

Understanding The Characteristics Of Music Performance Anxiety Among Singers

COMPONENT 1 - PORTFOLIO

Introduction & Rationale:

The impact of music performance anxiety (named as MPA) has been studied among instrumental musicians (Barros et al., 2022; Lupiáñez et al., 2021) and singers (Barefield, 2012; Hu, 2024; Kokotsaki and Davidson, 2003). Singers have been included in the sample population of various music performance anxiety studies (Barbar, Crippa and Osório, 2014; Dobos, Piko and Kenny, 2018; Irie, Morijiri and Yoshie, 2023; Oudejans et al., 2016; Paliaukiene et al., 2018; Patston and Osborne, 2016; Ryan, Andrews and Tsang, 2024) and have been reported to experience MPA. However, there are very few studies that have focused on studying MPA specifically among singers as “singers are under-represented in the MPA literature” (Henshaw and Collyer, 2022). Other authors also agree that studies to understand the performance anxiety among singers are very few (Hunnicut and Winter, 2011a; Ryan and Andrews, 2009). Hence there is a gap in the literature which specifically focuses on the characteristics of MPA as experienced by singers. Sokoli, Hildebrandt and Gomez, (2022) further emphasize the need to study instrument specific MPA characteristics as lived by each instrumentalist as MPA is a lived phenomena (Kenny, 2012). Hence this study tries to fill that gap by exploring the lived experiences and manifestations of MPA in singers.

I am a singer, voice teacher and a community choir conductor in New Delhi, India. Being a singer myself and having worked with student vocalists one to one in my private studio and with choristers in the choir, I have seen in my practice, how a singer’s anxious feelings about singing, named music performance anxiety, could affect their performance and rob them of the joy of singing and sometimes stop them from singing itself (Perdomo-Guevara and Dibben, 2024). As Merton (1972) states that insiders “share the deepest concerns of the group”, this makes me an insider researcher whose interest in this study topic has come out of my own practice and experiences. Being an insider researcher gives greater advantage for me while understanding and collating the MPA related characteristics in singers. However

I'm aware that being an insider also poses a challenge to overlook certain aspects of MPA as not related to singers and not consider it so important for the study as an outsider would look at them (Saidin, 2016). As a voice teacher in India, where there are hardly any formal music universities teaching voice pedagogy, this is a relevant area of study personally for me to gain insight and also for the broader voice community to fill this knowledge gap and to understand if there is any specific relationship between singers and the MPA characteristics associated with them. Since music educators play a significant role in helping students handle performance anxiety (Mazzarolo, Burwell and Schubert, 2023; Patston, 2013), I believe that a singing teacher's role in identifying and helping these anxiety issues among singing students is crucial (Barefield, 2012) and hence a singing teachers need to develop an understanding of MPA (Patston, 2013) as manifested among singers.

2. Planned Programme of Study:

All musicians experience MPA at one point in their career (Helding, 2016). Singers are a unique population among the general musicians. Although MPA affects all musicians, the way it affects singers may be unique as singers are reliant on their voice as an instrument (Barefield, 2012); Singers are creators of art and at the same time the instruments themselves (O'Bryan, 2015; Vitale, 2013). Titze (2022) affirms it stating that in singing both the player and the instrument are 'tightly packed' and so for singers, "singing is an embodied way to interact with others and the world" (Juntunen, Arlin and Katri Liira, 2023). Hence considering that one's voice is a part of their emotional and physical being, singers can feel like their inner being is exposed (Henshaw and Collyer, 2022) leading to fear and anxiety while performing. Because of these reasons, the fears that singers face during a musical performance might be different. Hence understanding the manifestations of MPA in singers is important and needs to be studied separately. By studying the unique MPA experiences of singers, voice teachers can offer help that is focussed.

Therefore the **aim** of this study is to understand the instrument specific MPA characteristics and manifestations, factors contributing to it and the role of gender in MPA, as evidenced especially among singers so that the outcomes of the study will offer added insight for me and the wider body of voice practitioners in understanding this phenomenon.

Learning outcomes:

- To fill my own knowledge gap in this field by understanding the MPA manifestation and characteristics in singers

- To develop an understanding of the relationship between gender and MPA in singers.
- As a practitioner-researcher I would have learnt to be able to apply the knowledge gained through this study in my studio practice by being able to effectively diagnose the MPA manifestations in singing students and become a better practitioner.
- To inform the wider singing community of the unique MPA characteristics that are experienced by singers.

