJ3. I worry that I will embarrass myself in front of the audience.	4.23	0.94	.01 [-.17, .19]	-.01 [-.20, .18]	**.64 [.37, .91]**
EJ4. I'm worried that the audience will see that I'm nervous.	4.12	0.96	.03 [-.15, .20]	.07 [-.12, .26]	**.65 [.39, .91]**
EJ5. I'm worried that the audience will see me not speaking fluently (e.g.., using filler words, ums, errs, etc.).	4.07	0.95	.02 [-.15, .19]	.00 [-.18, .19]	**.70 [.44, .95]**
EJ6. I am worried about the audience seeing me making a mistake.	4.00	0.91	-.03 [-.19, .13]	-.00 [-.19, .17]	**.78 [.54, 1.02]**
EJ7. Everyone watching me speak worries me.	3.63	1.11	.03 [-.15, .21]	-.01 [-.20, .19]	**.63 [.35, .90]**
EJ8. I worry about getting unexpected responses from the audience (e.g., interruptions).	3.43	1.08	-.07 [-.24, .11]	.02 [-.21, .17]	**.74 [.46, 1.00]**
EJ9. I worry that someone will ask me a question that I don't know the answer to.	3.91	1.07	.01 [-.16, .18]	-.04 [-.22, .15]	**.71 [.44, .95]**
EJ10. Speaking in front of my superiors (e.g., boss, teacher) worries me.	3.89	1.03	.01 [-.18, .17]	-.01 [-.19, .18]	**.67 [.40, .94]**
EJ11. I'm worried about speaking in front of my peers (e.g., colleagues, friends).	3.68	1.07	.08 [-.10, .25]	-.01 [-.19, .18]	**.69 [.43, .95]**

Note. Factor loadings and 95% credibility intervals in bold correspond to the items in each row.

To assess the internal consistency of factor items, Cronbach's Alpha coefficients were calculated (Cronbach, 1951). Table 3.3 shows factor subscale means, standard deviations, and Cronbach's Alpha coefficients. Scores were between .8 and .9 for all factors, indicating good to excellent internal consistency.

Table 3.3

Cronbach's Alpha, Means, Standard Deviations, and BSEM Inter-Factor Correlations for the PSTQ

	No. items	Cronbach's Alpha	*M*	*SD*	Physiological arousal	Self-perceptions	External judgements
Physiological arousal	8	.86	3.23	.49			
Self-perceptions	7	.82	3.58	.41	.73*		
External judgements	11	.90	3.90	.26	.74*	.81*	

Note. $p < .001$*

Owing to the high inter-factor correlations (see Table 3.3) of the three-factor PSTQ, the authors analysed the data as both a single-factor and a two-factor model. For the single-factor model, all items were loaded onto one factor to determine whether the three-factor model should be replaced with a single public speaking threats factor. The analysis initially revealed a good model fit for the data PP*p* = .57, 95% CI [-86.47, 72.17]. However, upon closer inspection, the RMSEA value was .16, indicating a poor fit (see Fabrigar et al., 1999). In two-factor modelling, three combinations were tested. The first two-factor model combined the physiological arousal and self-perceptions factors to create 'internal threats' and external judgements remained unchanged. The second two-factor model combined self-perceptions and external threats to create 'cognitive threats' while physiological arousal remained the same. Finally, physiological arousal and external threats were combined into one factor, with self-perceptions remaining unchanged. While all two-factor models revealed good PP*p* and 95% CIs, RMSEA values indicated poor fits (.17, .16, & .17 respectively). This analysis indicated that the three-factor model for the PSTQ was the most appropriate PP*p* = .59; 95% CI [-88.21, 70.76]; RMSEA = .05.

Sensitivity analyses were performed on the final 26-item model to determine whether changes in prior variances influenced factor loadings and cross-loadings. The final model was rerun, specifying prior variances at .005, .01, and .015 for cross-loadings. Results indicated stable factor loadings and cross-loadings for both smaller (.005) and larger (.015) prior variances, with all discrepancies within ± .05. Therefore, we conclude that the model is reliable and robust to default prior specification.

Gender Differences

To test for gender differences in physiological arousal, self-perceptions, and external judgements threats, an independent t-test was conducted. Significant differences were observed in all dimensions. For the physiological arousal dimension, women (M = 3.50; SD = .82) scored significantly higher than men (M = 2.96; SD = .84), $t(245) = -5.12$, $p < .001$. For the self-perceptions arousal dimension, women (M = 3.84; SD = .70) scored significantly higher than men (M = 3.31; SD = .75), $t(245) = -5.79$, $p < .001$. For the external judgements dimension, women (M = 4.19; SD = .60) scored significantly higher than men (M = 3.61; SD = .71), $t(245) = -6.99$, $p < .001$.

Age Correlations

Pearson correlation coefficients were calculated to determine the relationship between age and PSTQ dimension scores. There was a low negative correlation between age and external judgement scores ($r = -.18$; $p < .01$). These results suggest that, as age increased, perceptions of general external judgements as a source of anxiety decreased. No other significant correlations were found.

Discussion

The results of BSEM analyses of Study 1 failed to find evidence to support the hypothesised five-factor model of the Public Speaking Threats Questionnaire (PSTQ). Instead, preliminary support for a 26-item, three-factor model comprising physiological arousal, self-perceptions, and external judgements dimensions was found. These dimensions

share similar qualities to Cheng et al.'s (2009) three-dimensional conceptualisation of performance anxiety and Jones et al.'s (2019) three-factor model of competitive anxiety. That is, the physiological arousal dimension of the PSTQ parallels the autonomic hyperactivity lower-order subcomponent of the physiological dimension in Cheng et al.'s and Jones et al.'s models. Second, the self-perceptions dimension of the PSTQ provides evidence for the combination of the worry and private self-focus lower-order subcomponents of the cognitive dimension seen in Jones et al.'s model. Finally, the external judgements dimension of the PSTQ parallel's the public self-focus dimension lower-order sub-component and supports Jones et al.'s rationale for the compartmentalisation of 'self-focused attention' into 'public self-focus' and 'private self-focus.'

The final model with informative small variance priors on cross-loadings and residual correlations achieved a good fit, with loadings of individual items being high (.52 – .82) and construct validity demonstrated through high inter-factor correlations (.73 – .81). Items "I am worried that I might sweat a lot" and "not knowing what to do with my hands worries me" were the lowest scoring items (.59 and .52 respectively). However, as these items were of theoretical relevance and above the acceptable cut-off of .40 (see Stevens, 1992), we decided to retain them in the model for subsequent analysis.

To assess the internal consistency, Cronbach's alpha coefficients were calculated (Cronbach, 1951). An alpha coefficient > .9 indicates excellent internal consistency, > .8 good, > .7 acceptable, > .6 questionable, > .5 poor, and < .5 unacceptable (see George & Mallery, 2003). Internal consistency of factor subscales was high (physiological arousal, α = .82; self-perceptions, α = .82; external judgements, α = .90), indicating a good fit for physiological arousal and self-perceptions factors, and an excellent fit for external judgments**.**

Although Study 1 provided initial evidence to support the PSTQ as a psychometrically validated measure of public speaking threats, further investigation is required. To address the concurrent validity of the PSTQ, BSEM analyses and correlations

with well-established measures of anxiety and personality using a second, larger, more heterogeneous sample is explored.

Chapter 2 reported variations of the Personal Report of Communication Apprehension (PRCA; McCroskey, 1985) and the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970) as the most frequently used measures to assess public speaking anxiety (PSA). Owing to the limitations of the PRCA (see Chapter 2), we chose to follow McCroskey's (2005) suggestion of utilising the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970) to measure PSA. As the PSTQ measures trait public speaking threats, correlations with well-established measures of trait anxiety are warranted. Due to concerns over respondent fatigue, we opted to use the State-Trait Anxiety Inventory Short Version (STAIT-5; Zsido et al., 2020) over the original 20-item STAI-Y (Spielberger et al., 1970) due to its brevity and excellent reliability. The STAIT-5 measures trait anxiety and has been used in academic, performance, and healthcare settings (Alesi et al., 2023; Liu & Tang, 2023; Silang et al., 2023). As the PSTQ factors contain assessments of physiological arousal, self-perceptions, and external judgements, we also examined the revised Worry-Emotionality Scale (WES; Morris et al., 1981). The WES assesses levels of worry (cognitive anxiety) and emotionality (physiological responses) in test contexts. The worry subscale parallels the self-perceptions and external judgements dimensions of the PSTQ, while the emotionality subscale parallels the physiological arousal dimension. The WES has been used in academic and military settings (see Ganley & Vasilyeva, 2024; Glass et al., 1995).

A final questionnaire worth including in the analyses is the Reinforcement Sensitivity Theory of Personality Questionnaire (RST-PQ; Corr & Cooper, 2016). According to Gray and McNaughton's (2000) revised Reinforcement Sensitivity Theory (rRST), anxiety and fear relate to the avoidance of threats. rRST posits three systems which control approach and avoidance behaviours: the fight-flight-freeze system (FFFS); the behavioural approach system (BAS); and the behavioural inhibition system (BIS). The FFFS mediates fear and is

activated by threatening stimuli that can be avoided (active avoidance). When defensive distance is very short (perceived or actual) and avoidance is not possible, freezing and panic occur (Vecchione & Corr, 2020). The BIS mediates anxiety and is activated by goal conflicts (e.g., a threatening stimulus that must be faced – approach/avoidance conflict [Perkins et al., 2007]). BIS activation results in motor interruption, risk assessment, rumination, obsessive thoughts, and disengagement behaviours (Corr, 2008). Finally, the BAS is activated by rewarding stimuli (conditioned and unconditioned), mediates anticipatory pleasure, and elicits approach behaviour. Alongside rewarding stimuli, non-punishment and escape from punishment will activate the BAS (Corr & McNaughton, 2012). Although a relatively new measure, the RST-PQ has been used in multiple studies (e.g., Bacon et al., 2018; Beaton et al., 2017; De Pascalis & Scacchia, 2019) and translated into several languages (see Contreras et al., 2022; Eriksson et al., 2019; Pugnaghi et al., 2018; Wytykowska et al., 2017). Therefore, as a person's perceived levels of public speaking threat activate either an anxiety (BIS) or fear (FFFS) response, Corr and Cooper's (2016) RST-PQ is a suitable measure for inclusion in the analyses.

In summary, a second, larger sample is used to reconfirm factor validity and the PRPSA (McCroskey, 1970), STAIT-5 (Zsido et al., 2020), WES (Morris et al., 1981), and RST-PQ (Corr & Cooper, 2016) are used to determine the concurrent and convergent validity. We hypothesise that all PSTQ dimensions will have strong positive correlations with the PRPSA, STAIT-5, and RST-PQ. Furthermore, we hypothesise the physiological arousal dimension of the PSTQ to correlate strongest with the emotionality subscale of the WES and the self-perceptions and external judgements dimensions to correlate strongest with the worry subscale of the WES.

Study 2

Method

Participants and Procedure

Applying the same inclusion criteria as Study 1, a final sample of 709 participants were recruited via Prolific (356 men, 349 women, one non-binary, one genderqueer and two non-responders, M_{age} = 38.97 years, *SD* = 12.33 years). As in Study 1, most of the participants were white (*n* = 624, 88%), while the remaining participants were Asian (*n* = 32, 4.5%), mixed (*n* = 29, 4.1%), black (*n* = 23, 3.2%), or preferred not to say (*n* = 1, .1%). Participants were predominantly employed or self-employed (*n* = 516, 72.8%), with the remaining unemployed (*n* = 114, 16.1%), full-time students (*n* = 56, 7.9%), or preferred not to say (*n* = 23, 3.2%).

Participants completed several measures to assess the reliability and validity of the PSTQ using Qualtrics online survey software. To reduce potential ordering effect, measures and items were randomised. Due to the increased duration which participants would be required to focus on, four filler questions were used to assess attention (instead of only two, as seen in Study 1). As per Study 1, these filler questions were designed to appear in the same style as the other items. Due to failure to answer these attention-based questions correctly, 10 participants were excluded from further analysis.

Measures

The Public Speaking Threats Questionnaire (PSTQ)

The 26-item version of the PSTQ described in Study 1 was used in this study, with the inclusion of one additional item *(performing poorly worries me)* added to the self-perceptions dimension (see Appendix B). As speakers are often concerned with the evaluative aspects of performance (LeFebvre et al., 2018), we believed it was an item of value and worth testing on a new sample. This resulted in a 27-item version of the PSTQ. Internal consistency

(Cronbach's α) of the physiological arousal, self-perceptions, and external judgements subscales for Study 2 were .84, .83, and .92 respectively.

The Personal Report of Public Speaking Anxiety (PRPSA)

The PRPSA (McCroskey, 1970) is a self-report measure of public speaking anxiety. The single-factor measure comprises of 34 items rated on a 5-point Likert scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. Statements included: "*While preparing for giving a speech, I feel tense and nervous*." Higher scores are indicative of higher levels of public speaking anxiety. Internal consistency (Cronbach's α) of this measure in the current sample was .96.

State-Trait Anxiety Inventory Short Version (STAIT-5)

The STAIT-5 (Zsido et al., 2020) is a single-factor, five-item measure of trait anxiety. All items are rated on a 4-point Likert-type response scale ranging from 1 *(not at all)* to 4 *(very much so)*. Statements included: "*I worry too much over something that really doesn't matter*." Internal consistency (Cronbach's α) of this measure in the current sample was .89.

Revised Worry-Emotionality Scale (WES)

The WES (Morris et al., 1981) is a two-factor, 10-item measure that assesses worry and emotionality (five items per subscale). Items are rated on a 5-point scale ranging from 1 *(the statement does not describe my present condition)* to 5 *(the condition is very strong; the statement describes my present condition very well)*. Items included *"I feel my heart beating fast"* for the emotionality subscale and *"I feel that others will be disappointed in me"* for the worry subscale. As the WES was originally developed to assess worry and emotionality concerning test contexts, three items were modified for public speaking situations (the word test was substituted with presentation). Internal consistency (Cronbach's α) of the worry and emotionality subscales in the current sample were .86 and .90 respectively.

The Reinforcement Sensitivity Theory of Personality Questionnaire (RST-PQ)

The RST-PQ (Corr & Cooper, 2016) is a 65-item measure for assessing differences in sensitivity to the Fight-Flight-Freeze-System (FFFS; related to fear), Behavioural Inhibition System (BIS; related to anxiety), and Behavioural Activation System (BAS; related to approach behaviours). As the PSTQ assesses perceived levels of threat, the authors decided to use the FFFS (10 items) and BIS (23 items) subscales in this study. We chose not to use the BAS subscale for this study due to its length (32 items) and focus on approach behaviours (e.g., reward interest, goal-drive persistence, reward reactivity, impulsivity).

The FFFS subscale comprises the flight, active avoidance, and freeze domains, while the BIS subscale comprises the motor planning interruptions, cautious risk assessment, obsessive thoughts, and behavioural disengagement domains. A 4-point Likert scale is used, ranging from 1 *(not at all)* to 4 *(highly)*. FFFS subscale statements included: *"When nervous, I sometimes find my thoughts are interrupted"* and BIS subscale statements included: *"I often worry about letting down other people."* Internal consistency (Cronbach's α) of the FFFS and BIS subscales in the current sample were .82 and .96 respectively.

Data Analysis

Confirmatory validation of the PSTQ used the same BSEM approach as Study 1, starting with zero cross-loadings and residual correlations, before small variance priors and cross-loadings then finally, small variance priors for cross-loadings and residual correlations. Criterion validity analyses were performed using SPSS version 29.

Results

Confirmatory Validity PSTQ

Following the same process and cut-off thresholds as in Study 1 (PP*p* approaching .50, $\chi 2$ 95% CI centred around zero, RMSEA values < .05, TLI > .95, and CFI > .95), the 27-item model was tested with and without small variance priors on the cross-loadings. Although all 27-item BSEM models achieved good convergence, the PP*p* indicated a poor fit for both non-informative priors and informative small variance priors on cross-loadings with

zero residual correlations (PP*p* = 0.000, RMSEA = .07). The final 27-model achieved a PP*p* of .52 with informative small variance priors on cross-loadings and residual correlations, indicating a good fit (see Muthén & Asparouhov, 2012). 95% credibility intervals centred around zero and the RMSEA value was .02, indicating a good fit (see Fabrigar et al., 1999). Table 3.4 illustrates a full breakdown of BSEM statistics and convergence scores.

Table 3.4

BSEM Fit Statistics and Convergence, Including PPp and 95% Credibility Intervals

					Difference between observed and replicated $\chi 2$ 95% CI	
BSEM Fit Statistics	PP*p*	RSMEA	CFI	TLI	Lower 2.5%	Upper 2.5%
27-item noninformative	0	.07	.90	.89	1007.00	1132.58
27-item informative priors (cross-loading)	0	.06	.92	.91	726.09	857.62
27-item informative priors (cross-loading + residual correlations)	.52	.02	1.00	.99	-84.09	79.20

Note. BSEM = Bayesian structural equation modelling; PP*p* = posterior predictive *p-value*; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index

All major loadings on the PSTQ were significant (see Table 3.6 for standardised factor loadings and 95% credibility intervals). PSR values for the final 27-item model reached the convergence of between 1.0 and 1.1 at 43,300 iterations. Additionally, visual inspection of the trace plots supported model convergence, with no upward or downward trends in the means and the two chains overlapping in their variability. Estimated correlations for all factors were significant. Estimated correlations for the eight items in the physiological arousal factor ranged between .50 and .75, with all being significant. For the self-perceptions factor, all item correlations were significant and ranged between .47 and .73. All 11 items for the external judgements factor were also significantly correlated and ranged between .63 and .83. Cronbach's Alpha coefficients were calculated to assess the internal consistency of factor items and subscales. Table 3.5 shows inter-factor correlations, means, standard deviations, and Cronbach's Alpha coefficients for PSTQ. Scores were between .83 and .92 for all items and factors indicating good-to-excellent internal consistency. As a high inter-factor correlation of the three-factor PSTQ occurred, the authors reran the data as both two-factor

and single-factor models (see also Study 1). Analysis of the single-factor PSTQ initially revealed a good model fit for the data PP*p* = .52, 95% CI [-81.87, 78.17]. However, all major loadings were non-significant. For two-factor modelling, the combinations tested in Study 1 were used. All two-factor models revealed good PP*p* and 95% CI. However, RMSEA values were above the suggested cut-off value of .05 (see Browne & Cudeck, 1993). Analyses of the single-, two-, and three-factor models indicated that the three-factor model for the PSTQ was most appropriate. Figure 3.2 illustrates a path diagram of BSEM CFA for the final PSTQ.

Sensitivity analyses were performed on the final 27-item PSTQ to determine whether changes in prior variances influenced the factor loadings and cross-loadings. The final model was rerun, specifying prior variances at .005, .01, and .015 for cross-loadings. Results indicated stable factor loadings and cross-loadings for both smaller (.005) and larger (.015) prior variances, with 94% of discrepancies within ± .05. Prior variances of .005 resulted in three items (PA3, PA6, & PA8) incurring discrepancies within ± .09.

Table 3.5

Cronbach's Alpha, Means, Standard Deviations, and Inter-Factor Correlations for the PSTQ

	No. items	Cronbach's alpha	*M*	*SD*	Physiological arousal	Self-perceptions	External judgements
Physiological arousal	8	.84	2.96	.46			
Self-perceptions	8	.83	3.46	.36	.81*		
External judgements	11	.92	3.66	.27	.77*	.90*	

Note. $p < .001$*

Table 3.6

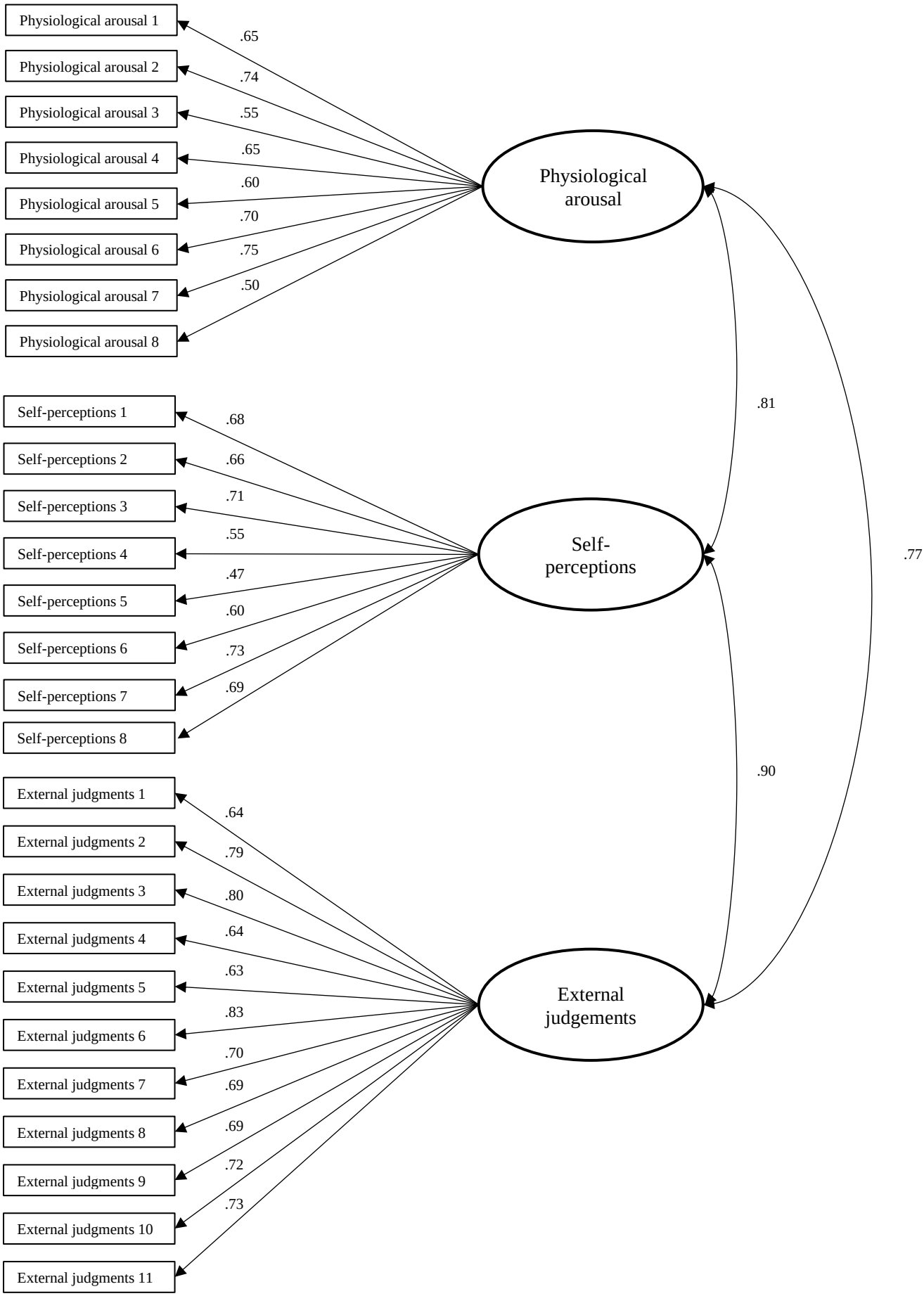
Means, Standard Deviations, and BSEM Standardised Factor Loadings for Each Item, Including 95% Credibility Intervals

Standardised factor loadings for final items	*M*	*SD*	Physiological arousal	Self-perceptions	External judgements
PA1. I worry about having butterflies in my stomach.	3.17	1.13	**.65 [.39, .92]**	.03 [-.17, .22]	.02 [-17, .20]
PA2. My mouth or throat going dry worries me.	3.05	1.19	**.74 [.50, 1.00]**	-.01 [-.20, .17]	.00 [-.19, .17]
PA3. I worry that my voice will tremble when I speak.	3.54	1.16	**.55 [.32, .84]**	.09 [-.11, .28]	.12 [-.07, .30]
PA4. I am worried that I might sweat a lot (i.e., forehead or armpits).	3.09	1.27	**.65 [.35, .94]**	-.02 [-.22, .17]	-.02 [-.21, .17]
PA5. I worry that my face may go red.	3.28	1.34	**.60 [.32, .89]**	.01 [-.18, .20]	.02 [-.18, .21]
PA6. I'm worried that I will be sick.	2.01	1.12	**.70 [.42, .96]**	-.06 [-.25, .13]	-.07 [-.25, .12]
PA7. I'm worried that I won't be able to breathe properly.	2.66	1.22	**.75 [.51, .98]**	.00 [-.19, .19]	-.01 [-.19, .16]
PA8. I worry that I will fidget too much.	2.90	1.16	**.50 [.22, .79]**	.10 [-.10, .29]	.07 [-.11, .25]
SP1. I'm worried that I won't be able to control my anxiety symptoms.	3.56	1.12	.09 [-.12, .25]	**.68 [.41, .95]**	.02 [-.18, .21]
SP2. I worry that I won't be able to get everything across in the given time.	3.40	1.03	-.01 [-.19, .18]	**.66 [.36, .94]**	-.02 [-.22, .17]
SP3. I'm worried about being worried (being in my own head).	3.56	1.16	.01 [-.19, .18]	**.71 [.43, .99]**	-.01 [-.21, .20]
SP4. I worry that I will speak too fast.	3.37	1.10	.02 [-.17, .21]	**.55 [.27, .86]**	-.01 [-.21, .19]
SP5. My voice being too monotonous (one level) worries me.	2.90	1.21	.04 [-.16, .24]	**.47 [.16, .78]**	.00 [-.20, .20]
SP6. Not knowing what to do with my hands and arms worries me.	3.07	1.15	.07 [-.19, .17]	**.60 [.30, .89]**	.01 [-.20, .22]
SP7. I'm worried that I will forget my words (brain freeze).	3.87	1.02	-.01 [-.19, .17]	**.73 [.46, 1.01]**	.03 [-.18, .22]
*SP8. Performing poorly worries me	3.94	0.91	-.06 [-.26, .13]	**.69 [.39, 1.01]**	.09 [-.14, .31]
EJ1. I worry that people will think I'm boring.	3.30	1.16	-.02 [-.20,.16]	.01 [-.19, .22]	**.64 [.37, .91]**
EJ2. I worry about being judged in a negative fashion (e.g., inadequate, inferior, incompetent).	3.87	1.01	-.02 [-.18, .15]	.00 [-.19, .20]	**.79 [.55, 1.02]**
EJ3. I worry that I will embarrass myself in front of the audience.	3.96	1.03	.01 [-.15, .15]	.01 [-.19, .20]	**.80 [.59, 1.04]**
EJ4. I'm worried that the audience will see that I'm nervous.	3.92	0.99	.08 [-.09, .25]	.04 [-.15, .23]	**.64 [.41, .89]**
EJ5. I'm worried that the audience will see me not speaking fluently (e.g., using filler words, ums, errs, etc.).	3.52	1.11	.05 [-.12, .23]	.01 [-.19, .22]	**.63 [.36, .90]**
EJ6. I am worried about the audience seeing me making a mistake.	3.91	0.98	-.05 [-.21, .10]	.01 [-.19, .19]	**.83 [.62, 1.07]**
EJ7. Everyone watching me speak worries me.	3.88	1.12	.03 [-.14, .19]	.04 [-.16, .23]	**.70 [.46, .95]**
EJ8. I worry about getting unexpected responses from the audience (e.g., interruptions).	3.18	1.11	.10 [-.17, .20]	-.02 [-.22, .17]	**.69 [.43, .95]**
EJ9. I worry that someone will ask me a question that I don't know the answer to.	3.70	1.06	-.01 [-.19, .16]	.00 [.20, .20]	**.69 [.43, .93]**
EJ10. Speaking in front of my superiors (e.g., boss, teacher) worries me.	3.57	1.12	.03 [-.14, .21]	-.02 [-.21, .18]	**.72 [.47, .97]**
EJ11. I'm worried about speaking in front of my peers (e.g., colleagues, friends).	3.48	1.11	-.03 [-.21, .15]	.02 [-.18, .21]	**.73 [.47, .99]**

Note. Factor loadings and 95% credibility intervals in bold correspond to the items in each row. * = new item.

Figure 3.2

Path Diagram of BSEM Confirmatory Factor Analysis – Three-Factor Model



Concurrent and Convergent Validity

Table 3.7 presents intercorrelations between all measures. All factors across our measures were mean scored. Correlation values between .51 and 1.0 indicate a high correlation; between .31 and .50, a moderate correlation; and between .10 and .30, a low correlation (Cohen, 1992). The PSTQ physiological arousal, self-perceptions, and external judgements dimensions were all highly correlated with STAIT-5, WES subscales, and RST-PQ BIS, and moderately correlated with the RST-PQ FFFS, indicating good convergent validity (r = .42 – .74, p < .001). Each dimension of the PSTQ demonstrated good concurrent validity with the PRPSA (r = .70 – .80, p < .001). Furthermore, all correlations were positive and significantly related in the expected direction.

Table 3.7

Intercorrelations on Measures of Public Speaking Threat, Public Speaking Anxiety, Fear, Trait, Somatic, and Cognitive Anxiety

Validity	Measure			Correlations (Pearson's *r*)								
		M	*SD*	PSTQ-PA	PSTQ-SP	PSTQ-EJ	FFFS	BIS	STAIT-5	WES-W	WES-E	PRPSA
	PSTQ-PA	2.96	0.83	-								
	PSTQ-SP	3.46	0.74	.81***	-							
	PSTQ-EJ	3.66	0.80	.74***	.87***	-						
Convergent	RSTPQ-FFFS	2.49	0.64	.42***	.45***	.46***	-					
	RSTPQ-BIS	2.59	0.70	.52***	.63***	.61***	.48***	-				
	STAIT-5	2.53	0.81	.50***	.61***	.59***	.43***	.83***	-			
	WES-W	3.44	0.92	.61***	.72***	.74***	.37***	.60***	.55***	-		
	WES-E	3.70	0.97	.68***	.69***	.71***	.41***	.68***	.57***	.75***	-	
Concurrent	PRPSA	3.87	0.65	.70***	.77***	.80***	.41***	.56***	.52***	.72***	.81***	-

Note. N = 709 for all correlations. PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements; PRPSA = Personal Report of Public Speaking Anxiety; RST-PQ = Reinforcement Sensitivity Theory of Personality Questionnaire; FFFS = Fight-Flight-Freeze System; BIS = Behavioural Inhibition System; STAIT-5 = Short Version of the State-Trait Anxiety Inventory-Trait; WES = Worry-Emotionality Scale W= Worry; E = Emotionality. *** = p < .001

Gender Differences

To test for gender differences in physiological arousal, self-perceptions, and external judgements threats, an independent t-test was conducted. Significant differences were observed in all dimensions. For the physiological arousal dimension, women (M = 3.15; SD = .81) scored significantly higher than men (M = 2.77; SD = .80), $t(703) = -6.35$, $p < .001$. For the self-perceptions dimension, women (M = 3.61; SD = .68) scored significantly higher than men (M = 3.31; SD = .77), $t(703) = -5.50$, $p < .001$. For the external judgements dimension, women (M = 3.86; SD = .72) scored significantly higher than men (M = 3.47; SD = .83), $t(703) = -6.53$, $p < .001$. Analysis of the remaining outcome measures revealed significant gender differences, with women scoring higher than men. See Table 3.8 for a full breakdown of scores.

Table 3.8

Independent Samples T-Test Showing Gender Differences in Outcome Measures

Measure	Male (n = 356)		Female (n = 349)			
	M	*SD*	*M*	*SD*	*t*	*p*
PSTQ-PA	2.77	.80	3.15	.81	-6.35	< .001
PSTQ-SP	3.31	.77	3.61	.68	-5.50	< .001
PSTQ-EJ	3.47	.83	3.86	.72	-6.53	< .001
PRPSA	3.70	.70	4.05	.54	-7.46	< .001
STAIT-5	2.43	.80	2.62	.80	-3.17	< .01
RSTPQ-FFFS	2.28	.60	2.69	.62	-8.84	< .001
RSTPQ-BIS	2.49	.70	2.68	.69	-3.69	< .001
WES-W	3.28	.94	3.60	.86	-4.70	< .001
WES-E	3.45	1.02	3.97	.85	-7.32	< .001

Note. N = 709. PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements; PRPSA = Personal Report of Public Speaking Anxiety; RSTPQ = Reinforcement Sensitivity Theory of Personality Questionnaire; FFFS = Fight-Flight-Freeze System; BIS = Behavioural Inhibition System; STAIT-5 = Short Version of the State-Trait Anxiety Inventory-Trait; WES = Worry-Emotionality Scale W= Worry; E = Emotionality. *** = $p < .001$

Age Correlations

Pearson correlation coefficients were calculated to determine the relationship between age and PSTQ dimension scores. No significant correlations were observed.

Discussion

The purpose of this study was to further validate the PSTQ with a second independent sample and test its criterion validity against well-established relevant questionnaires. Confirmatory factor analysis through BSEM provided further support for the validation of the PSTQ, with the 27-item model achieving a good model fit. Furthermore, the PSTQ had good to excellent internal consistency for all dimensions (physiological arousal, α = .84; self-perceptions, α = .83; external judgements α = .92), and good concurrent and convergent validity. The strongest correlations observed were between the PRPSA and PSTQ dimensions of self-perceptions (*r* = .77) and external judgements (*r* = .80). As both measures focused on public speaking situations, this was expected. Further, the worry subscale of the WES had stronger correlations with the self-perceptions (*r* = .72) and external judgements (*r* = .74) dimensions compared to the physiological arousal (*r* = .61) dimension. As hypothesised, the physiological arousal dimension had a stronger correlation with the WES-E (*r* = .68) than with the WES-W (*r* = .61). Both the self-perceptions and external judgements dimensions had stronger correlations with the WES-W (*r* = .72 & .74) compared to the WES-E (*r* = .69 & .71). As expected, the PSTQ dimensions achieved only a moderate correlation with the RSTPQ-FFFS (*r* = .42 - .46).

While inter-factor correlations were high (.77 – .90), further analyses determined that the three-factor PSTQ was the most appropriate model for measuring public speaking threats. Although some variation in item loadings between studies was expected, several item loadings were much lower in Study 2 than in Study 1. In the physiological arousal dimension, PA3 *("I worry that my voice will tremble when I speak"*) reduced from .82 to .55 and PA8 ("*I worry that I will fidget too much"*) reduced from .73 to .50. In the self-perceptions dimension, SP4 (*"I worry that I will speak too fast"*) and SP5 *("My voice being too monotonous [one level] worries me"*) reduced from .76 to .55 and .67 to .47, respectively.

Whilst an explanation for this change is potentially due to the larger sample size, the item loadings were still significant and above the acceptable cut-off of .40 (see Stevens, 1992).

Study 2 provides further evidence to support the validity of the PSTQ. However, further investigation is required to address the reliability and predictive validity of the PSTQ. Therefore, test-retest reliability was conducted on the same participants over a 21-day period. Correlation and regression analyses between the PSTQ and academic performance were conducted to determine its predictive validity. As academic performance is disrupted by academic anxiety, of which PSA is a core component (Boath et al., 2017), we hypothesise that PSTQ dimension scores will negatively correlate with academic performance. Finally, owing to the nature of academic settings in which public speaking skills are practiced, we should see a significant reduction in PSA across time. That is, the longer a student has been imbedded within an academic setting the lower their PSA scores should be. Therefore, we hypothesise that with every year students continue with their studies, PSA scores will significantly decrease.

Study 3

Method

Participants and Procedure

After obtaining university ethical approval and obtaining informed written consent, 131 undergraduate students from a UK university (81 men, 50 women, M_{age} = 20.16 years, *SD* = 2.56 years) were recruited for the study. All participants were white, and the final sample consisted of 52 1st year (39.7%), 34 2nd year (26%), and 45 3rd year (34.4%) students. Participants completed the 27-item Public Speaking Threats Questionnaire (PSTQ) from Study 2 during the second half of the first semester (i.e., early November) at two time points three weeks apart. The questionnaire was completed in person, in a pen-and-paper format. Participants were debriefed upon completion of the study. While all participants completed the PSTQ at Time Point 1, only 77 participants completed the questionnaire at Time Point 2.

Results

Test-Retest Reliability

Following the recommendations of Koo and Li (2016), intraclass correlation coefficients (ICC) were calculated to determine test-retest reliability. In the analyses, an average measurement, 2-way mixed effects model with absolute agreement was used. ICC values > .9 indicate excellent reliability, between .75 and .9 indicate good reliability, between .5 and .75 indicate moderate reliability, and < .5 indicate poor reliability (see Koo & Li, 2016; Portney & Watkins, 2015). For this analysis, we only included participants who completed the PSTQ at both time points (n = 77).

Mean physiological arousal scores for the total sample were 2.57 (SD = .88) at Time 1 and 2.63 (SD = .89) at Time 2. Mean self-perceptions scores for the total sample were 3.02 (SD = .81) at Time 1 and 3.07 (SD = .81) at Time 2. Mean external judgements scores for the total sample were 3.04 (SD = .88) at Time 1 and 2.94 (SD = .88) at Time 2. ICC values were .83 (95% CI = .73 - .89) for physiological arousal, .83 (95% CI = .74 - .89) for self-perceptions, and .88 (95% CI = .81 - .92) for external judgements, indicating good test-retest reliability. See Table 3.8 for a breakdown by academic year.

To assess the internal consistency, Cronbach's alpha coefficients were calculated (Cronbach, 1951). Table 3.8 shows factor subscale means, standard deviations, and Cronbach's Alpha coefficients for each year and the total sample. Scores for the total sample were between .85 and .93 for all factors at Time 1 and between .85 and .94 at Time 2, indicating good-to-excellent internal consistency.

Table 3.9

Cronbach's Alpha, Means, Standard Deviations for the PSTQ

Measure	Group	*n*	Time 1			Time 2			Correlations (ICC)
			M	*SD*	Cronbach's Alpha	*M*	*SD*	Cronbach's Alpha	
PSTQ-PA	Year 1	30	2.53	.96		2.78	.83		.75
	Year 2	18	2.53	.74		2.41	.98		.78
	Year 3	29	2.63	.91		2.63	.90		.94
	Total	77	2.57	.88	.87	2.63	.89	.89	.83
PSTQ-SP	Year 1	30	2.93	.99		3.12	.77		.89
	Year 2	18	3.13	.56		2.90	.87		.59
	Year 3	29	3.06	.75		3.14	.81		.88
	Total	77	3.02	.81	.85	3.07	.81	.85	.83
PSTQ-EJ	Year 1	30	3.07	1.03		3.12	.85		.90
	Year 2	18	2.89	.73		2.61	.91		.80
	Year 3	29	3.11	.83		2.96	.87		.89
	Total	77	3.04	.88	.93	2.94	.88	.94	.88

Note. PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements; Year 1 = 1st year at UK University; Year 2 = 2nd year at UK University; Year 3 = 3rd year at UK University. $p < .05$*, $p < .01$**, $p < .001$***

University Experience and Public Speaking Threats

To test our hypothesis that PSTQ scores would decrease over time in academic settings, a one-way MANOVA was conducted. PSTQ scores at Time 1 were used in this analysis. There were no significant differences in the combined PSTQ scores (physiological arousal, self-perceptions, and external judgements) based on academic year, Wilks' $\Lambda = .94$, $F\ (6, 252) = 1.34$, $p > .05$, $\eta^2 = .03$, observed power = .53. Furthermore, there was no significant effect of academic year on physiological arousal dimension scores, $F(2,128) = .34$, $p > .05$); self-perceptions dimension scores, $F(2,128) = .84$, $p > .05$); or external judgement dimension scores, $F(2,128) = 1.30$, $p > .05$).

Predictive Validity

To assess the predictive validity hypothesis that undergraduates with high PSTQ scores would have lower academic performance, correlation and multiple regression analyses were conducted to explore the relationship between end of year grades, age, gender, and PSTQ dimension scores. As the PSTQ was assessed in the middle of semester 1, end of

current year grades were as yet unavailable. Therefore, we used the PSTQ scores at Time 1 as the predictor variable and students' end of year overall grade (ranging from 0% to 100%) from their previous year of study as the outcome variable. We also separately analysed the scores by year group.

As Year 1 students did not have any previous academic data to use, they were omitted from this analysis. Furthermore, we were unable to retrieve academic data for seven students. This resulted in a final sample size of 72 students. Significant moderate positive correlations were observed for Year 3 between academic performance and the physiological arousal (r = .35, $p < .05$), self-perceptions (r = .33, $p < .05$), and external judgements dimensions (r = .39, $p < .01$). These findings suggest that for 3rd year university students, as perceptions of public speaking threats increase, academic performance increases. A point-biserial correlation was run between academic performance and gender. A significant moderate positive correlation was observed, $r_{pb}(39) = .36$, $p < .05$, with women (M = 66.5, SD = 3.10) scoring higher in academic performance than men (M = 58.56, SD = 1.76). Gender accounted for 13% of the variability in academic performance scores. No significant correlation was observed for age.

Year 2 failed to show any significant correlation between academic performance and PSTQ dimensions, gender, or age. Multiple regression analyses revealed that gender, age, and PSTQ dimension scores did not significantly predict academic performance for Year 2 or Year 3 ($p > .05$). Correlations and regression coefficients can be found in Table 3.10 and Table 3.11. Although multiple regression revealed no significant relationships, the simple correlations indicated that PSTQ scores were positively related to academic performance for 3rd year university students.

Table 3.10

Intercorrelations, Means, Standard Deviations for the PSTQ and Academic Performance

Group	Measure	*n*	*M*	*SD*	Correlations (Pearson's *r*)			
					PSTQ-PA	PSTQ-SP	PSTQ-EJ	AP
Year 2	PSTQ-PA	31	2.39	.72	-			
	PSTQ-SP	31	3.00	.98	.42*	-		
	PSTQ-EJ	31	2.72	.72	.80***	.52**	-	
	AP	31	62.93	8.01	-.27	-.20	-.10	-
Year 3	PSTQ-PA	41	2.39	.79	-			
	PSTQ-SP	41	2.83	.70	.82***	-		
	PSTQ-EJ	41	2.93	.82	.75***	.77***	-	
	AP	41	61.66	10.93	.35*	.33*	.39*	-

Note. $N = 72$; PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements. AP = Academic Performance; Year 2 = 2nd year at UK University; Year 3 = 3rd year at UK University. $p < .05$*, $p < .01$**, $p < .001$***

Table 3.11

Multiple Regression Analysis Results: Age, Gender, PSTQ Dimension Scores Upon Academic Performance

Group	Variables entered	R^2	R^2_{cha}	F_{cha}	*df*	β	95% CI for β		*SE*	*t*
							LL	*UL*		
Year 2	*Model 1*									
	Age					.47	-.79	1.73	.61	.77
	Gender	.095	.095	1.465	2, 28	-4.38	-10.34	1.58	2.91	-1.50
	Model 2									
	Age					.315	-1.00	1.63	.64	.49
	Gender					-3.87	-10.54	2.80	2.24	-1.20
	PSTQ-PA					-4.24	-11.60	3.11	3.57	-1.19
	PSTQ-SP					-1.26	-4.89	2.37	1.76	-.71
	PSTQ-EJ	.192	.097	0.999	3, 25	2.38	-5.76	10.52	3.95	.60
Year 3	*Model 1*									
	Age					.07	-1.24	1.38	.65	.11
	Gender	.129	.129	2.816	2, 38	-7.97*	-14.77	-1.17	3.36	-2.37
	Model 2									
	Age					.18	-1.16	1.52	.66	.27
	Gender					-4.31	-12.89	4.26	4.22	-1.02
	PSTQ-PA					1.77	-6.16	9.70	3.90	.45
	PSTQ-SP					-.07	-9.35	9.21	4.57	-.015
	PSTQ-EJ	.185	.056	.80	3, 35	2.47	-5.20	10.15	3.78	.65

Note. PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements; ; Year 2 = 2nd year at UK University; Year 3 = 3rd year at UK University. $p < .05$*

Gender Differences

To test for gender differences in physiological arousal, self-perceptions, and external judgements threats, an independent t-test was conducted. Significant differences were observed in all dimensions. For the physiological arousal dimension, women ($M = 2.62$; $SD = .78$) scored significantly higher than men ($M = 2.23$; $SD = .82$), $t(129) = 2.75$, $p < .01$. For the self-perceptions dimension, women ($M = 3.08$; $SD = .72$) scored significantly higher than men ($M = 2.65$; $SD = .86$), $t(129) = 2.92$, $p < .01$. For the external judgements dimension,

women (M = 3.25; SD = .82) scored significantly higher than men (M = 2.59; SD = .86), $t(129) = 4.32$, $p < .001$. Follow-up analyses were performed to determine differences between gender for each year group. For Year 2, women scored significantly higher than men on the physiological arousal dimension, $t(32) = 2.76$, $p < .05$. For Year 3, women scored significantly higher than men on the physiological arousal dimension, $t(43) = 2.05$, $p < .05$; the self-perceptions dimension, $t(43) = 2.24$, $p < .05$; and the external judgements dimension, $t(43) = 3.91$, $p < .001$. No significant differences were observed for Year 1. Finally, a two-way MANOVA was conducted to determine whether there were any significant differences in PSTQ scores based on academic year and gender. No significant differences in the combined PSTQ or dimension scores were observed ($p > .05$).

Age Correlations

Pearson correlation coefficients were calculated to determine the relationship between age and PSTQ dimension scores. No significant correlations were observed.

Discussion

The purpose of this final study was to determine the test-retest reliability and predictive validity of the PSTQ in a third independent sample. Results confirmed that the PSTQ had good test-retest reliability (ICC values between .83 and .88), along with excellent internal consistency for all dimensions. Regarding predictive validity, although the regression analyses were not significant, a significant moderate positive correlation was found between academic performance and PSTQ dimension scores for Year 3. This finding suggests that the more worried a student is about public speaking, the higher their academic grades will be. No significant correlations were observed for Year 2. We failed to find any evidence to support our hypothesis that PSTQ scores would decrease over time in academic settings. Lastly, we explored gender differences in PSTQ scores. Echoing the results of Study 1 and Study 2, this study found that women scored significantly higher in all PSTQ dimensions compared to men.

General Discussion

One of the limitations of existing PSA questionnaires is that they fail to identify the specific threatening stimuli that may be causing the anxiety response. Instead, they focus on determining the intensity of a person's anxiety. This disregard for identifying sources of perceived threat risks intervention effectiveness (see LeFebvre et al., 2018). To rectify this limitation, we set out to create and validate a new model for the identification and categorisation of public speaking threats. Another goal of this research was to explore whether the sources of public speaking threats reduced in their saliency across time in university settings. We also explored whether anxiety generated from public speaking threats predicted end-of-year grade performance. Study 1 (n = 248) focused on item development of the Public Speaking Threats Questionnaire (PSTQ), resulting in a three-factor, 26-item model. Study 2 further validated a lightly revised model (27 items) using a second, larger sample (n = 709), further demonstrating excellent internal validity and good criterion validity. Study 3 illustrated good test-retest reliability and predictive validity for a third sample (n = 131). It also highlighted the shortcomings of the current university experience in reducing PSA.

PSTQ Model

Results from the PSTQ Bayesian statistical analysis revealed a 27-item measure comprising three dimensions: physiological arousal (eight items), self-perceptions (eight items), and external judgements (11 items). Although a five-factor model (physiological arousal, self-perceptions, performance judgements, content judgements, audience concerns) was initially hypothesised for the PSTQ, the BSEM analyses of Study 1 failed to find any evidence to support it. Instead, the results from Study 1 and Study 2 provided evidence to support a three-factor model. The physiological arousal dimension encompasses the voluntary and involuntary physiological manifestations concerning public speaking (i.e., increased heart rate, trembling) which may be appraised as a threat to performance. The self-

perceptions dimension comprises perceptions an individual has concerning themselves (e.g., their perceived lack of attributes or proficiencies) that are appraised as threats. Finally, the external judgements dimension contains performance judgements (threats of negative evaluation of performance from the audience) and audience concerns (a generalised perception of threat from being observed by an audience).

The ability to identify specific public speaking threats is essential in the therapeutic process. It compartmentalises the overwhelming generality of the threat (e.g., public speaking situations) into manageable, specific threats that can be targeted (e.g., fear of forgetting my content) and overcome. Unfortunately, this area has seen limited exploration across the PSA literature, with most research focusing only on determining the overall level of PSA. Although a determination of overall PSA is important, it is only one piece of the therapeutic puzzle. The development of the PSTQ will allow future research to conduct targeted interventions and improve treatment efficacy.

Item Wording

Although many terms have been used to describe threats related to public speaking (e.g., anxious, worried, scared, apprehensive), the authors decided for simplicity to use the term ‘worried’ and its variations in all items. It could be argued that using the term ‘worried’ focuses solely on cognitive processes; however, as we are determining specific ‘threats’, all of which are likely to be processed through the cognitive appraisal system (Lazarus & Folkman, 1984), the term worried was most appropriate. Furthermore, although this model focused specifically on the construct of public speaking threats, items were designed to allow for adaptation across multiple domains and various performance settings (e.g., acting, singing, dancing, and sports). For example, in acting settings the item “Generally, everyone watching me speak worries me” would be changed to “Generally, everyone watching me act worries me.”

Trait Measure

One reason why we used a trait approach to PSA is that we were able to collect data from a much larger sample than if we used a state approach. Although it would be easy to convert the PSTQ to a state measure (e.g., “How do you feel right now with regards to this upcoming presentation”), using the state approach would have meant testing the PSTQ on hundreds of students immediately before an upcoming presentation. The time required to conduct such a study would be challenging for the purposes of this thesis.

However, it is also important to identify these trait PSA beliefs because of their influence on state anxiety. For example, individuals with high trait anxiety are predisposed to have an attentional bias toward threats (Bar-Haim et al., 2007; Elwood et al., 2012), enhanced memory of threatening information (Mitte, 2008), impaired ability to inhibit distracting information (Pacheco-Unguetti et al., 2010), and lower cognitive flexibility (Wang et al., 2019). Regarding public speaking, high trait anxiety increases the probability of a person experiencing PSA before or during any verbal presentation, regardless of the situation, audience, or context. Although not tested, we hypothesise that students with high levels of trait PSA would respond to public speaking events with high levels of state PSA. The PSTQ addresses the limitations of previous measures by providing a tool to identify the specific public speaking threats and their respective intensities.

Applied Implications

In certain organisations (e.g., universities and businesses), there may be tens, hundreds, or even thousands of people who suffer from high levels of PSA. Therefore, finding an expeditious methodology to assess and group individuals for treatment is of paramount importance. Applied practitioners and coaches can use the PSTQ to reduce assessment time (owing to its brevity) and increase treatment efficacy through targeted approaches (e.g., not wasting time on breathing exercises if a person’s threat is related to concern over making mistakes).

Factor scoring could allow for the creation of a 'firing order', enabling both individuals and applied practitioners to determine the areas that require the greatest initial focus. In situations where large numbers need to be assessed and treated (e.g., universities and businesses), participants will typically receive a one-size-fits-all intervention (e.g., Buttelmann & Römpke, 2014; Fitch et al., 2011). However, when individual differences are not considered, intervention efficacy is at risk. To address this limitation, applied practitioners can use the PSTQ to group people by the highest scoring dimension and provide tailored interventions. For example, in a group of 100 students, 20 may score highest on the physiological arousal dimension, 30 on the self-perceptions dimension, and the remaining 50 on the external judgements dimension. Specific interventions for those who feel threatened by high levels of physiological arousal could be breathing therapy (Dİncer et al., 2022), doppel device (Azevedo et al., 2017), or distraction tasks (Buttelmann & Römpke, 2014). Those who feel threatened by self-perceptions could receive skills training (Pribyl et al., 2001) or high-power priming (Schmid & Mast, 2013). Similarly, those who feel threatened by external judgements may benefit from visualisation therapy (Ayres & Ayres, 2003), exposure therapy (Finn et al., 2009), or virtual reality therapy (VRT; Heuett & Heuett, 2011).

Theoretical Implications

Several theoretical implications have arisen from these studies and are thus worth discussing. Study 2 reported strong positive correlations between PSTQ dimension scores and measures of public speaking anxiety, trait anxiety, somatic anxiety, and cognitive anxiety. Previous research has highlighted the facilitative and debilitative effects of anxiety on performance (see Eysenck et al., 2007; Hardy, 1990). High PSTQ dimension scores relate to the potential loss of attentional control. Each item acts as a potential distractor, diverting cognitive resources from task-relevant cues (e.g., recalling content) to task-irrelevant cues (e.g., worrying about audience judgements), decreasing performance. Furthermore, as

increases in PSTQ scores correlate with increases in cognitive anxiety, the probability of a performance or social performance catastrophe occurring also increases.

Study 3 provided initial evidence of the PSTQ's ability to predict academic performance. Alongside overall academic grades, the PSTQ could be used to predict performance outcomes in situations such as academic modules requiring public speaking components, sales pitches, and interview presentations. Furthermore, the adaptation of the measure to other domains (e.g., sports, performing arts) allows for its use in the potential forecasting of performance outcomes.

University Experience

The results of Study 3 indicate that university experience does not reduce anxiety-related reactions to public speaking threats over time. This was contrary to what we originally hypothesised. Although we used a trait measure, which is difficult to shift over time, we would expect that repeated exposure to public speaking situations should decrease public speaking threat scores over a three-year period. This brings to light the potential issue of universities not doing enough to support students in their presentation and public speaking skills development.

The ability to speak confidently and competently in public is considered to be a critical employability skill for graduates (Dunbar et al., 2006; Selvadurai et al., 2012). Not only is it required in the initial interview stage, but subsequently once employed to effectively communicate with external partners, customers, and internally with fellow employees. Çagatay (2015) argued that to reduce students' overall levels of PSA, universities should provide students with real-life situations and opportunities to speak in public. Although this is needed, we argue that universities should also invest in the development of public speaking skills for students. This will help to increase public speaking competency and self-efficacy. As discussed in Chapter 2, these exposure-based opportunities can occur in vitro, via virtual reality, or in vivo. Furthermore, to improve efficacy, exposure experiences

should be graded, and habituation should be ensured at each level before students advance to the next stage.

Regarding academic performance, we expected to see a negative correlation between PSTQ dimension scores and academic performance. However, Year 3 had a moderate positive correlation between PSTQ dimension scores and academic performance, indicating that as PSTQ scores increased, so did academic performance. Although non-significant, Year 2 showed a moderate negative correlation between PSTQ dimension scores and academic performance. This difference in direction between Year 2 and Year 3 could be due to the pressure changes individuals face as they progress through the university. For example, Year 2 academic performance accounts for 33% of their final undergraduate degree, whereas Year 3 accounts for 67%.

Throughout the literature there has been conflicting evidence showing the positive and negative relationships between anxiety and performance. Our findings for Year 3 are consistent with the positive relationships observed in the literature (e.g., Monrad et al., 2021; Theobald et al., 2022). Conversely, although non-significant, the results for Year 2 are consistent with studies reporting negative relationships between anxiety and performance (e.g., von der Embse et al., 2018). However, as we used a trait measure and a state measure may produce different results, further research is warranted to explore this phenomenon in greater detail.

Gender and Age Differences

Significant gender differences were observed across the three studies. Women reported significantly higher PSTQ scores in all dimensions compared to men. Furthermore, there were no significant differences between dimension scores, indicating that women find physiological arousal, self-perceptions, and external judgements threats to be equally salient. Our findings are consistent with previous research exploring the relationship between gender and PSA (Behnke & Sawyer, 2000) and SAD (Asher et al., 2017). Understanding gender

differences is important, not only for academic settings, but also for post-university life. The avoidance behaviours commonly associated with anxiety could explain why there is lower female visibility in academic settings (De Paola et al., 2021) and gender gaps in workplaces (Niederle & Vesterlund, 2007; Shurchkov, 2012). Finally, across all three studies, no significant correlations were observed between age and PSTQ dimension scores. Our findings are contrary to those of previous research, which found that as people get older, anxiety levels are typically lower (Chaudhary et al., 2023; Jorm, 2000; Machado et al., 2019).

Limitations and Future Directions

This study is not without limitations. First, while the use of a convenience sample is commonplace in psychological research, utilising the website prolific resulted in potential sampling bias. Although we achieved equal representative demographics for gender and age, 88% of the sample was white and 63% were employed. Studies 1 and 2 may have produced alternative findings if the sample data had more representative demographic characteristics. Future studies should target specific populations (e.g., university students, business, actors), and utilise larger sample sizes and representative demographics to further assess reliability and predictive validity (e.g., pre-state anxiety, attentional control). Study 3 provided evidence to suggest that university experience does little to reduce trait public speaking threat levels over a three-year period, as scores across the different year groups remained stable. However, a limitation of this study was that we did not assess the same group across the three years. Therefore, future research should conduct longitudinal studies to assess the impact of standardised educational experience (e.g., university, apprenticeships) on PSA and whether it is adequate. Another limitation of Study 3 was the use of overall academic grades, instead of specific assessments that required public speaking. Future studies should use academic data from assessments that contain only verbal components. Future research should also utilise the PSTQ to group individuals based on dimension scores, providing more tailored intervention approaches, and potentially increasing treatment efficacy. Finally, owing to logistical

complexities (e.g., the inability to conduct public speaking tasks immediately after questionnaire completion), the current model only assessed trait beliefs. Further research should explore the creation of a state version of the PSTQ and its direct relationship to performance.

Conclusions

The findings of these studies provide initial evidence that the 27-item PSTQ has good psychometric properties. The PSTQ allows for both the identification of specific threats related to public speaking and the categorisation of said threats into the dimensions of physiological arousal, self-perceptions, and external judgements. The time-consuming element of clinical interviews is one of their major drawbacks, however, the PSTQ provides applied practitioners with a simple measure to identify key areas of threat in a fraction of the time. This time-saving benefit is particularly relevant for large groups (e.g., universities and businesses). The authors recommend the use of the PSTQ as a screening process and as a tool to increase the expediency of the clinical interview process. Furthermore, this allows for the tailoring of interventions aimed at reducing threats related to public speaking, thereby increasing their efficacy and effectiveness. This measure will benefit research by providing a psychometrically sound instrument that can provide good data for both diagnostic and tracking purposes. Alongside the generation of the PSTQ, this paper advances the theoretical perspective from a generalised and interchangeable view of public speaking anxiety (PSA) and fear of public speaking (FoPS) to one where PSA and FoPS are related but distinct entities.

Chapter 4: The Improv Self-Efficacy and Skills Program (ISESP)

Abstract

Public speaking fear and anxiety are commonplace both in occupational and educational settings. Although numerous treatments are available to reduce both fear and anxiety, public speaking issues persist, particularly in university environments. One particular treatment that may reduce public speaking anxiety is via actor and improvisation theatre training. Actor and improvisation training involves the development of verbal and non-verbal communication skills, along with the regular exposure to social performance situations in a graded format. Previous research has demonstrated its potential to reduce the negative impact of anxiety and fear on individual and performance outcomes. Therefore, the purpose of the present study was to determine the effectiveness of the Improv Self-Efficacy and Skills Program (ISESP), an innovative intervention rooted in the principles of acting and improvisational theatre training upon public speaking anxiety in a sample of university students. The experimental group (n = 11) received 12 hours of training over three weeks (6 x 2 hr) and the waitlist control group (n = 11) received a ½ day version of the program (3 hr) after the 6-month follow-up. The results indicated that participation in the ISESP led to significant reductions in public speaking anxiety, discomfort, physiological arousal threats, and self-perception threats, along with increases in self-efficacy and speech duration. Although the ISESP group demonstrated greater improvements in all outcome measures compared to the wait-list control group at post-test, between-group statistical significance was not achieved. Results were maintained at 6-month follow-up.

Keywords: public speaking anxiety, fear of public speaking, self-efficacy, theatrical improvisation

Introduction

Public speaking is a frequently required skill in both educational and occupational settings. Public speaking in the form of verbal presentations is an especially important skill for university students to disseminate their understanding of new knowledge and is a key attribute for future employment. However, it is a situation that often elicits fear and anxiety. For example, Russell and Topham (2012) found that 80% of university students reported oral presentations as a source of social anxiety that negatively impacted learning and well-being. Marinho et al. (2016) found that 63.9% of undergraduates fear public speaking, while Grieve et al. (2021) found public speaking anxiety had detrimental effects on students' university experiences. Furthermore, public speaking anxiety has been shown to reduce overall performance outcomes in many domains via diminished critical thinking skills in group discussions, hindered ability to focus, reduced clear thinking, and poorer articulation of speech (Blume et al., 2010; Hofmann et al., 1997; Voncken & Bögels, 2008). From an institutional perspective, these statistics are concerning. However, research has reported that 89.3% of students desire classes to improve their public speaking skills (Marinho et al., 2016).

Conceptual Clarity

The conceptual clarity of public speaking is a limitation observed throughout the psychological literature. While many terms are used synonymously to denote the act of speaking in public (e.g., public speaking, oral presentation, verbal presentation), their definitions and content vary. Therefore, to reduce ambiguity and expand on Guest's (2018) definition, the authors propose a working definition of public speaking as "a form of oral communication, typically assessed and in front of one or more persons, that tends to be uni-directional, (semi-)formal and has specific verbal and non-verbal components." In addition, Chapter 2 highlighted a lack of differentiation between the constructs of public speaking anxiety (PSA) and fear of public speaking (FoPS), with many studies utilising anxiety

measures when their focus was on fear, and vice versa (e.g., Wallach et al., 2009). To reduce said ambiguity, this article will focus solely on PSA and use Chapter 3's definition, defining it as "a situation-specific social anxiety that arises from actual, anticipated, or imagined delivery of a speech in front of others." To distinguish it from other anxiety disorders, an audience must be considered (real or imagined).

Current Research and Limitations

There appear to be a varied number of available treatments that aim to reduce PSA levels. The systematic review and meta-analysis reported in Chapter 2 revealed that effective interventions utilised exposure-based strategies, cognitive-based strategies, or a combination of both. Furthermore, interventions focused on reducing symptoms or targeting sources of anxiety and featured single or multiple treatment sessions.

Exposure-based strategies focus on providing individuals with opportunities to be gradually exposed to fearful stimuli (i.e., public speaking). This occurs with the person either imagining the experience (e.g., visualisation; Ayres & Ayres, 2003) or being directly exposed to it (e.g., exposure therapy; Finn et al., 2009). Often, these opportunities were used alongside cognitive modification strategies. Several meta-analyses have highlighted the use of virtual reality exposure therapy (VRET) as an equally effective method to traditional in vivo exposure therapies (Horigome et al., 2020; Reeves et al., 2022).

Cognitive-based strategies target maladaptive thought processes and aim to replace them with more realistic balanced alternatives. Chapter 2 found that this occurred by either attempting to reduce the saliency of threats, such as eye movement desensitisation and reprocessing (Aslani et al., 2014); altering a person's perception of the situation, for example, communication-orientation motivation therapy (Ayres et al., 2000); or determining the source of a person's anxiety and challenging it (e.g., Cunningham et al., 2006).

Momentary interventions aimed at reducing the symptoms of anxiety included alcohol consumption (Abrams et al., 2001) and pre-speech distractors, such as animals and plants

(Buttelmann & Römpke, 2014). Although effective in the short-term, the long-term effects remain unclear and perhaps variable. By contrast, interventions that require a more extensive understanding of a person that targets the source of anxiety may provide greater long-term benefits (e.g., Cunningham et al., 2006). Many of the interventions included in Chapter 2 also varied in terms of the time required for completion. The shortest treatment lasted for only 30 seconds (Brandrick et al., 2020), whereas the longest took 45 hours to complete and was delivered over the course of a year (Pribyl et al., 2001).

While all studies included in Chapter 2's review and meta-analysis were effective, several limitations were observed. Of the 26 studies included in their review, only 42% utilised a public speaking component pre-and post-test, and 23% lacked any form of public speaking at all. Without pre- and post-tests including a public speaking component, it is difficult to determine the real-world implications of the research. Another limitation was the overreliance on the Personal Report of Communication Apprehension (PRCA: McCroskey, 1985). The PRCA is a 24-item, four-factor model measuring communication apprehension in four domains (group, meeting, interpersonal, and public speaking). Studies utilising the PRCA either relied on the sum of the four dimensions or only reported the public speaking dimension. Overreliance on the sum of the four dimensions ignored individual differences and may have led to false positives. That is, public speaking dimension scores may have remained unchanged despite a reduction in total PSA score. For studies reporting on the public speaking dimension only, due to the limited number of items (i.e., six), McCroskey (2005) argued that it is substantially less reliable than using sum scores. Therefore, research suggests that those interested in only public speaking anxiety scores should utilise the 34-item Personal Report of Public Speaking Anxiety (PRPSA; McCroskey. 1970) instead of the PRCA (McCroskey, 2005).

A final limitation of the PSA interventions research was the lack of exploration of the development of public speaking self-efficacy (Bandura, 1977). That is, although most of the

research found in Chapter 2 focused on reducing anxiety, this comes at the expense of providing the necessary skills to allow for the development of public speaking self-efficacy. Perhaps research has favoured this option, as prevention seems more difficult to implement than a transitionary cure.

Acting and Improvisational Theatre Training

Although many traditional treatments exist for the reduction of PSA, problems persist. Therefore, it is important to explore alternative treatment methodologies to evaluate their efficacy. To this end, the current chapter explores an alternative intervention based upon techniques from acting on stage to reduce PSA and increase public speaking self-efficacy. Both public speaking and acting typically involve the memorisation and subsequent repetition of a script and the use of verbal and non-verbal communication methods. Typical actor training develops a person's verbal and non-verbal communication skills and provides multiple opportunities to perform under pressure (e.g., to an audience). Due to the parallels with traditional PSA interventions (e.g., skills training or exposure therapy), an exploration of actor training is of value not only for the reduction of PSA, but also for the development of public speaking skills and public speaking self-efficacy. This is also an area that has undergone limited exploration.

Modern theatre training has been heavily influenced by the work of Constantin Stanislavski. In his book *An actor prepares*, Stanislavski presents a system of techniques that an actor must undergo in order to be fully prepared for a role (Stanislavski, 2013). While a complete discussion of his system is beyond the scope of this article, two techniques that are relevant to public speaking "concentration" and "physical apparatus" are discussed here. Stanislavski was concerned that actors might become distracted by the audience (e.g., task-irrelevant cues) during a performance. While a denial of the audience's presence was not possible, he believed that if a person was sufficiently interested in something other than the audience, then the audience would not be a distractor. In this way, attentional control

parallels the work of Eysenck et al. (2007) on attentional control theory (ACT). ACT posits that increases in anxiety leads to reduced executive function (i.e., reduced inhibition) which increases the tendency of anxious individuals to be distracted by threatening stimuli. In the case of public speaking, if speakers have poor attentional control, they may shift their attention from task-relevant cues (e.g., presentation content) to task-irrelevant cues (e.g., audience reactions), thereby threatening effective performance. Stanislavski believed that vocal and physical training should be at the core of an actor's development as audiences have come to watch a performance and want to see and understand what is being shown. Transferring this to public speaking highlights the importance of training vocal and physical skills to not only enhance performance but also respect the audience.

Improvisation

Theatrical improvisation, a subset of acting, is "the skill of getting up on stage and making stuff up as you go along" (Napier, 2013, p. 1). Although it has been a performance medium for hundreds of years, it has recently gained widespread popularity with TV shows, such as *"Whose Line is it Anyway?"* and the theatrical performances of Austentatious and Showstoppers. Voila Spolin and Keith Johnstone were two pioneers of theatrical improvisation. In the 1930s, Spolin began using improvisation exercises in education and psychology as a means to excite individual expression (Spolin, 1963). In the following years, Johnstone created his own system aimed at encouraging spontaneity and collaborative creation using imagination and intuition (Johnstone, 1979). As a comprehensive discussion of improvisation philosophies is beyond the scope of this article, the authors focus on several key principles relevant to the domain of public speaking.

Meggido (2019) proposed three basic principles for theatrical improvisation: listening, accepting, and committing. Meggido argued that listening was not solely aural, but included what people were doing and how they were doing it. A central tenet seen across all improvisational training is the concept of "Yes, And." It refers to the unconditional

acceptance of a person's statement/offer ("yes") and the expansion of it with your own ideas ("and"). Acceptance and expansion not only allow for the effective sustainment of an improvised scene, but also for the development of trust between participants and the creation of psychological safety. The unconditional acceptance of an improviser towards their partner and their ideas parallels the concept of unconditional positive regard (UPR) seen in person-centred psychotherapy (Rogers, 1957). Finally, committing refers to suspending judgement (of oneself and others), being bold, and engaging with the moment playfully. In addition to Meggido's principles, studies have found that training in theatrical improvisation can improve divergent thinking, flexibility, group collaboration, boost positive affect, self-efficacy, and increase uncertainty tolerance (see Felsman et al., 2020; Lewis & Lovatt, 2013; Mourey, 2020; Romanelli & Tishby, 2019; Sowden et al., 2015). The authors argue that these skills increase a person's perceived level of resourcefulness, which is used in the cognitive appraisal process when encountering threatening stimuli (e.g., public speaking situations).

Transferring to the domain of public speaking, several studies utilising theatrical improvisation as a tool for reducing anxiety and improving well-being are worth discussing in more detail. Felsman et al. (2019) explored the impact of a 10-week improvisational program to reduce social anxiety in adolescents. Although they had a high attrition rate (45.5%), the results indicated a significant decrease in anxiety scores over time, with a large effect size. Krueger et al. (2019) investigated the effect of a 4-week (4 x 2h) improvisation course to treat anxiety and depression. While the results demonstrated a significant decrease in anxiety and depression, along with a significant increase in self-esteem, there was no control group. Other studies (e.g., Casteleyn, 2019; Schwenke et al., 2020; Seppänen et al., 2019; Seppänen et al., 2020) have shown promise in their use of theatrical improvisation to specifically target public speaking anxiety. However, results were not significantly different when compared to the control groups.

The Improv Self-Efficacy and Skills Program (ISESP)

Effective public speaking not only requires the development of various performance skills (e.g., vocal, physical, storytelling, and adaptability), but also the reduction that influential threatening stimuli have on the individual. The Improv Self-Efficacy and Skills Program (ISESP) was developed by the first author, a public speaking expert specialising in acting and improvisational theatre techniques. The program aimed to increase public speaking self-efficacy, develop public speaking skills, and reduce PSA through a mixture of acting and improvisation exercises over six 2-hour workshops.

Self-efficacy refers to an individual's belief in their capacity to succeed in specific situations (Bandura, 1977). According to Bandura (1977), self-efficacy beliefs originate from four sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Mastery experiences (or previous performance outcomes) refer to the experiences an individual gains when they are successful in taking on a new challenge. Bandura (1977) stated that mastery experiences are the most influential source of self-efficacy due to the provision of authentic evidence of performance mastery. Vicarious experiences involve observing people similar to us successfully completing a task. Verbal persuasion relates to the positive verbal feedback and encouragement received while undertaking the task. The last source of self-efficacy featured in Bandura's self-efficacy theory, physiological and affective states, pertains to an individual's mood and perception of their arousal as either facilitative or debilitative to performance. The ISESP provides multiple opportunities and sources for the development of self-efficacy. For example, mastery experiences can occur through the completion of carefully guided exercises and public speaking performances in a safe environment. The ISESP offers opportunities to gain self-efficacy through vicarious experiences from successful partner observations. Finally, verbal persuasion (a core principle of the ISESP) is achieved through the coach's role and peer support.

Theoretical Basis for ISESP Intervention

For effective PSA reduction, threat saliency must also be diminished. Typically, this occurs via exposure- and/or cognitive-based therapies (e.g., Reeves et al., 2021; Wallach et al., 2009). For example, exposure-based therapies repeatedly expose an individual to threatening stimuli in a safe environment, thereby decreasing the emotional response until the neural structure is updated with more accurate information (e.g., this situation is not dangerous). Cognitive therapies aim to challenge and alter an individual's maladaptive thought patterns regarding the situation. Effective exposure experiences can be created where habituation occurs at each level before participants advance to the next stage. According to previous research (Benito & Walther, 2015; Grissom & Bhatnagar, 2009), fear activation, repetition, verbal persuasion, and scaffolding seem to be effective techniques for creating habituation opportunities. In line with best practices (see Witt & Behnke, 2006), interventions should begin with low-anxiety-inducing exercises before building to high-anxiety exercises towards the end of the program.

Therefore, in conjunction with the development of public speaking self-efficacy, the ISESP aims to provide participants with multiple exposure opportunities to a range of threatening stimuli in a graded format. Furthermore, as the term 'exposure' could increase perceived levels of threat, the authors will use the phrase 'opportunity training' with participants instead. This simple reframing creates a positive spin on the exposure element.

Rationale

While numerous interventions are available for the treatment of PSA (e.g., visualisation and cognitive behavioural therapy), limitations exist. For example, Chapter 2 highlighted the lack of self-efficacy assessment, meaningful exposure environments, and real-world public speaking situations. In addition, because many treatments require one-to-one coaching and/or specialised equipment, the scalability of such programs is limited. While the use of actor and improvisation theatre training shows promise, more rigorous research is

required. Therefore, the purpose of this study was to examine the effectiveness of alternative methodologies for the treatment of public speaking anxiety. The development and testing of the Improv Self-Efficacy and Skills Program (ISESP) will be the first of its kind in the UK and will aim to provide evidence to support the use of actor and improvisation theatre training to reduce public speaking anxiety (PSA) and increase public speaking self-efficacy.

Research Aims

This study aimed to assess the effectiveness of delivering a 12-hour Improv Self-Efficacy and Skills Program (ISESP) developed by the first author to reduce university students' public speaking anxiety and increase their public speaking self-efficacy. The following research hypotheses were formulated. First, the ISESP group will show a greater reduction in PSA over time in comparison to the control group. Second, in comparison to the control group, participants in the ISESP group will show a significant increase in public speaking self-efficacy across time. Third, the ISESP group will show a significant increase in impromptu speech duration compared to the control group. Finally, we propose that these effects will remain significant 6-months post-intervention.

Method

Participants

Following institutional ethical approval, participants were recruited from a university in the UK. Participation in the study was voluntary. Participants had to be over 18 years old and found public speaking to be anxiety- and/or fear-provoking. The final sample consisted of nine undergraduate students, 12 postgraduates, and one post-doctoral student (M_{age} = 26.55 years, *SD* = 7.50 years; *n* = 12 Female, *n* = 10 Male). See Table 4.1 for a full breakdown of participant demographics.

Table 4.1

Participant Demographics

Characteristic	ISESP (*n* = 11)	Wait-list Control (*n* = 11)	Full Sample (*n* = 22)
Age			
Mean (*SD*)	24.09 (3.2)	29 (9.7)	26.55 (7.5)
Gender, n (%)			
Male	4 (36.4)	6 (54.5)	10 (45.5)
Female	7 (63.6)	5 (45.5)	12 (54.5)
Ethnicity, n (%)			
White	8 (72.7)	5 (45.5)	13 (59.1)
Asian	1 (9.1)	4 (36.4)	5 (22.7)
Black	1 (9.1)	1 (9.1)	2 (9.1)
Other	1 (9.1)	1 (9.1)	2 (9.1)
Course, n (%)			
Undergraduate	6 (54.5)	3 (27.3)	9 (40.9)
Postgraduate	5 (45.5)	7 (63.6)	12 (54.5)
Postdoc	0 (0)	1 (9.1)	1 (4.5)
Number of verbal presentations delivered			
Mean (*SD*)	9.64 (7.1)	9.82 (5.7)	9.73 (6.3)
Range	3-20	1-20	1-20

Outcome Measures

Public Speaking Threats

The Public Speaking Threats Questionnaire (PSTQ) is a self-report measure of public speaking threats (see Chapter 3 and Appendix B). The identification of specific threatening stimuli allows for the tailoring of interventions (improving intervention efficacy). A total of 27 items are rated on a 5-point Likert scale ranging from 1 *(rarely)* to 5 *(always)* across three dimensions (physiological arousal, self-perceptions, and external judgements). However, one item "performing poorly worries me" was omitted from this study as the authors used an early iteration of the questionnaire. Dimension statements included "I worry that my face will go red" (physiological arousal), "I'm worried that I will forget my words (brain freeze)"

(self-perceptions), and "I am worried about the audience seeing me making a mistake" (external judgements). Internal consistency was good to excellent in the current sample for nearly all dimensions at pre-test (physiological arousal, α = .89; self-perceptions, α = .81; external judgements, α = .95), post-test (physiological arousal, α = .84; external judgements, α = .85), and follow-up (physiological arousal, α = .78; self-perceptions, α = .81; external judgements α = .88). However, at post-test, the self-perceptions dimension revealed poor internal consistency (α = .54).

Public Speaking Anxiety

The Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970) is a self-report measure of public speaking anxiety. The single-factor measure comprises of 34 items rated on a 5-point Likert scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree).* The total score was used to determine levels of PSA. Statements included: "While preparing for giving a speech, I feel tense and nervous." This measure was chosen because it is the preferred measure for assessing PSA (McCroskey, 1970) and is highly reliable (alpha estimated >.90). Internal consistency (Cronbach's α) of this measure in the current sample was .95 at pre-test, .87 at post-test, and .60 at 6-month follow-up.

Public Speaking Self-Efficacy

The Self-Efficacy Questionnaire (SEQ; Adams, 2004;) is a four-factor, 19-item, self-report measure of presentation self-efficacy. It assesses self-efficacy across four domains: speech, display, content, and presence. Two items, "speak with the appropriate level of formality" and "speak with adequate grammatical correctness" were removed from the speech domain as they were not relevant to this study. Further, several items were updated to reflect advancements in modern technology (i.e., 'overhead projector' changed to 'slides'). The modified measure consisted of 17 items rated on a 7-point Likert scale ranging from 1 *(not well at all)* to 7 *(extremely well).* The total score was used to determine levels of self-efficacy. Statements included "look at your audience at appropriate times when you are

speaking" and "speak at the right speed to your audience." Participants were asked to imagine that they had an important upcoming verbal presentation to give, lasting 30 minutes, on a topic taken from a current module to an audience of peers and departmental academic staff. Participants then read each statement and indicated how well they believed they could perform each task. Internal consistency (Cronbach's α) of this measure in the current sample was .95 at pre-test, .89 at post-test, and .89 at follow-up.

State Anxiety

The Mental Readiness Form 3 (MRF-3; Krane, 1994) was used to measure cognitive and somatic anxiety, and self-confidence. Three single items are rated on an 11-point Bipolar Likert scale with the following anchor terms: worried–not worried (cognitive anxiety), tense–not tense (somatic anxiety), and confident–not confident (self-confidence). The MRF-3 was chosen due to its brevity and concurrent validity with the competitive state anxiety inventory (CSAI-2; Martens et al., 1990).

Personal Comfort

The Visual Analogue Scale (VAS) is a self-report measure of comfort level. In this study, we used the modified VAS developed by Gallego et al. (2022). It consisted of one item "How uncomfortable did you feel giving the speech?" Participants rated how they felt by placing an X on a 10 cm wide printed line, ranging from 0 *(not uncomfortable at all)* to 10 *(extremely uncomfortable)*. Boonstra et al. (2014) suggest VAS scores ≥ 5.8 indicate severe symptoms, between 5.7 and 3.9 moderate, and ≤ 3.8 mild.

Impromptu Speech Task

The impromptu speech task used in this study was based on the Behavioural Avoidance Test (BAT; Beidel et al., 1989). Speech topics were changed at each stage to prevent participants from preparing before the assessment. Speech topics included "a passion you have in life" (pre-test), "yourself, your strengths, and your weaknesses" (post-test), and "what you would like to do when you leave university" (follow-up). The impromptu speech

task was selected for several reasons. First, it provided a realistic public speaking scenario for participants to experience. Second, the duration of the impromptu speeches (in seconds) could be used as a behavioural measure of distress tolerance. A maximum score of 300 seconds indicated that the participant spoke for the entire time. According to Levin et al. (2016), ending the task prematurely can be interpreted as an attempt to escape the anxiety that arises when delivering a speech.

Presentation Diary

To determine the effect of potentially confounding variables, all participants recorded the number of verbal presentations given over the 3-week treatment period. Presentation diaries were completed in an Excel spreadsheet each week and returned to the researcher at the end of the study for use in the analyses (see Appendix C for an example of a presentation diary).

Procedure

After obtaining informed written consent, participants completed the PSTQ, PRPSA, and SEQ using the Qualtrics online survey software. The first 20 participants were allocated to the experimental group and the subsequent 16 to the wait-list control group. The researcher contacted the participants with an appointment time. 11 participants dropped out before the pre-testing speeches could be delivered, and three dropped out after pre-testing. In addition, owing to scheduling conflicts, three participants were unable to attend the 12-hour program and were moved to the wait-list control group. This resulted in 11 experimental participants and 11 wait-list control participants in the final sample.

Upon arrival at the study site, participants were allocated three minutes to prepare a 5-minute impromptu speech on the topic “a passion you have in life.” Participants were allowed to write notes down to aid in their preparation but were subsequently not allowed to refer to them when speaking. Immediately before commencing their speech, participants completed the MRF-3. Participants were encouraged to speak for the whole five minutes but they could

stop at any time. The first author was the only person present in the room and maintained a neutral expression throughout the task. Upon task completion, participants completed the VAS and speech duration was recorded.

Participants in the experimental group received a 12-hour version of the Improv Self-Efficacy and Skills Program (ISESP) over three weeks and completed a presentation diary. Wait-list control group participants completed only the presentation diary. At the post-test (three weeks later), all participants completed all self-report measures and delivered a second impromptu speech on the topic "yourself, your strengths, and your weaknesses." Six months following the initial study all participants completed all outcome measures again and a third impromptu speech on the topic "what you would like to do when you leave university." Afterwards, the wait-list control group participants were offered a half-day intensive ISESP program lasting approximately three hours. Finally, all participants were debriefed, and the purpose of the study was fully explained to them.

Intervention Attendance and Study Attrition

Due to scheduling conflicts and personal reasons, attendance for the 3-week ISESP was not 100%. 82% of participants attended four or more sessions, while the remaining 18% managed to attend 3-4 sessions. Three participants dropped out of the study after pre-testing, two wait-list control and one experimental. This resulted in an attrition rate of 12%. Five participants dropped out at follow-up, resulting in a 23% attrition rate from post-test to follow-up.

Treatments

The Improv Self-Efficacy and Skills Program (ISESP)

Participants in the experimental group received six, 2-hour workshops, conducted bi-weekly over three weeks in a classroom within the university. The first session began with an outline of the program before introducing participants to the importance of creating and maintaining a psychologically safe environment for the duration of the intervention. This

concept was reaffirmed throughout the sessions. Each 2-hour workshop began with a warm-up before working through a series of solo, pair, group acting, and improvisation exercises focused on the learning objectives of the session. Exercises were taken from a variety of sources and were chosen to reflect the skills that needed to be developed in each session. The authors note that if participants are not from a performing background, character-based exercises that appear like acting (as seen in traditional improvisation-based therapies) could be difficult for non-performers to engage with. Therefore, the first author utilised more skill-based exercises, resulting in an expansion (rather than replacement) of the self (e.g., not performing as a character). Finally, as those with low public speaking self-efficacy were more likely to shy away from public speaking experiences, the first author ensured that each session was fun, energising, and motivational to ensure commitment.

To provide an optimal training environment, the first author aimed to ensure that individuals remained in their zone of proximal development (ZPD; Vygotsky, 1978). For example, while participation in every exercise was encouraged, if any exercise was too overwhelming or too difficult for an individual, the difficulty was either reduced, or the person stopped. After each exercise, a group discussion was conducted to share and reflect on the experienced feelings and insights. A summary and session reflection occurred during the last 10 minutes of each session. Participants in the wait-list control group were offered a half-day condensed version of the ISESP after the 6-month follow-up. See Table 4.2 for a brief outline of the ISESP 12-hour program, including session focuses and learning objectives. Appendix D provides a breakdown of the exercises used during one of the sessions.

Table 4.2

ISESP 12-hour Program Outlines

Session Focuses	Learning Objectives
Session 1. Breaking down barriers, building resourcefulness, developing communication skills	1. To provide an overview of the 3-week program. 2. To introduce each other, break down barriers, and develop group bonds. 3. Learners to develop their resourcefulness and communication skills.
Session 2. Vocal and physical skills, storytelling basics	1. Learners to understand the importance of warming up vocally and physically before a presentation. Readying for performance, similar to an athlete. 2. Learners to develop their vocal and physical skills. 3. Learners to understand the basics of storytelling.
Session 3. Advanced storytelling	1. Learners to understand advanced storytelling techniques. 2. Learners to develop their storytelling skills. 3. Learners to experience storytelling under pressure to the group.
Session 4. Presenting basics	1. Learners to develop their presenting skills. 2. Learners to develop their ability to combine creativity with presenting.
Session 5. Presenting under pressure	1. Learners to develop their ability to present under pressure. 2. Learners to develop their confidence when speaking in front of others.
Session 6. Advanced presenting under pressure	1. Learners to develop their ability to incorporate all aspects of the 3-week course into high-pressured situations. 2. Learners to reflect on the 3-week program.

Results

Statistical Analyses

Statistical analyses were performed using SPSS statistics (Version 29). To test the main hypotheses that participation in the ISESP would lead to decreased anxiety, increased self-efficacy, and increased speech duration, a two-way repeated measures multivariate analysis of variance (MANOVA) was conducted to compare the experimental (ISESP) and wait-list control group participants for all outcome variables over three time points (pre-, post-, and 6-month follow-up). Within and between-group effect sizes were calculated using Hedges' *g*. Following the recommendation of Hedges and Olkin (1985), Hedge's *g* was

chosen over Cohen's *d* to account for small sample bias in population effect sizes. Cohen (1988) suggests that effect sizes can be interpreted as small (g = .2), medium (g = .5) and large (g = .8).

Correlations

Pearson's correlation coefficient was used to investigate the association between treatment attendance and outcome measures at post-test. A secondary Pearson correlation coefficient was computed to assess the relationship between the number of verbal presentations delivered (between pre-and post-test) and outcome scores. Coefficient values between .51 and 1.0 indicate a high correlation; between .31 and .50, a moderate correlation; and between .10 and .30, a low correlation (Cohen, 1992). The results of the correlational analysis are presented in Table 4.3 and Table 4.4. No significant correlations were observed between treatment attendance and the outcome measures for the ISESP group at post-test. No significant correlations were observed between the number of verbal presentations delivered between pre- and post-test and outcome measures for either the ISESP or wait-list control groups.

Examining other variable associations, for the ISESP condition, high positive correlations were detected between the PSTQ-EJ and PSTQ-PA (r = .61, p < .05) and PSTQ-SP (r = .68, p < .05). High positive correlations were observed between MRF3-Cog and MRF3-Som (r = .65, p < .05), MRF3-Conf (r = .75, p < .01), and VAS (r = .80, p < .05). Finally, the MRF3-Conf subscale was highly correlated with MRF3-Som (r = .83, p < .05) and VAS scores (r = .78, p < .01). The authors note that, as high MRF3-Conf scores indicate low levels of self-confidence (that is, we did not reverse score this item), these positive correlations were expected. For the wait-list control group, all subscales of the PSTQ were correlated highly (r = .78 – .81, p < .01). High positive correlations were detected between PRPSA scores and the PSTQ-PA (r = .82, p < .01), PSTQ-SP (r = .72, p < .05), and PSTQ-EJ

(*r* = .79, *p* < .01) subscales. Finally, a high positive correlation was detected between MRF3-Som and MRF3-Cog (*r* = .64, *p* < .05) and VAS scores (*r* = .90, *p* < .01).

Table 4.3

Intercorrelations Between Treatment Attendance, Presentations Delivered, and All Post-Test Outcome Measures for ISESP Group

Measure	*M*	*SD*	Correlations (Pearson's *r*)											
			Attendance	Presentations Delivered	PSTQ-PA	PSTQ-SP	PSTQ-EJ	PRPSA	SEQ	MRF3-COG	MRF3-SOM	MFR3-CONF	VAS	Speech Duration
ISESP (*n* = 11)														
Attendance	4.82	1.17	-											
Presentations Delivered	1.55	1.64	-.31	-										
PSTQ-PA	2.39	.60	.16	.04	-									
PSTQ-SP	3.01	.24	-.14	-.02	.44	-								
PSTQ-EJ	3.17	.45	-.40	.16	.61*	.68*	-							
PRPSA	3.23	.35	-.29	-.51	.07	-.22	.15	-						
SEQ	4.39	.72	.37	.17	.32	.17	-.15	-.26	-					
MRF3-COG	6.00	2.19	0	-.06	-.09	.24	.11	-.03	.07	-				
MRF3-SOM	5.73	1.62	.50	-.32	.21	.12	-.17	.09	.56	.65*	-			
MFR3-CONF	5.82	1.89	.35	-.52	-.13	.01	-.15	.32	.23	.75**	.83*	-		
VAS	4.49	2.81	.12	-.36	-.35	.07	-.21	.13	-.10	.80**	.56	.78**	-	
Speech Duration	239.16	71.77	.23	.18	-.09	-.03	-.08	-.55	.21	-.35	-.30	-.34	-.59	-

Note. $p < .05$*, $p < .01$**

Table 4.4

Intercorrelations Between Presentations Delivered, and All Post-Test Outcome Measures for Wait-List Control Group

Measure	*M*	*SD*	Correlations (Pearson's *r*)										
			Presentations Delivered	PSTQ-PA	PSTQ-SP	PSTQ-EJ	PRPSA	SEQ	MRF3-COG	MRF3-SOM	MFR3-CONF	VAS	Speech Duration
Wait-List Control (*n* = 11)													
Presentations Delivered	2.18	2.44	-										
PSTQ-PA	2.43	.88	-.10	-									
PSTQ-SP	2.86	.72	.25	.81**	-								
PSTQ-EJ	2.94	.77	-.13	.78**	.78**	-							
PRPSA	3.27	.47	-.15	.82**	.72*	.79**	-						
SEQ	4.78	.72	.03	-.06	.08	-.16	-.08	-					
MRF3-COG	4.45	2.38	-.48	.27	.26	.40	.53	-.34	-				
MRF3-SOM	5.18	2.32	-.01	-.01	.13	0	.19	-.43	.64*	-			
MFR3-CONF	5.91	2.51	-.26	.22	.24	.59	.34	-.46	.31	.30	-		
VAS	4.63	2.56	.15	.04	.25	.03	.30	-.34	.56	.90**	.23	-	
Speech Duration	222.53	77.95	-.08	-.31	-.17	-.34	-.37	.49	-.34	-.26	-.41	-.25	-

Note. $p < .05$*, $p < .01$**

Main Outcome Analyses

A two-way repeated-measures MANOVA was performed with the within-subject factor time (pre vs. post vs. follow-up) and the between-subject factor group (ISESP vs. wait-list control). As no significant correlations were observed between the number of verbal presentations delivered or treatment attendance and any of our dependent variables, neither were used as covariates in our analyses. Results of the MANOVA yielded significant main effects for time (Wilks' $\Lambda = .20$, $F(20, 42) = 2.62$, $p < .01$, $\eta^2 = .56$, observed power = .98), and a non-significant main effect for group (Wilks' $\Lambda = .54$, $F(10, 6) = .92$, $p > .05$, $\eta^2 = .46$, observed power = .12). Importantly, a significant interaction between time and group (Wilks' $\Lambda = .27$, $F(20, 42) = 1.92$, $p < .05$, $\eta^2 = .48$, observed power = .92) was found for the combined dependent variables. To determine where significant interactions were, follow-up 2 x 3 mixed model ANOVA's with group (ISESP, wait-list control) as the between-participants factor and time (pre, post, and follow-up) as the within-participants factor were conducted on each of the 10 dependent variables (see main outcome analyses). Table 4.5 summarises means, standard deviations and effect sizes (Hedge's *g*).

Table 4.5

Means, Standard Deviations and Effect Sizes for Outcome Measures for ISESP and Wait-List Control

Measure	Group	Pre (n = 22)	Post (n = 22)	Follow-up (n = 17)	Effect Size (Hedge's g)					
					Pre vs. Post		Pre vs. Follow-up		Post vs. Follow-up	
		M (SD)	*M (SD)*	*M (SD)*	Within Group	Between Group	Within Group	Between Group	Within Group	Between Group
PSTQ-PA	ISESP	3.26 (1.02)	2.44 (.56)	2.43 (.71)	.91	1.04	.84	.62	-.15	-.55
	WLC	2.36 (.76)	2.37 (.91)	2.27 (.53)	-.13		.22		.40	
PSTQ-SP	ISESP	3.75 (.84)	2.99 (.27)	2.81 (.23)	.74	.47	1.00	.54	.23	.12
	WLC	3.08 (.76)	2.88 (.72)	2.81 (.76)	.27		.46		.11	
PSTQ-EJ	ISESP	3.79 (.97)	3.21 (.40)	3.12 (.80)	.59	.59	.82	.46	.04	-.06
	WLC	2.94 (.91)	2.91 (.79)	3.07 (.34)	0		.36		.10	
PRPSA	ISESP	133.55 (19.48)	109.91 (12.06)	106.80 (15.26)	1.42	.52	1.21	.50	.23	.50
	WLC	120.00 (18.11)	111.18 (15.99)	116.29 (14.58)	.90		.71		-.27	
SEQ	ISESP	61.00 (20.64)	74.64 (12.18)	74.60 (11.13)	.84	.41	.72	.49	.19	.02
	WLC	76.64 (14.71)	81.27 (12.28)	75.57 (16.79)	.43		.23		.17	
MRF3-COG	ISESP	7.18 (2.18)	6.00 (2.19)	4.40 (1.71)	.47	-.10	1.12	.67	.59	.85
	WLC	5.55 (2.46)	4.45 (2.38)	5.00 (1.83)	.57		.45		-.26	
MRF3-SOM	ISESP	7.00 (2.32)	5.73 (1.62)	4.00 (1.83)	.43	.16	.84	-.16	.69	.27
	WLC	6.00 (3.00)	5.18 (2.32)	4.43 (1.40)	.27		1.00		.42	
MRF3-CONF	ISESP	7.00 (2.53)	5.82 (1.89)	5.30 (1.42)	.38	.35	.45	.48	.24	.24
	WLC	5.95 (2.37)	5.91 (2.51)	5.71 (1.60)	.03		-.03		0	
VAS	ISESP	6.66 (1.88)	4.49 (2.81)	3.07 (1.90)	.75	.48	1.24	.83	.45	.27
	WLC	5.40 (2.50)	4.63 (2.56)	4.63 (3.13)	.27		.41		.18	
Speech Duration (seconds)	ISESP	160.91 (73.74)	239.16 (71.77)	278.22 (49.35)	2.16	1.62	2.25	2.00	.46	.21
	WLC	192.27 (74.29)	222.53 (77.95)	222.80 (80.75)	.54		.25		.25	

ISESP = Improv Self-Efficacy and Skills Program Group; WLC = Wait-List Control Group; PSTQ = Public Speaking Threats Questionnaire; PA = Physiological Arousal; SP = Self-Perceptions; EJ = External Judgements; PRPSA = Personal Report of Public Speaking Anxiety; SEQ = Self-Efficacy Questionnaire; MRF = Mental Readiness Form 3; COG = Cognitive; SOM = Somatic; CONF = Self-Confidence; VAS = Visual Analogue Scale.

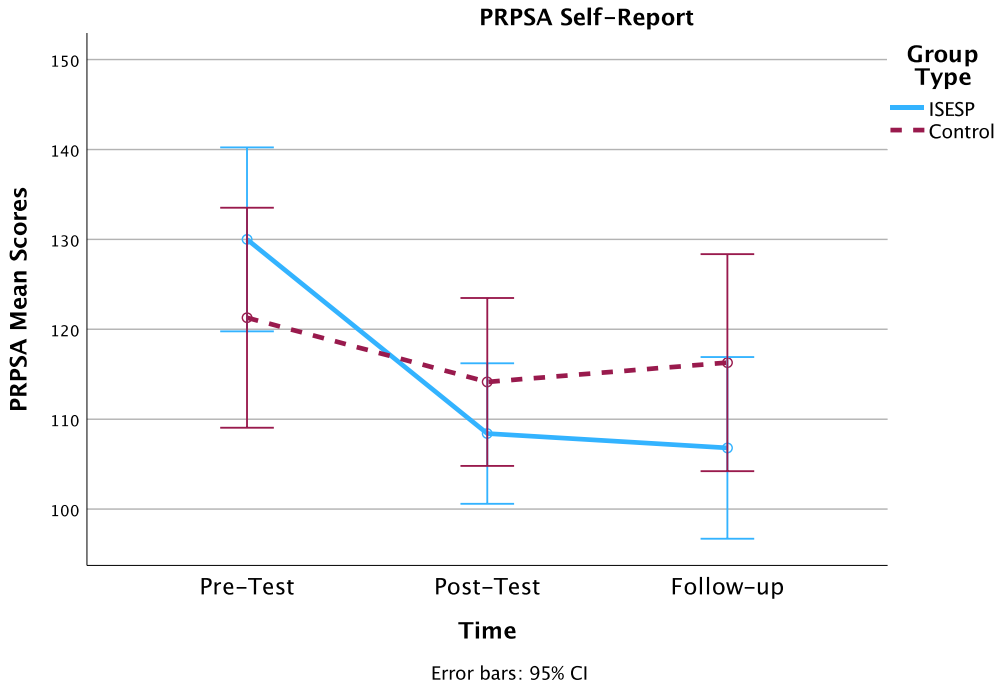
Follow-up Analyses

Personal Report of Public Speaking Anxiety (PRPSA)

A 2 x 3 mixed model ANOVA revealed a significant main effect for time, $F(2,30) = 16.57$, $p < .001$, partial $\eta^2 = .53$, and a significant interaction between time and group, $F(2,30) = 5.66$, $p < .01$, partial $\eta^2 = .27$. No significant between group effects were observed (see Fig 4.1). There was a significant effect of time on PRPSA scores for the ISESP group, $F(2,18) = 17.76$, $p < .001$, partial $\eta^2 = .66$. No significant effects were observed for the wait-list control group. Paired samples t-tests revealed that for the ISESP group, PRPSA scores significantly decreased at post-test compared to pre-test ($M_{diff} = 23.64$, $SD = 15.36$), $t(10) = -5.10$, $p < .001$, $g = 1.42$, and at follow-up compared to pre-test ($M_{diff} = 23.20$, $SD = 17.55$), $t(9) = -4.18$, $p < .01$, $g = 1.21$. No significant differences occurred between post-test and follow-up. Results from independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.1

Changes in PRPSA Scores Over Time for ISESP and Wait-list Control Groups

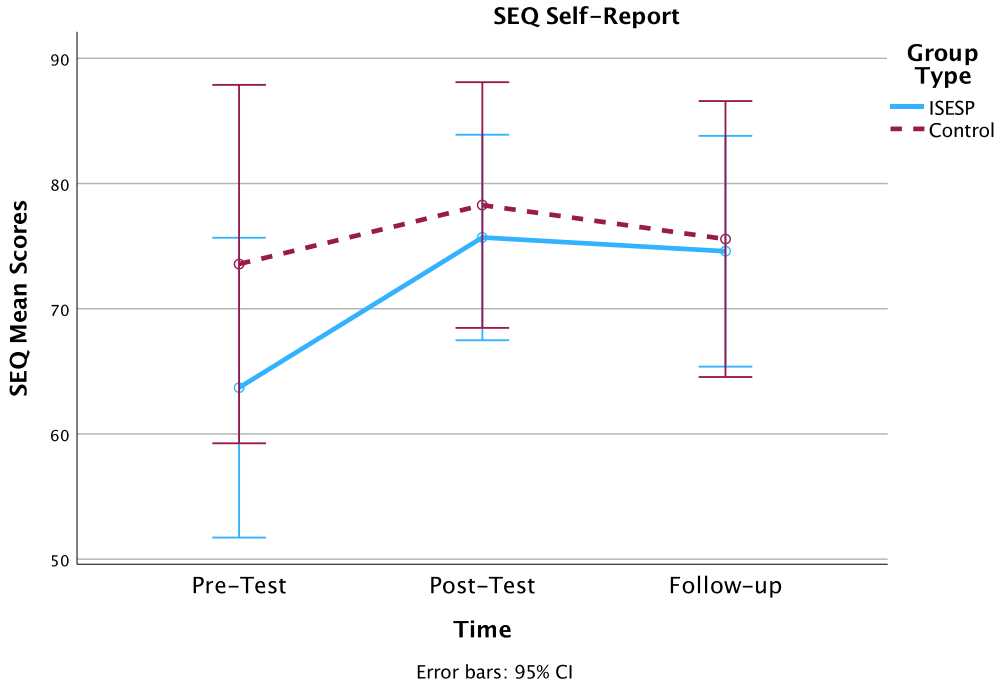


Self-Efficacy Questionnaire (SEQ)

A 2 x 3 mixed model ANOVA revealed a significant main effects for time, $F(2,30) = 4.74$, $p < .05$, partial $\eta^2 = .24$). No other main effects or interactions were significant (see Fig. 4.2). There was a significant effect of time on SEQ scores for the ISESP group, $F(2,18) = 6.05$, $p < .05$, partial $\eta^2 = .40$. No significant effects were observed for the wait-list control group. Paired samples t-tests indicated that for the ISESP group, SEQ scores significantly increased at post-test compared to pre-test ($M_{diff} = 13.64$, $SD = 14.96$), $t(10) = 3.02$, $p < .001$, $g = .90$, and at follow-up compared to pre-test ($M_{diff} = 10.90$, $SD = 13.85$), $t(9) = 2.49$, $p < .05$, $g = .71$. No significant differences occurred between post-test and follow-up. Independent t-tests at post-test and follow-up showed no significant differences between the groups.

Figure 4.2

Changes in SEQ Scores Over Time for ISESP and Wait-list Control Groups



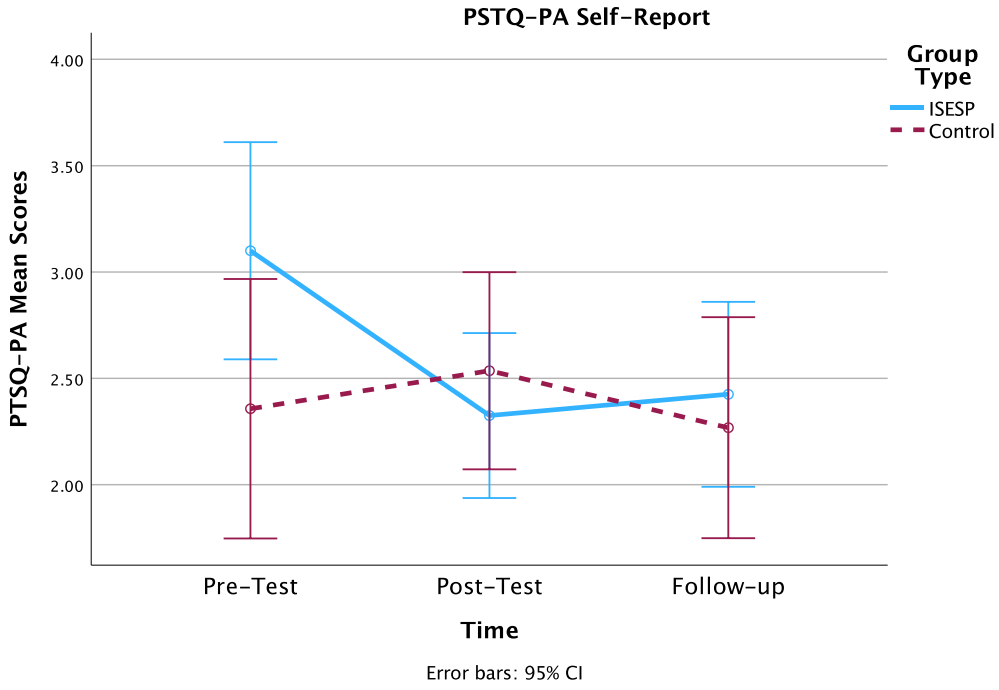
Public Speaking Threats Questionnaire (PSTQ-PA)

A 2 x 3 mixed model ANOVA revealed a significant interaction for time and group, $F(2,30) = 4.36$, $p < .05$, partial $\eta^2 = .23$. No other main effects were significant (see Fig. 4.3).

Paired samples t-tests indicated that for the ISESP group, PSTQ-PA scores significantly decreased at post-test compared to pre-test (M_{diff} = .88, *SD* = .88), *t*(10) = -3.28, *p* < .01, *g* = .99, and at follow-up compared to pre-test (M_{diff} = .68, *SD* = .74), *t*(9) = -4.18, *p* < .01, *g* = .91. No significant differences occurred between post-test and follow-up. Results from independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.3

Changes in PSTQ-PA Scores Over Time for ISESP and Wait-list Control Groups



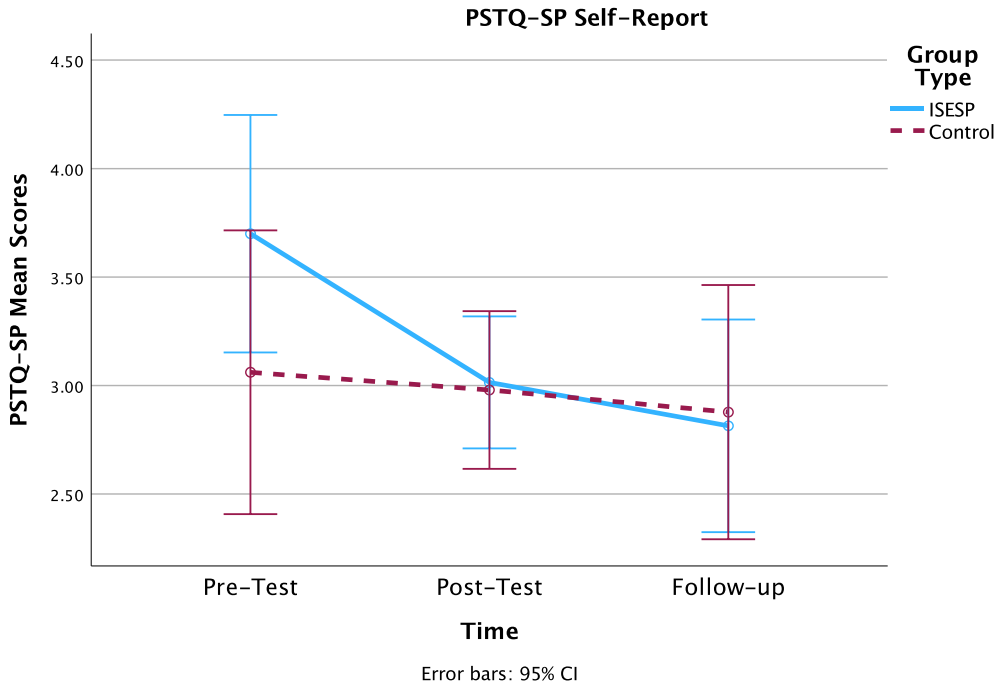
Public Speaking Threats Questionnaire (PSTQ-SP)

A 2 x 3 mixed model ANOVA of the PSTQ-SP scores revealed a significant main effects for time, *F*(2,30) = 3.80, *p* < .05, partial η^2 = .20. No significant effects were observed for any other effects or interactions (see Fig. 4.4). There was a significant effect of time on PSTQ-SP scores for the ISESP group, *F*(2,18) = 5.91, *p* < .05, partial η^2 = .40. No significant effects were observed for the wait-list control group. Paired samples t-tests indicated that for the ISESP group, PSTQ-SP scores significantly decreased at post-test compared to pre-test (M_{diff} = .74, *SD* = .92), *t*(10) = -2.67, *p* < .05, *g* = .81, and at follow-up compared to pre-test

(M_{diff} = .89, *SD* = .81), *t*(9) = -3.44, *p* < .01, *g* = 1.09. No significant differences occurred between post-test and follow-up. Results from independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.4

Changes in PSTQ-SP Scores Over Time for ISESP and Wait-list Control Groups



Public Speaking Threats Questionnaire (PSTQ-EJ)

Analyses of PSTQ-EJ scores revealed no significant effects or interactions.

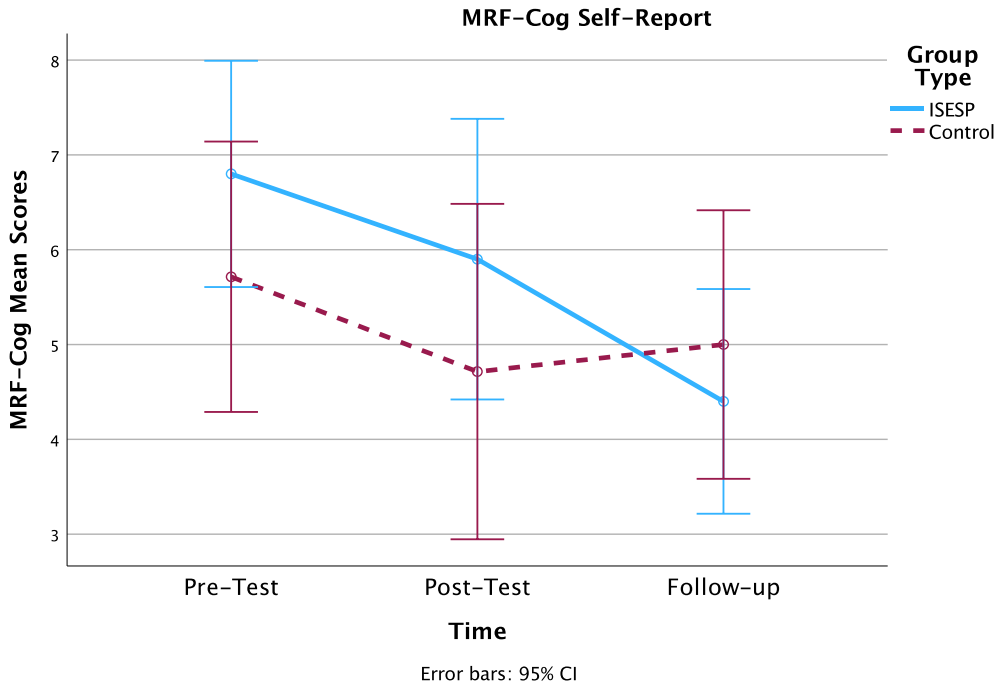
Mental Readiness Form 3 (MRF3-Cog)

A 2 x 3 mixed model ANOVA revealed a significant main effects for time, *F*(2,30) = 5.55, *p* < .01, partial η^2 = .27. No other main effects or interactions were significant (see Fig. 4.5). There was a significant effect of time on MRF-Cog scores for the ISESP group, *F*(2,18) = 6.21, *p* < .01, partial η^2 = .41. No significant effects were observed for the wait-list control group. Paired samples t-tests revealed that for the ISESP group, MRF3-Cog scores significantly reduced at follow-up compared to pre-test (M_{diff} = 2.40, *SD* = 1.96), *t*(9) = -4.18, *p* < .01, *g* = 1.12. No significant differences occurred between any other time points. Results

from independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.5

Changes in MRF3-Cog Scores Over Time for ISESP and Wait-list Control Groups



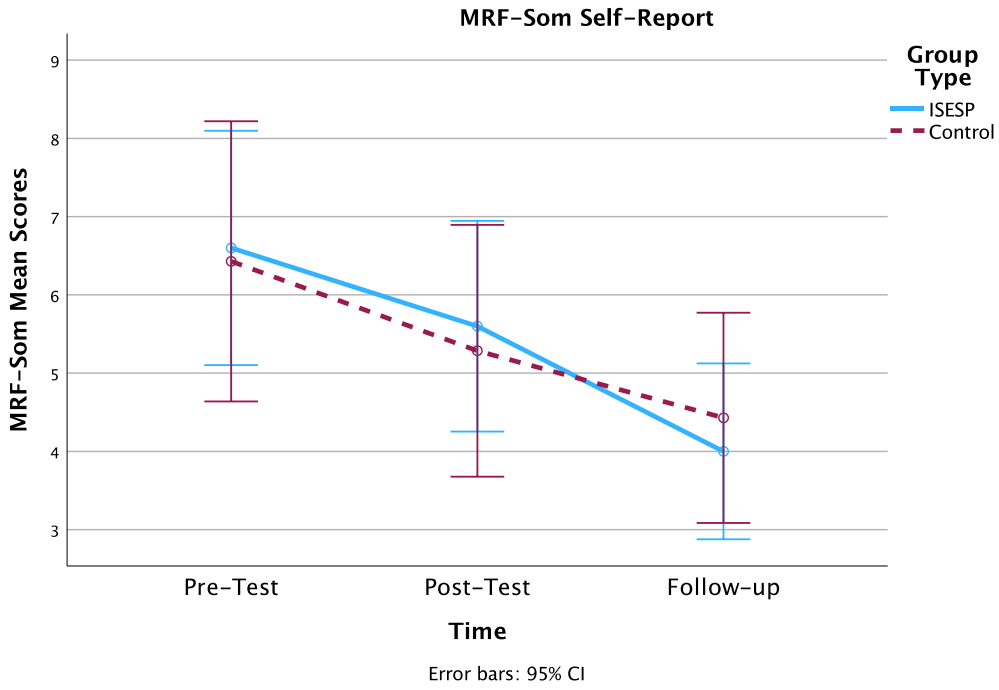
Mental Readiness Form 3 (MRF3-Som)

A 2 x 3 mixed model ANOVA of MRF3-Som scores revealed significant main effects for time, $F(2,30) = 8.82$, $p < .001$, $\eta^2 = .37$. No other main effects or interactions were significant (see Fig. 4.6). There was a significant effect of time on the MRF3-Som scores for the ISESP group, $F(2,18) = 5.14$, $p < .05$, partial $\eta^2 = .36$, and the wait-list control group, $F(2,18) = 6.08$, $p < .05$, partial $\eta^2 = .50$. Paired samples t-tests indicated that for the ISESP group, MRF3-Som scores were significantly reduced at follow-up compared to pre-test ($M_{diff} = 2.60$, $SD = 2.84$), $t(9) = -2.90$, $p < .05$, $g = .92$, and at follow-up compared to post-test ($M_{diff} = 1.60$, $SD = 2.12$), $t(9) = -2.39$, $p < .05$, $g = .76$. No significant differences were observed between the pre- and post-tests. Paired samples t-tests revealed that for the wait-control group, MRF3-Som scores were significantly reduced at follow-up compared to pre-test ($M_{diff} = 2.00$, $SD = 1.73$), $t(9) = -3.01$, $p < .05$, $g = 1.16$. No significant differences occurred

between any other time points. Results from independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.6

Changes in MRF3-Som Scores Over Time for ISESP and Wait-list Control Groups



Mental Readiness Form 3 (MRF3-Confidence)

Analyses of MRF3-Confidence scores revealed no significant main effects or interactions.

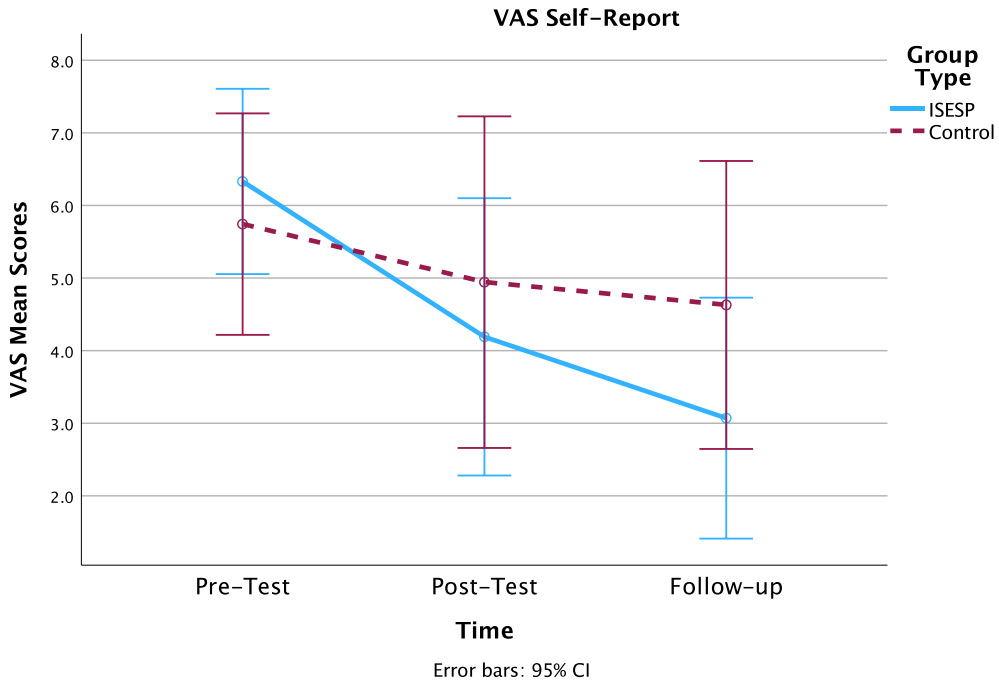
Visual Analogue Scale (VAS)

A 2 x 3 mixed model ANOVA revealed a significant main effects for time, $F(2,30) = 7.59$, $p < .01$, $\eta^2 = .34$). No other main effects or interactions were significant (see Fig. 4.7). There was a significant effect of time on the VAS scores for the ISESP group, $F(2,18) = 8.75$, $p < .01$, partial $\eta^2 = .49$. No significant effects were observed for the wait-list control group. Paired samples t-tests indicated that for the ISESP group, VAS scores significantly decreased at post-test compared to pre-test ($M_{diff} = 2.17$, $SD = 2.67$), $t(10) = -2.70$, $p < .05$, $g = .81$, and at follow-up compared to pre-test ($M_{diff} = 3.26$, $SD = 2.41$), $t(9) = -4.29$, $p < .01$, $g = 1.36$. No significant differences were observed between post-test and follow-up. Results from

independent t-tests at post-test and follow-up showed no significant differences between the ISESP and wait-list control groups.

Figure 4.7

Changes in VAS Scores Over Time for ISESP and Wait-list Control Groups

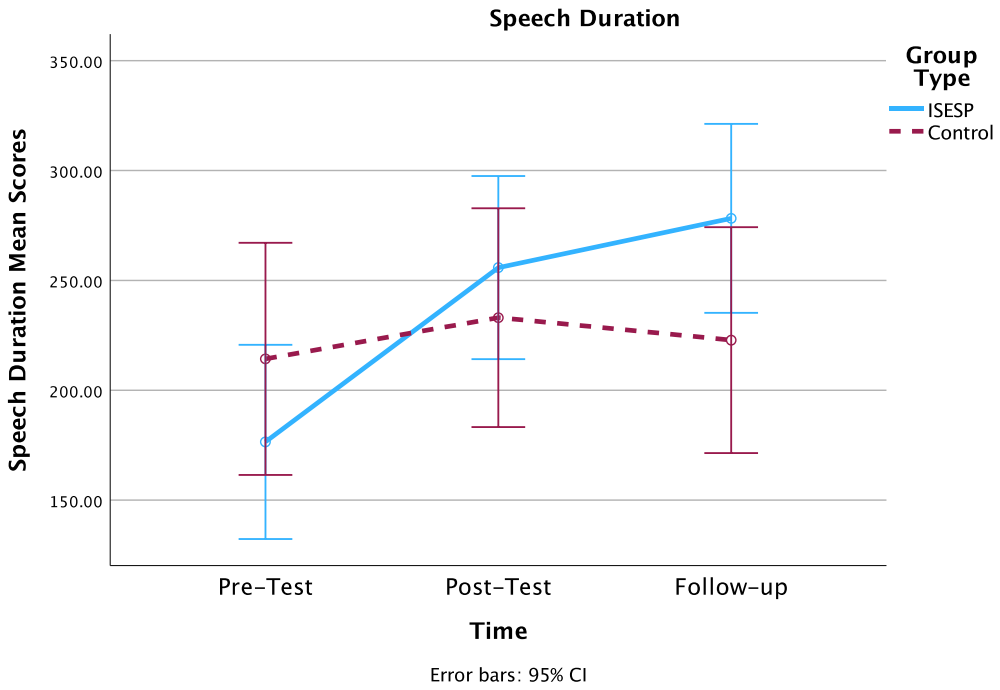


Speech Duration

A 2 x 3 mixed model ANOVA revealed a significant main effect for time, $F(2,30) = 17.42$, $p < .001$, $\eta^2 = .54$, and a significant interaction between time and group, $F(2,30) = 10.67$, $p < .001$, $\eta^2 = .42$. No significant between group effects were observed (see Fig 4.8). There was a significant effect of time on speech duration scores for the ISESP group, $F(2,18) = 34.70$, $p < .001$, partial $\eta^2 = .79$. No significant effects were observed for the wait-list control group. Paired samples t-tests revealed that for the ISESP group, speech duration significantly increased at post-test compared to pre-test ($M_{diff} = 78.25$, $SD = 33.50$), $t(10) = 7.75$, $p < .001$, $g = 2.16$, and at follow-up compared to pre-test ($M_{diff} = 101.72$, $SD = 41.27$), $t(9) = 7.79$, $p < .001$, $g = 2.47$. No significant differences were observed between the post-test and follow-up. Results from independent t-tests at post-test and follow-up showed no significant differences between the groups.

Figure 4.8

Changes in Speech Duration Scores Over Time for ISESP and Wait-list Control Groups



Discussion

The purpose of this study was to determine the efficacy of a 12-hour intervention program utilising acting and theatrical improvisation techniques to reduce PSA and increase public speaking self-efficacy. A small sample of 11 experimental and 11 wait-list control participants took part in this study. Results concluded that participation in the Improv Self-Efficacy and Skills Program (ISESP) led to significant reductions in public speaking anxiety (PRPSA), discomfort (VAS), physiological arousal threats (PSTQ-PA) and self-perceptions threats (PSTQ-SP) scores along with increases in self-efficacy (SEQ) scores and speech duration. Although the intervention group demonstrated greater improvements in all outcome measures compared to the wait-list control group at post-test, between-group statistical significance was not achieved. Results were maintained at 6-month follow-up.

Theoretical Implications

The present study is the first of its kind to demonstrate the use of theatrical improvisation to reduce PSA. This study also supports previous research, in which the use of improvisation reduced social anxiety (Felsman et al., 2019; Krueger et al., 2019). Chapter 2's systematic review and meta-analysis revealed that effective interventions utilised exposure-based strategies, cognitive-based strategies, or a combination of both. The ISESP incorporated a combination of exposure-based strategies and skills training to reduce PSA and increase public speaking self-efficacy. The exposure element of the ISESP reduces the influence of threatening stimuli by repeatedly providing opportunities for individuals to be exposed to threatening stimuli in a safe environment. With each successful exposure (i.e. habituation), the emotional response decreased until the neural structure was updated with more accurate information (e.g., this situation is safe). Skills training provided the necessary development of various performance skills (e.g., vocal, physical, storytelling, and adaptability).

Speech Duration

The impromptu speech task provided a behavioural avoidance measure. Any termination before 300 seconds was interpreted as an attempt to escape the arising anxiety. ISESP participants were able to speak (on average) longer than the wait-list control group at post-test and demonstrated the greatest overall improvement in pre- and post-test scores ($M_{\text{diff}} = 78.23$, $p < .001$). This improvement, along with 36% of the ISESP participants at post-test and 70% at follow-up speaking for the maximum time, highlights the efficacy of the intervention in increasing distress tolerance and reducing the saliency of public speaking threats. These findings also provide initial evidence of the ISESP's effect on delaying performance catastrophes (where performance drops precipitously) and could have been due to an increase in attentional control, an increase in self-efficacy, a reduction in threat saliency, or a combination of the three.

According to attentional control theory (ACT; Eysenck et al., 2007), attention is regulated by a goal-directed attentional system (top-down processing) and a stimulus-driven attentional system (bottom-up saliency). Anxiety disrupts the balance between these two systems, diverting cognitive resources from task-relevant to task-irrelevant cues. This reallocation of cognitive resources decreases performance in tasks involving the central executive (i.e., public speaking).

Public speaking is a cognitively demanding task that requires the speaker to engage in multiple tasks (e.g., recalling content and utilising vocal and physical skills), switch attention between sub-tasks (e.g., between content and audience responses), while inhibiting task-irrelevant cues (e.g., public speaking threats). Additionally, both task demands, and the saliency of task-irrelevant cues can fluctuate dramatically throughout a public speaking situation. For example, when a person undergoes a public speaking task, the goal-directed attentional system aims for the person to complete the task, and the stimulus-driven attentional system is sensitive to internal and external threats. If public speaking internal or external threats achieve sufficient saliency, attention will switch from task-relevant cues (e.g., completing the verbal presentation) to task-irrelevant cues (paying attention to sources of threat), thereby reducing attentional control. Although we did not directly assess this, as ISESP participants were able to sustain their performance for longer (i.e., 70% spoke for the full 300 seconds at follow-up), we hypothesise that their attentional control may have increased as a result of our intervention.

Applied Implications

Several applied implications have arisen from this study and are worth discussing.

The ISESP

The ISESP is a multi-modal therapy that combines skills training, psychological skills training (PST) and exposure therapy. PST typically utilises explicit knowledge; however, under pressure, de-automation can occur, leading to an inability to implement the learned

skills. In contrast, the ISESP utilised implicit knowledge to develop many psychological skills; therefore, under pressure (e.g., a public speaking situation), greater retention occurred, leading to sustained performance. This was observed with all ISESP participants improving their speech duration behavioural measure (with one individual increasing the duration by 1,400% between pre-and post-tests).

The main limitation of traditional exposure therapies is the time and effort required to accurately recreate situations that provoke a fear response (Horigome et al., 2020). The authors of this study posit that ISESP exercises allow for rapid, accurate, and frequent exposure-based opportunities, requiring minimal effort that can be quickly adapted to meet the needs of individuals. Mastery experiences were achieved through each successful exposure, allowing for the development of self-efficacy. In summary, the ISESP provides the benefits of traditional PSA interventions without the stigma and access difficulties commonly experienced. Additionally, once adequate training for facilitators has occurred, it has the potential to be widely administered in both educational and occupational settings.

PSA Assessment

This study implemented several assessment practices that should be used in future studies examining PSA. First, a public speaking component was used at each testing stage. Without an assessment of speaking performance, it is very difficult to determine real-world implications of research. As in this study, the audience size, environment, preparation time, and speech duration should be kept consistent at each testing stage. We opted to use an impromptu speech to prevent prior speech preparation and to provide a behavioural measure of PSA. Furthermore, to prevent topic familiarity among some participants biasing results, our speech topics focused on personal viewpoints (e.g., a passion you have in life, strengths and weaknesses, and what you want to do after university).

Second, alongside the behavioural measure, we used several self-report measures that should be used in future studies. To provide an overall level of PSA, we opted to use the

PRPSA (McCroskey, 1970). The PRPSA was chosen due to its high reliability and direct focus on public speaking (compared to the commonly used PRCA which examines communication apprehension in four domains: public speaking, interpersonal, meetings, and groups). We opted to use the PSTQ developed in Chapter 3 to determine specific threats related to public speaking. The PSTQ measure allows applied practitioners to compartmentalise the overwhelming generality of finding public speaking situations threatening into manageable, specific threats that can be targeted and overcome. Furthermore, it allows the grouping of participants to individualise interventions. Unfortunately, owing to our small sample size, we were unable to take full advantage of this. However, we were able to shape the group intervention to target common public speaking threats (e.g., forgetting content, making mistakes, being negatively judged). Although several other measures were used in our study, we recommend the use of the PRPSA, PSTQ, and impromptu speech task in future research exploring PSA.

Along with self-reporting and behavioural assessments of PSA, observer and psychophysiological measures are worth exploring in future research. Psychophysiological measures include heart rate monitoring and skin conductance (see Azevedo et al., 2017), and observer ratings include assessing individuals' public speaking performance and identifying speech disfluencies (see Pawlik & Perrin, 2020; Wallach et al., 2009). Psychophysiological assessments are particularly significant in assessing in-the-moment presentations which could be timed to match certain aspects of the presentation itself. For example, if the presenter cannot answer a challenging question, what kind of psychophysiological response may they show and why. However, the authors note that such measures may require substantial training and may not be applicable to some studies.

Limitations and Future Directions

Certain limitations of this study should be addressed in future research. For example, owing to recruitment issues, the sample size was relatively small compared to the overall

target population. Therefore, future studies should use larger and more heterogeneous sample(s) to provide further evidence to support the efficacy of the ISESP on PSA and public speaking self-efficacy.

Another limitation of our study was the treatment allocation. As participants were allocated to groups prior to pre-testing, ISESP participants may have had initially elevated levels of stress (due to volunteering to enter a public speaking environment in which they were not comfortable). Although non-significant, this could explain why the ISESP group means were higher at pre-testing than those in the wait-list control group. Future studies may benefit from pre-testing all participants before allocating them to intervention and control groups. Furthermore, the PRPSA (McCroskey, 1970) and PSTQ (see Chapter 2) can be used for participant intervention allocation.

The ISESP itself had some limitations. First, due to the time required to deliver the intervention (i.e., 12 hours), this might not be possible in many educational and occupational settings. Therefore, future studies should explore the efficacy of variations in treatment duration. Second, the delivery of the ISESP requires a trained coach experienced in improvisation and acting techniques. This may limit the scalability of such programs. Future research should explore the development of a train-the-trainer program to instruct applied practitioners and coaches on the effective assessment and delivery of the ISESP.

As study participation was voluntary, highly anxious and fearful individuals may not have wanted to participate out of fear of public speaking, resulting in missed opportunities for those in most need. The authors hypothesise that if an individual perceives no clear benefit to delivering a presentation (no BAS activation), they are less likely to engage in motivational behaviours and more likely to experience negative affect (e.g., FFFS activation). Therefore, future research should examine the role motivation has in mediating PSA and FoPS and what motivating factors (intrinsic and extrinsic) increase BAS activation in both occupational and

educational settings. Finally, the ISESP's impact on attentional control and working memory would be an area of interest for future studies.

Conclusion

This study aimed to determine the efficacy of the Improv Self-Efficacy and Skills Program (ISESP) on PSA and public speaking self-efficacy. The ISESP is a multi-modal therapy, combining exposure with psychological and skills training. Threat saliency is reduced through multiple successful exposures to feared stimuli, while public speaking self-efficacy is achieved through mastery experiences, vicarious experiences, and verbal persuasion. Results indicate that participation in the 12-hour ISESP leads to significant reductions in public speaking anxiety, discomfort, physiological arousal threats, and self-perceptions threats, along with increases in self-efficacy (SEQ) scores and speech duration.

Although the ISESP condition demonstrated greater improvements in all outcome measures compared to the wait-list control and achieved a significant main effect for time, between-group statistical significance was not achieved. However, results were maintained at 6-month follow-up. The present research, therefore, contributes to a growing body of evidence suggesting that actor and improvisation theatre training can be used as an efficacious and cost-effective methodology for the reduction of PSA and increase of public speaking self-efficacy.

Chapter 5: General Discussion

The final chapter summarises the results presented in the previous chapters before discussing the applied and theoretical implications. Strengths, limitations, and future directions of the thesis follow.

Thesis Objectives

The purpose of this thesis was to address some of the limitations embedded in the public speaking anxiety literature. The five main objectives were to (1) note the limitations in the construct of public speaking anxiety (PSA) in order to reduce ambiguity and provide conceptual clarity; (2) identify effective methodologies for the treatment of PSA; (3) identify current limitations and gaps in current research; (4) develop a valid and reliable measure for identifying public speaking threats; and (5) examine the effects of an acting- and improvisation-based intervention on the reduction of PSA and development of public speaking self-efficacy of university students.

Summary of Results

Chapter 1 discussed the impact that PSA and fear of public speaking (FoPS) can have at both the individual and organisational levels. It also critically reviewed the effects of both phenomena on performance and well-being. Due to the ambiguity observed throughout the PSA literature, we discussed the importance of conceptual clarity moving forward and decided to focus the thesis on PSA. Finally, a working definition of public speaking, public speaking threats, PSA, and FoPS was provided using Gray and McNaughton's (2000) revised Reinforced Sensitivity Theory (rRST) as a theoretical framework.

Chapter 2 systematically reviewed and meta-analysed theoretically driven interventions related to reducing PSA. This was the first of its kind to offer a detailed critical narrative synthesis of PSA interventions. 26 articles from 1st January 2000 to 1st June 2023 met the criteria for inclusion in the review. Research was of a moderate to high methodological standard and the review provided support for the efficacy of psychological

interventions to reduce PSA. Although the intervention types varied greatly, interventions involving cognitive modification and exposure therapy were the most common. Interventions either focused on reducing the symptoms of PSA or targeted its source. While some symptomatic treatments were highly effective in providing immediate short-term relief, the long-term implications remain unknown. This review highlighted several limitations in the design and execution of interventions aimed at reducing PSA levels. Limitations in long-term efficacy, real-world implications, self-efficacy development, and individual differences in treatment assignment were discussed.

Addressing the limitations observed across the PSA literature (i.e., "one-size-fits-all" interventions and poorly chosen self-report measures), Chapter 3 developed and validated a new measure to identify specific public speaking threats. Study 1 focused on item development and the initial validation of the Public Speaking Threats Questionnaire (PSTQ), while Study 2 conducted confirmatory and criterion validity with a second larger sample. Bayesian structural equation modelling (BSEM) and Pearson's *r* were used to validate the new measure. Study 3 examined test-retest reliability and predictive validity using a sample from a UK university. The PSTQ achieved an excellent model fit for the final 27-item, three-factor measure (physiological arousal, self-perceptions, and external judgements), with excellent criterion validity. Finally, Chapter 3 highlighted potential shortcomings of the current university experience in reducing public speaking threats.

Building on the limitations observed in the systematic review and meta-analysis, Chapter 4 examined the potential positive effects that actor and improvisation theatre training can have on reducing PSA and increasing public speaking self-efficacy. The Improv Self-Efficacy and Skills Program (ISESP) was a multi-modal therapy, combining exposure with psychological and skills training. Over the 12-hour program, participants were taught a variety of skills aimed at developing vocal, physical, storytelling, and presentation skills. Participants engaged in a series of solo, pair, and group exercises, led by a public speaking

expert who specialised in acting and improvisational theatre techniques. See Appendix D for a breakdown of exercises used during one of the sessions.

Threat saliency was reduced through multiple successful exposures to feared stimuli, whereas public speaking self-efficacy was achieved through mastery experiences, vicarious experiences, and verbal persuasion. The ISESP participants received a 12-hour program delivered over three weeks (6 x 2h). Results indicated that participation in the ISESP led to significant reductions in public speaking anxiety, discomfort, physiological arousal threats, and self-perception threats, along with increases in self-efficacy and speech duration. However, no between-group statistical significance was observed. Results were maintained at 6-month follow-up. Although the intervention sample size was small (n = 11), this study contributes to a growing body of evidence suggesting that actor and improvisation theatre training can be used as an efficacious and cost-effective methodology for reducing PSA and increasing public speaking self-efficacy.

Theoretical Implications

Conceptual Clarity

One initial objective of this thesis was to provide conceptual clarity for the terms public speaking anxiety (PSA) and fear of public speaking (FoPS). Chapter 2's systematic review and meta-analysis highlighted the propensity towards conceptual ambiguity. Drawing on Gray and McNaughton's (2000) revised Reinforced Sensitivity Theory (rRST), this thesis argues that PSA and FoPS are distinct entities and should be treated as such, both from a theoretical and testing perspective. We propose that PSA arises due to BIS activation, whereas FoPS occurs only when the FFFS is activated. BIS activation aims to resolve goal conflict by increasing the saliency of threatening stimuli (by recursive loops) until either the perception of danger has sufficiently increased (favouring FFFS and escape behaviour) or the perception of danger has diminished (favouring approach behaviours). For example, in a public speaking situation, a person may appraise one or more stimuli as a threat, activating

the FFFS and eliciting fear. However, if the same situation activates the BAS (due to an intrinsic and/or extrinsic motivation to move toward the threatening stimuli), BIS activation will occur, eliciting anxiety. BIS activation occurs as a time-to-event function, engaging in risk assessment and passive avoidance behaviours when the defensive distance is far. However, when the defensive distance is short, a person may feel overwhelmed by the situation, and the FFFS dominates. Furthermore, BIS activation can occur when there are two equally threatening stimuli that must be faced. Table 5.1 summarises the working definitions of public speaking, PSA, FoPS, and public speaking threats used in this thesis.

Table 5.1

Definitions of Public Speaking, Public Speaking Anxiety, Fear of Public Speaking, and Public Speaking Threats

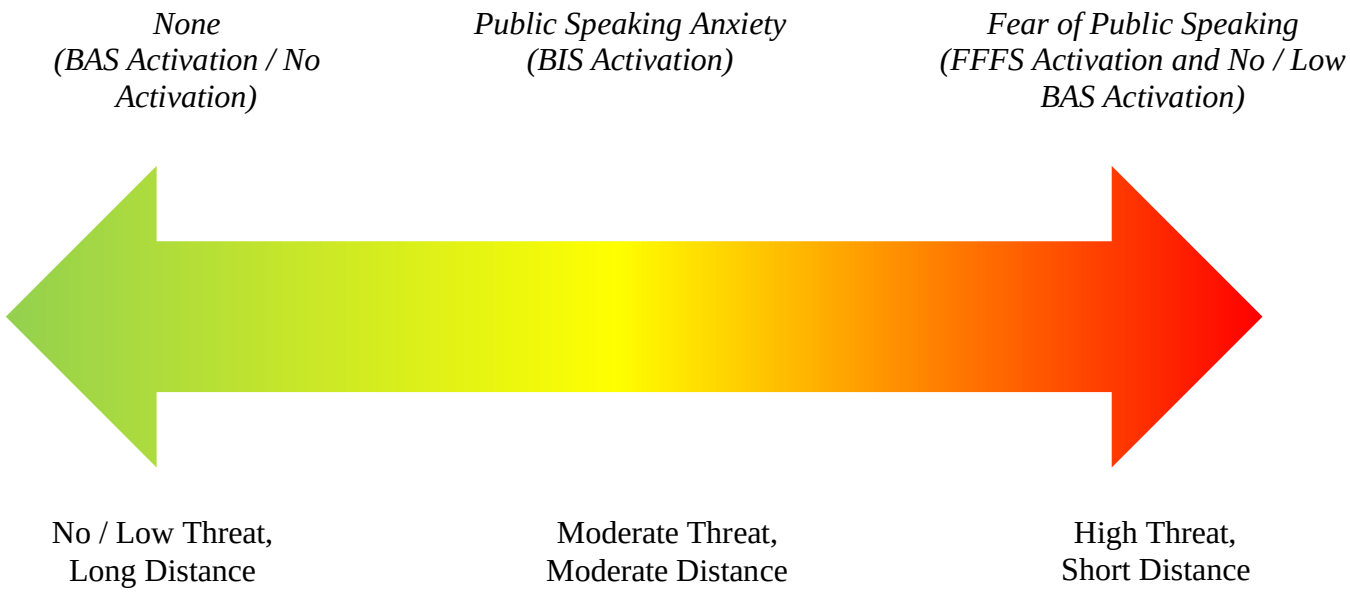
Construct	Definition
Public Speaking	A form of oral communication, typically in front of one or more persons, that tends to be uni-directional, (semi-)formal and has specific verbal and non-verbal components.
Public Speaking Anxiety (PSA)	A situation-specific social anxiety that arises from the actual, anticipated, or imagined delivery of a speech in front of others.
Fear of Public Speaking (FoPS)	A situation-specific fear arising from the actual delivery of a speech in front of others.
Public Speaking Threats	A threat (real or perceived) that arises related to a verbal presentation.

To provide further conceptual clarity, we argue that, instead of dichotomous or synonymous states, PSA and FoPS lie on a continuum relevant to their perceived levels of threat, proximity to threat(s), and activation of the BAS. To illustrate this, we present a new model titled the public speaking threats continuum (PSTC). The PSTC can be used with superordinate (e.g., public speaking), ordinate (e.g., negative evaluation), and subordinate (e.g., audience seeing mistakes) public speaking threats. When an individual perceives there to be little-to-no threat, neither fear nor anxiety is experienced. In certain instances, there may be motivation to approach the threatening stimuli (e.g., financial rewards), activating the

BAS. If a moderate threat is perceived along with BAS activation, approach-avoidance conflict activates the BIS and induces anxiety. Conversely, if there is no motivation to approach (i.e., no BAS activation), the person has appraised the situation as highly threatening, and they are in close proximity to the threat(s) fear will occur (see Figure 5.1). We hypothesise that both motivation and perceived distance from threat mediates an individual's position on the continuum, affecting their experiences of anxiety and fear. We further posit that moderate-to-high threat perceptions increase the probability of performance catastrophes (Hardy, 1990), whereas no/low threat appraisals follow the Yerkes-Dodson (1908) inverted U hypothesis.

Figure 5.1

Public Speaking Threats Continuum



A person's trait PSA or FoPS provides the starting position on the continuum. However, situational factors can increase or decrease their position. For example, a person with moderate trait PSA or FoPS may initially appraise a public speaking situation to have moderate threat as they are concerned with the audience judging them as incompetent. This moderate threat, along with the motivation to speak in front of others (BAS activation),

results in anxiety. However, during the speech, an audience member may ask a challenging question that leads to the presenter stumbling over their words (performance catastrophe). Here, attention may be drawn to the social threat of a situation (e.g., incompetence) and the perceived distance from it also decreases. This increases the perceived threat level, and may induce a fight, flight, or freeze response (FFFS dominance). Therefore, what was once a mild anxiety reaction is transformed into fear. Conversely, if the same person (moderate trait PSA or FoPS) experiences a positive response from the audience during their speech (e.g., smiling and cheering them on), perceived threat levels (including proximity) may decrease, reducing anxiety levels as the BAS achieves dominance over the FFFS.

Existing Research

Chapter 2's systematic review and meta-analysis provided further support for the efficacy of psychological interventions to reduce PSA, echoing and extending the findings of previous research (Ebrahimi et al., 2019; Horigome et al., 2020; Reeves et al., 2022). The review provides further clarity regarding the limitations of previous research by providing a critical narrative synthesis of research in this area (e.g., intervention type and theoretical frameworks). This critical narrative synthesis also provides applied practitioners with a deeper understanding of the potential variables that may improve treatment efficacy.

Chapter 2 highlighted the issue of using a "one-size-fits-all" approach for the treatment of PSA. Owing to the complexity of PSA, such approaches may be counterproductive, as treatments lack effective targeting. However, the Public Speaking Threats Questionnaire (PSTQ) developed and validated in Chapter 3 provides applied practitioners with a simple measure to identify key areas of public speaking threat in a fraction of the time. The 27-item, three-factor model shares similar qualities with Cheng et al.'s (2009) three-dimensional conceptualisation of performance anxiety and Jones et al.'s (2019) three-factor model of competitive anxiety. Regarding gender differences, the results across our three studies found that women scored significantly higher than men on all PSTQ

dimensions. Our findings are consistent with previous research exploring the relationship between gender and PSA (Behnke & Sawyer, 2000) and SAD (Asher et al., 2017).

The results of Chapter 4's Improv Self-Efficacy and Skills Program (ISESP) are contrary to the findings of previous improvisation-based studies (Casteleyn, 2019; Schwenke et al., 2020; Seppänen et al., 2019; Seppänen et al., 2020) who failed to report any main effects across time. Although within-group significance was achieved for public speaking anxiety, discomfort, physiological arousal threats, self-perception threats, self-efficacy, and speech duration, no between-group statistical significance was observed. The relatively small sample size and artificially inflated stress levels of the ISESP group at pre-testing may have contributed to this finding. Regarding public speaking performance, at post-test and follow-up, ISESP participants were able to sustain public speaking performance for longer in the impromptu speech task, indicating a reduction in the effect of PSA on performance. These findings provide initial evidence of the ISESP's effect on delaying performance catastrophes and could have been due to an increase in attentional control, an increase in self-efficacy, a reduction in threat saliency, or a combination of the three. Chapter 4 contributes to a growing body of evidence suggesting that actor and improvisation theatre training can be used as an efficacious and cost-effective methodology for the reduction of PSA and increase in public speaking self-efficacy.

Applied Implications

Several applied implications have arisen from this thesis and are worth discussing.

Effective Interventions

The systematic review and meta-analysis described in Chapter 2 illustrated several effective interventions for reducing PSA. Although the intervention types varied greatly, those involving cognitive modification and exposure therapy were the most common. Cognitive therapies challenged maladaptive thoughts, whereas exposure therapies provided opportunities for incremental exposure and habituation to feared stimuli. Interventions

focused on reducing anxiety symptoms or targeting the source of a person's anxiety. Although symptomatic treatments were highly effective in providing immediate short-term relief, their long-term implications remain unknown. Ayres and Ayres' (2003) script and drawing intervention was the most effective exposure-based strategy and Cunningham et al. (2006; The Lefkoe Method) was the most effective cognitive-based strategy. Several interventions included in the review could be combined to provide a 'package' of treatments. This 'package' could increase cognitive control via cognitive therapies (e.g., Amir, 2008), reduce threat saliency through exposure therapies (e.g., Ayres & Schliesman, 2002), and increase self-efficacy via repeated successful exposure to specific stressors (Bandura, 1997). Although all studies illustrated efficacy, due to limitations in the design and execution of interventions (e.g., lack of public speaking components, details of exposure elements), caution is needed when interpreting the results.

Threat Identification

The ability for individuals and/or applied practitioners to identify specific public speaking threats is essential for the therapeutic process. It compartmentalises the overwhelming generality of finding public speaking situations threatening into manageable, specific threats that can be targeted (e.g., fear of forgetting my content) and overcome. Unfortunately, this area has seen limited exploration across the PSA literature, with most research focusing only on determining the overall level of PSA. The theoretical implications of this thesis and Chapter 3's development and validation of the Public Speaking Threats Questionnaire (PSTQ) demonstrate the importance of identifying threats to aid the assessment and treatment efficacy of PSA.

Actor and Improvisation Theatre

The Improv Self-Efficacy and Skills Program (ISESP) described in Chapter 4 is a multi-modal therapy incorporating skills training, psychological skills training (PST), and exposure therapy. Threat saliency is reduced through repeated, successful exposure to feared

stimuli, and self-efficacy is achieved through mastery experiences, vicarious experiences, and verbal persuasion. As character-based exercises often appear like acting and can be difficult for non-performers to engage with, the authors opted to use more skills-based exercises (see Appendix D), resulting in an expansion (rather than a replacement) of the self. The ISESP allows for rapid, accurate, and frequent exposure-based opportunities, requiring minimal effort that can be quickly adapted to meet the needs of individuals. Furthermore, it can be used to overcome the limitations of traditional exposure-based therapies (i.e., the time and effort required to accurately recreate fear-provoking situations; Horigome et al., 2020). To enable the program to be widely administered in both educational and occupational settings, applied practitioners should undergo formal training in the use of acting and theatrical improvisation exercises for the reduction of PSA.

Public Speaking Anxiety Assessment Best Practices

This thesis argues that several core principles must be adopted to assess the efficacy of PSA interventions effectively. Each of these is discussed below.

1. Public Speaking Component

A pre-post public speaking component is imperative for any study testing intervention efficacy on PSA. Without a pre-and-post assessment of speaking performance, it is very difficult to determine real-world implications of research. Audience size, environment, preparation time, and speech duration should be consistent at each testing stage. Although the speech topic should vary at each assessment point (to prevent prior speech preparation), the difficulty level of each speech should remain constant. To prevent topic familiarity amongst some participants biasing results, speech topics should either focus on personal viewpoints (e.g., a passion you have in life) or be on a subject familiar to all participants (e.g., psychology undergraduates speaking about a psychological theory).

2. Self-Report Measures

Self-reporting is the most common method used to assess intervention efficacy. However, the use of appropriate measures is of utmost importance. When examining PSA, the authors suggest the use of the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970) over the Personal Report of Communication Apprehension (PRCA; McCroskey, 1982). As all 34 items of the PRPSA focus directly on public speaking, it is more reliable to ascertain treatment efficacy when compared to only six items of the PRCA that assess public speaking. However, as the PRPSA is over 50 years old, more recent measures such as Bartholomay and Houlihan's (2016) Public Speaking Anxiety Scale (PSAS) may be worthwhile implementing. The PSAS is a highly reliable and valid 17-item, three-factor model measuring cognitive, behavioural, and physiological manifestations of PSA. Due to PSA's dual nature as both its own subtype of social anxiety disorder (SAD) and as part of a generalised SAD, it may be of value to determine whether a person experiences SAD or if it is only performance-related (i.e., PSA).

3. Threat Identification

The early identification of personal threats to public speaking is essential for therapeutic processes. Without it, interventions may target the wrong source and become too generalised ("one-size-fits-all"), leading to a potential decrease in efficacy. Traditionally, public speaking threats have been identified through discussions and clinical interviews. However, although effective, these methodologies are often time-consuming. The authors advocate the use of the Public Speaking Threats Questionnaire (PSTQ) as both a screening process and a tool to increase the expediency of the interview process. The use of the PSTQ is particularly relevant when assessing large groups (e.g., universities and businesses).

4. Observer, Behavioural, and Psychophysiological Measures

Along with self-reporting assessments of public speaking anxiety, observer, behavioural, and psychophysiological measures are worth considering. Psychophysiological

measures include heart rate monitoring and skin conductance (see Azevedo et al., 2017), and observer ratings focus on assessors scoring individuals' public speaking performance (see Wallach et al., 2009). Psychophysiological assessments are particularly significant in assessing in-the-moment presentations which could be timed to match certain aspects of the presentation itself. For example, if the presenter cannot answer a challenging question, what kind of psychophysiological response may they show and why. To assess behaviour, we would recommend having at least two observers to ensure a high inter-rater reliability. As both psychophysiological measures and observer ratings require training, they may not be appropriate for some studies. Furthermore, an impromptu speech task (see Chapter 4) could be used as a behavioural measure of PSA. For example, participants could be asked to speak for a period of time (e.g., 300 seconds), and if the task ends prematurely, then this could be interpreted as an attempt to escape the anxiety arising from the situation. This would be especially useful if coupled with a psychophysiological assessment of stress (e.g., heart rate monitoring).

Treatment Design Best Practices

This thesis posits that, for the effective treatment of PSA, several treatment design best practices should be adopted. Each of these is discussed below.

1. Treatment Allocation

As previously discussed, identifying specific sources of public speaking threats is essential for therapeutic processes. Furthermore, the intensity of these threats should be considered in treatment allocation. The Public Speaking Threats Questionnaire (PSTQ) provides a 'firing order' for each participant, demonstrating which dimension should be the primary focus point for treatment. For example, if a person had a mean score of 2.7, 1.7, and 4.4, for physiological arousal, self-perceptions, and external judgements threats respectively, interventions should focus on reducing the saliency of external judgements threats before self-perceptions and physiological arousal. Participants should then be grouped by dimension

scores before receiving tailored intervention(s) to reduce threat saliency. In one-to-one situations, the PSTQ ensures that participants receive the most appropriate treatment for their firing order. To ensure that PSA is not artificially inflated during pre-testing, we recommend that treatment assignment occur after all participants have completed pre-testing.

2. ***Exposure elements***

It is clear from Chapter 2 that exposure elements form a key part of many interventions to reduce PSA. Indeed, Chapter 4's Improv Self-Efficacy and Skills Program (ISESP) utilised exposure elements throughout the 12-hour intervention. For those with high PSA levels, traditional in vivo exposure therapies may be too overwhelming. Therefore, mastering in vitro exposure before proceeding to virtual reality exposure therapy (VRET) and then finally advancing to traditional in vivo exposure (which can also be graded) may be beneficial. An exposure hierarchy can be created to determine a person's starting point (e.g., in vitro, VRET, or in vivo). Using the Subjective Units of Distress Scale (SUDS; Wolpe, 1969), individuals rank each potential exposure situation. Individuals should begin with the most manageable situation (e.g., in vitro) before progressing up the exposure hierarchy.

For an anxiety reduction not to be attributable to confounding variables, some variables such as safety behaviours may need to be controlled for (see Salkovskis, 1991). Safety behaviours are those that function to reduce anxiety in the short-term but prevent long-term cognitive change (Thwaites & Freeston, 2005). Safety behaviours include direct avoidance of situations, escape from situations, and subtle avoidance within the situation (Salkovskis et al., 1996). Avoidance maintains or strengthens the perceived threat level, while escape (e.g., leaving a presentation early), results in a 'near miss' appraisal, which may reinforce the use of such behaviour to reduce anxiety. Overpreparation (e.g., avoidance of performance until they are 100% perfect), avoiding eye contact, fidgeting, distraction techniques, and maladaptive behaviours (e.g., drinking and drugs) are examples of subtle

avoidance. As all these behaviours could result in false positives when determining intervention efficacy, researchers need to control for them whenever possible.

Finally, it is important to ensure that performance and social performance catastrophes do not occur during exposure elements. Failure to do so may lead to participant disengagement or treatment withdrawal. If a performance catastrophe does occur, it is important to try to reduce the variable(s) that lead to the catastrophe. Performance catastrophes may occur for a multitude of reasons, such as heightened anxiety, arousal, and increased perceptions of task difficulty (Hardy et al., 2007; Strahan & Conger, 1999). Future researchers and applied practitioners should be mindful of participants' physiological arousal levels and ensure that they do not exceed optimal levels (especially as cognitive anxiety is likely to be already high during exposure treatments). To reduce the probability of performance and social performance catastrophes, practitioners should be aware of relaxation strategies and be prepared to alter exposure elements to allow for within-session habituation.

3. ***Follow-up Testing***

Follow-up testing should be used to determine intervention efficacy over time. While time points will depend on specific study requirements, this thesis recommends at least one follow-up test 6-months post-test. The same pre-post-test design should be used, along with further questions to determine the influence of any potential confounding variables (e.g., a presentation diary). Qualitative analyses may also provide additional information over and above self-report assessments.

Strengths of the Thesis

There are several notable strengths to this thesis. First, conceptual clarity was provided for several terms that had been fraught with ambiguity for many years. Public speaking was clearly defined as "a form of oral communication, typically in front of one or more persons, that tends to be uni-directional, (semi-)formal and has specific verbal and non-verbal components" while public speaking threats was defined as "a threat (real or perceived)

that arises related to a verbal presentation." Additionally, this thesis was the first piece of research to reconceptualise public speaking anxiety (PSA) and fear of public speaking (FoPS) as separate but related entities utilising Gray and McNaughton's (2000) revised reinforcement sensitivity theory. We define PSA as "a situation-specific social anxiety that arises from actual, anticipated, or imagined delivery of a speech in front of others" and FoPS as "a situation-specific fear arising from actual delivery of a speech in front of others." This reconceptualisation provided much-needed clarity to terms that have been frequently used synonymously.

Another strength of this thesis is the design of the systematic review and meta-analysis. Not only did it examine the efficacy of the past 23 years of PSA interventions, but it was also the first of its kind to offer a detailed critical narrative synthesis. The critical narrative synthesis will aid applied practitioners in the selection and delivery of potential interventions. The review also highlighted some key limitations in the treatment and assessment design, which were rectified in Chapter 4.

A penultimate strength was the creation and validation of the Public Speaking Threats Questionnaire (PSTQ). A large sample of 1,088 participants participated in the studies and provided invaluable data for validating the PSTQ. The PSTQ is the first of its kind and allows both individuals and applied practitioners to quickly identify specific public speaking threats, decreasing assessment time (owing to its brevity), and increasing treatment efficacy (through targeted approaches).

A final strength of this thesis was the development and testing of the Improv Self-Efficacy and Skills Program (ISESP) in chapter 4. Testing addressed many of the limitations seen in previous research and provided a methodology for effective testing in future research. By having an expert in the field of presenting and PSA reduction lead the design and delivery of the ISESP, it overcame some of the barriers seen in many mainstream communication courses and student-led programs (e.g., university modules). It also provided evidence to

support the use of improvisation to reduce PSA, where previous research has failed to do so (see Casteleyn, 2019; Schwenke et al., 2020; Seppänen et al., 2019; Seppänen et al., 2020).

Limitations and Future Directions

This thesis is not without limitations. For the systematic review and meta-analysis described in Chapter 2, only studies in which the authors claimed statistically positive effects were selected. Although this inclusion criteria allowed for a detailed critical narrative synthesis of effective studies, it failed to provide a complete picture of public speaking anxiety interventions. Furthermore, the exclusion of non-significant studies may have biased the meta-analytic outcome. Therefore, the results of our meta-analysis should be interpreted with caution. However, there are three recent meta-analyses that include studies that report non-significant results (Ebrahimi et al., 2019; Horigome et al., 2020; Reeves et al., 2022). Readers interested in interventions that do not work can find more information there. Further, due to the majority of studies reporting significant findings in favour of intervention groups, both Ebrahimi et al. (2019) and Reeves et al. (2022) disclosed potential publication bias in their meta-analyses. In contrast, Horigome et al. (2020) reported no publication bias.

While our review could have assessed all possible papers (i.e., that report significant and non-significant effects) on the four intervention types outlined in Chapter 2 (i.e., exposure, cognitive, combined, other), this would have exceeded most journal page limits and impacted our ability to conduct a detailed narrative synthesis. Therefore an area of interest for future research would be to conduct a systematic review and meta-analysis of each intervention type. Including both effective and ineffective studies would provide the necessary information to understand why certain iterations of the same treatment are effective, whereas others are not. Follow-up analyses would allow for the determination of which intervention type is most effective in reducing public speaking anxiety. Alongside a comprehensive analysis of current public speaking anxiety interventions, this would also overcome the limitations of potential publication bias.

The original purpose of the Public Speaking Threats Questionnaire (PSTQ) developed in Chapter 3 was to identify specific threatening stimuli that a person may appraise to be a threat in public speaking situations. We note that there is still some ambiguity surrounding the terms threat, anxiety, and fear and what our measure actually assesses. Previous research has illustrated neurobiological, physiological, and behavioural differences between anxiety and fear (Mobbs et al., 2019). Furthermore, fear is experienced when in close proximity to a threat, whereas anxiety is experienced when the threat is further away (Beckers et al., 2023). The PSTQ is a tool used to identify the sources and frequency of threat(s) that can produce anxiety and/or fear responses. This frequency provides a generalisation of public speaking threats across multiple performance situations and is invaluable for the treatment of public speaking anxiety.

Although determining the frequency of public speaking threats is important, we understand the potential value of assessing the intensity of each threat as well. Therefore, a state version of the PSTQ that measures intensity would be of interest for future research. Removing the word 'generally' from each item would allow the current iteration of the PSTQ to be used as both a trait and state measure. For the trait measure, the 5-point Likert scale ranging from 1 *(rarely)* to 5 *(always)* should remain to determine the frequency of public speaking threats. However, for the state measure, an alternative 5-point Likert scale evaluating intensity should be used (e.g., 1 = *not at all* to 5 = *very much so*).

Another limitation was the use of the website Prolific and potential sampling bias. Although the data received was of high quality, equal representative demographics for ethnicity and employment were not obtained. Future research would benefit from testing the PSTQ in real-world conditions and with a target population (e.g., university students). Conducting a study in which participants complete the measure prior to undergoing a public speaking task would be of interest. Finally, the title of the PSTQ has two limitations. First, the use of the term 'questionnaire' in potentially misleading as all items are statements and

not questions. Second, as public speaking threats are the source of an anxiety response, it may be more appropriate to have the title of the measure reflect that. Therefore, renaming the PSTQ to the Sources of Public Speaking Anxiety Inventory (SPSAI) would more accurately represent the measure developed in Chapter 3.

Another limitation related to study design, sample recruitment, demographics and timing for the Improv Self-Efficacy and Skills Program (ISESP) in Chapter 4. The initial aim was to recruit 100 participants and conduct an effectiveness trial to test the efficacy of the ISESP. However, on reflection our study more closely resembles a feasibility trial due to the limitations encountered. According to Bowen et al. (2010) there are eight general areas of focus addressed by feasibility studies: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited efficacy. Acceptability determines the extent to which the intervention is judged as suitable for both program deliverers and recipients. Demand assesses the appetite of the new program in the organisation. Implementation refers to the extent to which the program could be successfully delivered. Practicality determines the degree to which the program can be conducted using current resources, commitment, and time constraints. Adaptation investigates program effectiveness when changes are made to the format or the target population. Integration assesses the level of change needed to successfully integrate the new program into existing systems and processes. Expansion determines the extent to which a previously successful program can be expanded into a new population or setting. Finally, limited efficacy assesses whether the new program shows promise of being successful with the intended audience. Several areas of focus relevant to the ISESP are discussed below.

Regarding acceptability and demand, the ISESP had mixed reactions from university staff and students. As we were unable to offer any monetary reward or course credit to undergraduates, only those who were highly motivated to reduce their public speaking anxiety and increase their public speaking skills participated. While many staff saw the

benefits of such a program to enable students to excel in public speaking situations, some staff members had their own agendas regarding the development of students' presentation skills and refused to support the advertisement and implementation of the program. These barriers resulted in only 22 participants being included in the final sample. Furthermore, recruitment had to be expanded from the initial population of undergraduates to include postgraduates. To increase the acceptability and demand from both staff and students, future research would benefit from several recommendations. First, by educating university staff on the benefits of the ISESP and how the program could positively impact their academic performance, they could be in a better position to understand its value and encourage students to participate. Second, the use of extrinsic motivators (e.g., financial rewards and course credits) may increase student recruitment rates.

Although the implementation of the ISESP was successful, the assessment of practicality highlighted some limitations. As participant recruitment came from across the university, scheduling six, two-hour workshops was difficult, with some participants becoming unavailable due to timetable clashes. Another limitation was that the first author was the only one trained in the assessment and delivery of the ISESP, making it difficult to administer the program widely. To overcome this scheduling limitation, the ISESP should be scheduled into students' timetables at the beginning of a semester or given priority over other classes for the duration of the program. For example, recruitment could occur from the same course (e.g., 1st-year psychology students), and half of the year could participate in the ISESP in term one, while the other half acted as the wait-list control group. In the second term, the wait-list control group can receive the ISESP. To enable the ISESP to be widely administered, program deliverers should undergo formal training in assessment processes and the use of acting and improvisation exercises to reduce public speaking anxiety.

Examining the limited efficacy, the ISESP shows promise in being successful with the intended population of university students. Therefore, future research should incorporate all

the above recommendations to allow for a successful pilot study of the ISESP on a larger sample. The authors note that, as each organisation has its own complexities, future studies may also benefit from conducting their own feasibility trials to understand and overcome any organisation-specific limitations before running a pilot study.

Future Research

The construct of public speaking anxiety (PSA) is one that has almost a limitless area of potential research. Expanding on these limitations, future research should be conducted in several areas. First, additional studies should explore the predictive validity of the PSTQ using a larger sample size. A state version of the PSTQ would also be of interest, exploring correlations between dimension scores and psychophysiological measures (e.g., heart rate, skin conductance). Furthermore, the examination of an adapted PSTQ in other performance domains (i.e., acting, singing, dancing, and sports) would be of interest. A natural progression of the work seen in Chapter 4 would be to analyse differences in program length (e.g., one-off versus multi-session) alongside gender and ethnicity differences in treatment efficacy.

Another key area for further research centres on Gray and McNaughton's (2000) revised Reinforcement Sensitivity Theory (rRST) and PSA. While this thesis explored the fight-flight-freeze system (FFFS) and behavioural inhibition system (BIS), the behavioural activation system (BAS) remained dormant in our analyses. Further work is needed to fully comprehend these motivational systems and their role in mediating PSA. In particular, examining the interactive effectives (if any) between the BAS and PSA and how it can be activated in public speaking situations.

Although Chapter 1 introduced Eysenck et al. (2007) attentional control theory (ACT) as a potential explanation for how anxiety impacts working memory and public speaking performance, it was beyond the scope of this thesis to explore it in depth. Payne et al. (2019) found that improving a performer's attentional control reduces self-focus and bottom-up saliency (e.g., task-irrelevant cues). This is of particular relevance for public speaking if

threats are from internal sources (e.g., physiological arousal and self-focused threats). Furthermore, Jones et al. (2012) found that attentional control acts as a buffer to protect individuals from the negative impact of PSA on public speaking performance. Therefore, further research should investigate potential treatments to increase attentional control in public speaking situations.

Previous research has found that depletion of cognitive resources before a performance task can lead to a reduction in attentional control (Betrams et al., 2013; Englert et al., 2015). Therefore, if resources are drained (e.g., owing to stress), the probability of task-irrelevant cues (e.g., public speaking threats) being inhibited is reduced (due to bottom-up saliency dominance). Further research should explore the effects of depleting and increasing cognitive resources before a public speaking task. This would replicate the real-world cognitive resource depletion seen in many organisations (e.g., due to workload stresses).

The final area worth discussing for future research is self-discrepancy theory (SDT; Higgins, 1987) and its relationship with PSA. Although a thorough discussion of SDT is beyond the scope of this thesis, we have included a brief summary here. According to SDT, people hold beliefs about how they view themselves (actual self), what they aspire to be (ideal self), and what they should be (ought self). Carver et al. (1999) proposed a fourth 'feared self' as a means of explaining the motivational forces occurring as an individual moves away from a negative self and towards a positive one. The APA Dictionary of Psychology defines a feared self as "a mental representation of psychological attributes that one might possess in the future, in which thoughts about the acquisition of these attributes elicit a sense of anxiety or dread" (Vandenbos, 2007). Essentially, it is a set of characteristics that a person wants to avoid having or becoming in the future.

A person continuously self-evaluates to determine whether their actual self (self-concept) is congruent (or incongruent) with their ideal, ought, or feared selves (Carver et al., 1999). If self-evaluation suggests that the person has failed to meet the standards attributed to

the ideal/ought self, a self-discrepancy will occur, resulting in psychological distress. Furthermore, if a person perceives themselves to be close to a feared self (e.g., I am poor at public speaking), they will also experience distress. Dejected-related emotions (e.g., disappointment) occur with ideal discrepancies, while agitation-related emotions (e.g., anxiety) occur with ought discrepancies and feared self-congruencies. Woodman and Hemmings (2008) found that feared self-congruencies were a more significant predictor of anxiety than ought discrepancies. To reduce ideal/ought discrepancies or feared self-congruences, performance profiling (e.g., Butler & Hardy, 1992) or the PSTQ developed in Chapter 3 may be an ideal way of identifying such discrepancies, allowing for interventions to ensue.

In the case of PSA, self-guides could provide a further understanding of the sources of public speaking threats. For example, if a person's most pressing public speaking threat was concern over making mistakes, this could stem from multiple self-guides. A person's ideal self-guide could be the desire to be perfect, whereas their ought self-guide might believe that mistakes should not occur. Conversely, the feared self-guide may denote a previous version of the self in which mistakes were common and the consequences of said mistakes were unfavourable. Furthermore, as evaluations are continuous, it can be very easy for a person to experience something during a public speaking situation (e.g., making a mistake) that causes either an ought discrepancy to increase or feared self-congruence to increase. Further studies should explore the identification and reduction of ideal/ought discrepancies and feared self-congruencies to reduce overall PSA.

Conclusion

In summary, this thesis aimed to provide conceptual clarity regarding the concept of public speaking anxiety (PSA), identify effective PSA interventions, develop and validate a new measure to identify public speaking threats, and test the efficacy of a novel intervention to reduce PSA and increase public speaking self-efficacy. The systematic review and meta-

analysis identified key limitations in the conceptualisation, assessment, and treatment of PSA. To rectify the limitations of conceptualisation, this thesis drew upon Gray and McNaughton's (2000) revised Reinforcement Sensitivity Theory (rRST) to reconceptualise PSA and FoPS. To improve the assessment limitations, a new measure was developed and validated for the identification and categorisation of public speaking threats. The final model achieved an excellent model fit, criterion validity, and good test-retest reliability. Finally, we tested a novel multi-modal intervention comprising acting and improvisational theatre techniques on a university sample. Rectifying many of the limitations of previous research, the results indicated that participation in the 12-hour program led to significant reductions in PSA and increases in self-efficacy and distress tolerance. However, no between-group significance was observed. The findings of this thesis present a comprehensive exploration of PSA and have significant implications for how it is conceptualised, assessed, and treated. The negative impact of PSA at both an individual and organisational level is extensive. However, we hope that the evidence from this thesis will improve the efficacy of current interventions and pave the way for further research to promote long-term positive changes.

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Note: (*= Papers included in the systematic review and meta-analysis)

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Appendices

Appendix A: The Public Speaking Threats Questionnaire (PSTQ) 62-Item Version

Below is a list of statements used to describe how people feel about public speaking. Please read each statement and indicate the degree to which each one applies to how you **GENERALLY** feel about public speaking. There are no right or wrong answers. Please do not leave any statements blank.

Physiological Arousal	**NEVER**	**RARELY**	**SOMETIMES**	**VERY OFTEN**	**ALWAYS**
1. Generally, I worry about having butterflies in my stomach.	1	2	3	4	5
2. Generally, my mouth or throat going dry worries me.	1	2	3	4	5
3. Generally, my heart beating too fast or too loud would worry me.	1	2	3	4	5
4. Generally, I worry that my voice will tremble when I speak.	1	2	3	4	5
5. Generally, I'm worried that my body is going to tremble or shake uncontrollably.	1	2	3	4	5
6. Generally, I am worried that I might sweat a lot (i.e., forehead or armpits).	1	2	3	4	5
7. Generally, I worry that my face may go red.	1	2	3	4	5
8. Generally, I'm worried that I will be sick.	1	2	3	4	5
9. Generally, I worry that I might faint.	1	2	3	4	5
10. Generally, I'm worried that I won't be able to breathe properly.	1	2	3	4	5
11. Generally, I'm worried that I will be unable to speak.	1	2	3	4	5
12. Generally, I worry that I will be paralysed with fear.	1	2	3	4	5
13. Generally, I worry that I will fidget too much.	1	2	3	4	5
14. Generally, I'm worried that I won't be able to control my anxiety symptoms.	1	2	3	4	5

Self-perceptions	**NEVER**	**RARELY**	**SOMETIMES**	**VERY OFTEN**	**ALWAYS**
15. Generally, I worry that I won't be perfect.	1	2	3	4	5
16. Generally, I'm worried that I won't be good enough.	1	2	3	4	5
17. Generally, I'm worried that I won't have prepared enough.	1	2	3	4	5
18. Generally, having to make eye contact with the audience worries me.	1	2	3	4	5
19. Generally, I worry that I won't be able to get everything across in the given time.	1	2	3	4	5
20. Generally, I'm worried about how my voice will sound (e.g., talk funny, accent, vocal quality).	1	2	3	4	5
21. Generally, I worry that I won't be able to speak fluently (e.g., use of filler words, ums, ers, etc).	1	2	3	4	5
22. Generally, making a mistake worries me.	1	2	3	4	5
23. Generally, I'm worried about being worried (being in my own head).	1	2	3	4	5
24. Generally, I'm worried that I won't be able to use my voice effectively.	1	2	3	4	5
25. Generally, I worry that I will speak too fast.	1	2	3	4	5
26. Generally, my voice being too monotonous (one level) worries me.	1	2	3	4	5
27. Generally, my voice being too quiet worries me.	1	2	3	4	5
28. Generally, I'm worried that I won't be able to use my body effectively.	1	2	3	4	5
29. Generally, not knowing what to do with my hands and arms worries me.	1	2	3	4	5
30. Generally, I worry that I won't be able to use technology or be able to fix it if it breaks.	1	2	3	4	5
31. Generally, I'm worried that I will forget my words (brain freeze).	1	2	3	4	5

External Judgement (Performance)	**NEVER**	**RARELY**	**SOMETIMES**	**VERY OFTEN**	**ALWAYS**
32. Generally, I worry that others will judge how I sound.	1	2	3	4	5
33. Generally, I worry that people will think I'm boring.	1	2	3	4	5
34. Generally, I'm worried that the audience will find fault in appearance.	1	2	3	4	5
35. Generally, making the wrong impression on the audience worries me.	1	2	3	4	5
36. Generally, I worry about being judged in a negative fashion (e.g., inadequate, inferior, incompetent).	1	2	3	4	5
37. Generally, I'm worried that the audience won't like me.	1	2	3	4	5
38. Generally, I worry about the feedback I will get regarding my presentation.	1	2	3	4	5
39. Generally, I am worried that the audience will laugh at me.	1	2	3	4	5
40. Generally, I'm worried that the audience will think I don't know what I'm talking about.	1	2	3	4	5
41. Generally, I worry that I will embarrass myself in front of the audience.	1	2	3	4	5
42. Generally, failing worries me.	1	2	3	4	5
43. Generally, I'm worried the audience will think I am not good enough.	1	2	3	4	5
44. Generally, I worry I may not be able to answer questions.	1	2	3	4	5
45. Generally, I'm worried that the audience will see that I'm nervous.	1	2	3	4	5
46. Generally, I'm worried that the audience will see me not speaking fluently (e.g., using filler words, ums, ers, etc).	1	2	3	4	5
47. Generally, I am worried about the audience seeing me making a mistake.	1	2	3	4	5
48. Generally, I am worried about what the audience will think of me.	1	2	3	4	5

External Judgement (Content)

	NEVER	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
49. Generally, I am worried that people will think my topic /content is boring.	1	2	3	4	5
50. Generally, I'm worried that people will find fault in my topic.	1	2	3	4	5
51. Generally, I worry that what I say won't make sense to the audience.	1	2	3	4	5
52. Generally, not providing the audience with accurate information worries me.	1	2	3	4	5
53. Generally, I am worried that people will react negatively to what I have to say.	1	2	3	4	5
54. Generally, I worry that the audience will know more than I do.	1	2	3	4	5

External Judgements (General)

	NEVER	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
55. Generally, everyone watching me speak worries me.	1	2	3	4	5
56. Generally, I worry about getting unexpected responses from the audience (e.g., interruptions).	1	2	3	4	5
57. Generally, I worry that someone will ask me a question that I don't know the answer to.	1	2	3	4	5
58. Generally, speaking in front of my superiors (e.g., boss, teacher) worries me.	1	2	3	4	5
59. Generally, I'm worried about speaking in front of my peers (e.g., colleagues, friends).	1	2	3	4	5
60. Generally, speaking in front of those who are beneath me (e.g., employees, students) worries me.	1	2	3	4	5
61. Generally, people not being interested in my talk worries me.	1	2	3	4	5
62. Generally, I'm worried that I might get distracted by the audience.	1	2	3	4	5

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Appendix B: The Public Speaking Threats Questionnaire (PSTQ) 27-Item Version

Below is a list of statements used to describe how people feel about public speaking. Please read each statement and indicate the degree to which each one applies to how you **GENERALLY** feel about public speaking. There are no right or wrong answers. Please do not leave any statements blank.

	Never	Rarely	Sometimes	Very Often	Always
1. Generally, I worry about having butterflies in my stomach.	1	2	3	4	5
2. Generally, my mouth or throat going dry worries me.	1	2	3	4	5
3. Generally, I worry that my voice will tremble when I speak.	1	2	3	4	5
4. Generally, I am worried that I might sweat a lot (i.e., forehead or armpits).	1	2	3	4	5
5. Generally, I worry that my face may go red.	1	2	3	4	5
6. Generally, I'm worried that I will be sick.	1	2	3	4	5
7. Generally, I'm worried that I won't be able to breathe properly.	1	2	3	4	5
8. Generally, I worry that I will fidget too much.	1	2	3	4	5
9. Generally, I'm worried that I won't be able to control my anxiety symptoms.	1	2	3	4	5
10. Generally, I worry that I won't be able to get everything across in the given time.	1	2	3	4	5
11. Generally, I'm worried about being worried (being in my own head).	1	2	3	4	5
12. Generally, I worry that I will speak too fast.	1	2	3	4	5
13. Generally, my voice being too monotonous (one level) worries me.	1	2	3	4	5
14. Generally, not knowing what to do with my hands and arms worries me.	1	2	3	4	5
15. Generally, I'm worried that I will forget my words (brain freeze).	1	2	3	4	5
16. Generally, performing poorly worries me.	1	2	3	4	5

	Never	Rarely	Sometimes	Very Often	Always
17. Generally, I worry that people will think I'm boring.	1	2	3	4	5
18. Generally, I worry about being judged in a negative fashion (e.g., a bad speaker).	1	2	3	4	5
19. Generally, I worry that I will embarrass myself in front of the audience.	1	2	3	4	5
20. Generally, I'm worried that the audience will see that I'm nervous.	1	2	3	4	5
21. Generally, I'm worried that the audience will see me not speaking fluently.	1	2	3	4	5
22. Generally, I am worried about the audience seeing me making a mistake.	1	2	3	4	5
23. Generally, everyone watching me speak worries me.	1	2	3	4	5
24. Generally, I worry about getting unexpected responses from the audience (e.g., interruptions).	1	2	3	4	5
25. Generally, I worry that someone will ask me a question that I don't know the answer to.	1	2	3	4	5
26. Generally, speaking in front of my superiors (e.g., boss, teacher) worries me.	1	2	3	4	5
27. Generally, I'm worried about speaking in front of my peers (e.g., colleagues, friends).	1	2	3	4	5

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Appendix C: Presentation Diary

Instructions: Please fill out this form and return it at the end of the study. Each week insert the number of verbal presentations that you have delivered at Bangor University.

Participant Name:	

Week	Number of verbal presentations delivered
W/C 14th November	
W/C 21st November	
W/C 28th November	
W/C 5th December	

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Appendix D: ISESP Exercises

Exercise	Format	Focus	Brief Description
Rock Paper Scissors	Whole Group	Warm up	Everyone pairs off and faces their partner. They will play a game of Rock / Paper / Scissors. With the rhythm, 3, 2, 1,GO. If it is a draw, keep going until there is a winner. If you lose, you are now in the winner's fan club. The winner will go find a new winner and play them. While you are in someone's fan club you will clap and cheer their name. If you lose your next game, the winner gets you and all your fan club members and they support them. Keep going until there are only two people left with large fan clubs behind them. They will then play each other to decide who is the ultimate champion.
Name Game	3's, 4's, 5's	Names	**Round 1** Everyone get into a circle. A beat will start with the stamping of the feet. (Similar to can't dance like this). The first person will say their name on beat one. The rest of the group will point at them and repeat their name on the third beat (1,2,3,4 stamps). This continues round the circle once. The game continues round the circle but each time there is an increase in tempo. **Round 2** Split the group into smaller groups of 5-8. Each group will play their own version of this game passing names around the circle, with the rhythm of 1 to 2. E.G., Alex to John, John to Steve, Steve to Chris, etc. If you make a mistake, hesitate etc you shout, "OH NO", own the error and run and join another group. This continues with everyone moving around and switching groups.

Exercise	Format	Focus	Brief Description
Uncommon Commonality	2's, 3's, 4's, 5's, 10's, 20's	Breaking down barriers	Everyone gets into pairs. You can repeat this exercise, increase the group sizes until you have the whole group. In your groups find out: What do we have in common, either with another person or with everyone? Go beyond the surface. (eye colour, hair colour, limbs, clothes, etc) You have 5 minutes to find as many as possible. **Example** Does everyone have a younger brother? Have most people seen a musical in the last year? Are some people football fanatics or opera buffs or amateur cheese makers?
Yes Game	Whole Group	Eye contact, unconditional positive regard	**Round 1** Players stand in a large circle. Player 1 says their own name as they point to another player across the circle. That player does the same thing - points to someone as they say their own name. Play continues this way until players feel comfortable that they are getting to know other players' names. **Round 2** Now when a player points to someone else in the circle, they say that player's name instead of their own. Play continues along these lines until everyone has been included at least once and everyone appears to know at least a number of names. **Round 3** Player 1 will point to another player (e.g. Player 2). Player 2 must say "Yes" to Player 1 before Player 1 can move out of the place they are standing in the circle. The "Yes" is essentially giving permission to the player to move. Player 1 starts to walk towards Player 2 to take Player 2's space. Player 2 must get permission from someone else to vacate their space and open it up for Player 1. Play continues with playing pointing to others, getting permission to move (the other saying "Yes"), and moving to the new space. It is very important that a player not move until given permission.

Exercise	Format	Focus	Brief Description
Presents V1	Pairs	Creativity	**Round 1** Everyone pairs off and faces their partner. One person will give the other a present and defines what it is (e.g., a ball). The other person accepts it, thanks them and adds some objective details (It's red). NOT subjective (I love it). **Round 2** One person presents an object, but the other person defines it. **Round 3** Antiques Roadshow. One person is bringing the item. The other person is the expert, giving its history, valuation, etc.
Presents V2	Whole Group	Creativity, adaptability	Everyone gets into a circle. First person (Player A) gives an imaginary gift to the person on the left (Player B). Player B will say "thank you for the XXXX" Player A will then need to justify why they gave that person that particular gift. Player B then gives a gift to Player C and repeats the process. This keeps going round the circle until everyone has had a go.
Yes No, Yes But, Yes And	Pairs	Unconditional positive regard, creativity, rejection	**Round 1** Everyone finds a partner. Now you and your partner are going to go on a picnic together. You take turns suggesting things you could do or things you could bring on a picnic - but you are also going to kill every idea your partner comes up with. E.G. "I've got strawberries" "NO, Yuck I hate strawberries, they give me a rash all over…I brought…etc" Switch over.

Exercise	Format	Focus	Brief Description
			Round 2 Same as round 1 but this time, you are going to "Yes, but" every idea your partner comes up with. but without any enthusiasm. I want you to be a bit grading, maybe even a bit upset. But you do accept your partner's ideas, their suggestions do make it into the basket, you are going to do them. However, once you've said yet, you them give a reason why it won't work. E.G. "Do you want some Chips?" "Chips? Really? I know you like them, but they are so unhealthy and fattening, and I'm on a diet, but I suppose I could have on. What about playing it?" "Hmmm okay, maybe a bit later when I'm not so tired" etc. Switch over. **Round 3** Pairs, one person suggests a holiday suggestion. The other person just says YES, AND…and gives another thing they can do. Keep repeating this back and forth until you have a long holiday adventure.
Yes And, Yes But	Pairs	Adaptability	**Round 1** In pairs you are going to have a conversation about work. Start with a statement. One of you is going to say YES AND to everything, the other person is going to say YES BUT to everything. The YES ANDERS have to see the positive / solutions to all the problems that happen as a result of YES BUTTERS. Switch over. **Round 2** This can be performed in front of the group.
Can't Dance Like This	Whole Group	Creativity	Everyone stands in a circle. A topic which a lot of things can be named for is mentioned. E.G. Countries, Fruit, Veg, Cars, etc. We go round the circle one by one naming that item. Before each one we all say "Can't dance like this" together. Every 2 or 3 rounds a new topic is chosen.

Exercise	Format	Focus	Brief Description
10 Things	Whole Group	Creativity, suspended judgement, unconditional positive regard	Everyone stands in a circle. One person jumps into the centre of the circle. The group or facilitator gives them a topic that they have to name 10 things for. E.G - modes of transport. The person in the middle then shout out 10 of those things. After each thing, the group counts 1-10, and after the 10th one we give them a round of applause. **Tips** The aim is to keep to the same rhythm, even if you can't think of something, say anything, just keep in time. There is no wrong answer! Whatever you say is right!
Repetition (whole line, last word/phrase)	Pairs	Listening	Everyone gets into pairs. Participants are going to hold a conversation. They can talk about anything they'd like. The only rule is they must start each of their sentences with the last word their partner just said.
Take 5	Pairs	Silence habituation	Everyone gets into pairs and faces their partner. You are going to have a conversation, but you have to wait 5 seconds before replying.
And That's All	Pairs	Precision in speech	Everyone gets into pairs. You will hold a conversation about any topic. At the end of each part of dialogue, the speaker will add the phrase "and that's all."
Stories - Yes	Pairs	Storytelling, unconditional positive regard	**Round 1** One person recites a story. The second person smiles, nods their head, and helps out with details when the other person is struggling. Like names, locations etc. After 60 seconds, switch over.

Exercise	Format	Focus	Brief Description
			Round 2 One person recites a story. The second person smiles, nods their head, but every so often they can block them by saying “no it didn’t happen like that” and making the storyteller change a part of the story. Then when they are happy they can nod and smile and keep encouraging them. After 60 seconds, switch over. **Round 3** One person recites a story, the second person tries to mirror them at the exact same time. After 60 seconds, switch over. **Round 4** One person makes up a story, the second person mirrors it, and then takes over and carries the story on. Keep swapping whenever someone is struggling. After 60 seconds, switch over. **Round 5** Both of you will say a line of the story each. Every time you start with “yes and” and can either say a line of narrative or a line of description. After 60 seconds, switch over. **Round 6** In a group of 5, they recite a story in front of the rest of the group. After 60 seconds, switch over.
Reflections from the session	Whole Group	Self-reflections	Participants to reflect on the session and discuss thoughts and feelings with the coach and group.

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