Research questions give direction and focus to the literature review (Kishore, Vasundhra and Anand, 2011). The questions that this study attempts to answer are:

1. *How do singers experience MPA and are these MPA characteristics specific to their instrument?*
2. *How does MPA manifest in singers and what are the factors contributing to either adaptive or debilitating MPA?*
3. *What is the relationship between gender and MPA manifestations?*
4. *How might these findings on MPA characteristics of singers be useful for a voice teacher in identifying MPA among singers in their studio?*

Since MPA is quite a wider subject I am adopting a rapid review to obtain an overview of the subject. Rapid reviews help in synthesising the evidence in a timely manner (Devane et al., 2024). Hence it is suitable for this study considering the limited time frame available to complete this study. The data obtained from the articles are authors, details of methods used and outcomes as listed in Appendix A. Using a deductive thematic analysis explained by Braun and Clarke (2006), I intend to arrange the data into these predetermined themes:

- (1) Factors contributing to adaptive or maladaptive MPA,
- (2) Manifestations of MPA in singers
- (3) Role of gender MPA.

The reason for using a thematic analysis is due to its flexibility in its application (Braun and Clarke, 2006) irrespective of the methodology used. By using deductive analysis approach, I have allowed the existing theories and research to provide a framework for interpreting the current data (Braun and Clarke, 2021) and the way I would derive meaning out of it.

As a voice practitioner, although I believe that this study would help me gain insight into singers' perception of MPA and their physical and psychological responses to it, I am equally aware of my own boundaries as a practitioner and not to overstep. Scott (2022) emphasizes that practitioner researchers must exert caution while interpreting data which are beyond their analytic skills, hence my chosen method of deductive approach to data analysis serves

as a guardrail to this project. A potential pitfall of this study would be delving too much in the area of psychology to study the cognitive dimensions of MPA or to use the results of this study on learners who may actually need professional psychological help. As a voice teacher, using the knowledge gained from this study, my role is not to give clinical diagnosis (Hunnicut and Winter, 2011a) but to refer the students to external specialists like psychotherapists when more personal issues unrelated to music performance are observed (Mahony, Juncos and Winter, 2022) or when extreme debilitating performance anxiety is observed in the studio (Hunnicut and Winter, 2011a). As practitioner researchers' knowledge is generally rooted with a specific orientation toward application (Winter, 2020), through this study I would be looking for pedagogical application that might be helpful for singing teachers to use in their studio practice.

3. Methodology

For this study, I have adopted 'hermeneutic phenomenology' as the methodology. Phenomenological research focuses on giving meaning or interpretation of text devoid of the researcher's personal bias (Lavery, 2003). However in hermeneutics, understanding of text is through the socio-historical context (Boell and Kecmanovic, 2014) and hence the researcher's bias is welcomed. In hermeneutic phenomenology, the meaning arises from the interpretive interaction between the historically situated texts and the reader. Hermeneutic phenomenology is concerned with the interpretation of the experiences of individuals as it is lived out (Lavery, 2003). It places the experience in its historicity and the context in which it happened (Boell and Kecmanovic, 2014).

The purpose of this enquiry is to explore those singer specific MPA characteristics and to understand them. This kind of inquiry of understanding the phenomena of MPA sits well within the phenomenological framework as proposed by Randolph (2009). Phenomenology when used in literary analysis explores the relationship between the world and consciousness (Kotte, 2024). I think that applying this framework for review allows researchers to examine the text, their engagement with the text and how their interpretation of the text is shaped by their own feelings and biases. As meaning emerges from the interplay between the texts and the researcher's consciousness through iterative hermeneutic circles, it creates an immersive reading experience allowing for deeper explorations of themes. Randolph (2009) has also proposed phenomenology as a review technique and has advocated that the articles chosen for review, although secondary in nature, can be considered as the units for analysis.

Phenomenology has been used to study the different aspects that singers might experience in their lives. Kenny (2012) in her writings has explored MPA through the lens of phenomenology as the feelings and behaviours accompanying MPA are lived out by the performer. Similarly another study by Cupido (2018) used phenomenology as the methodology to study the manifestations of MPA and perfectionism in the lived experiences of singer-singing teachers. Since the act of singing is an embodied experience (Juntunen, Arlin and Katri Liira, 2023) and studies (Cupido, 2018; Kenny, 2012; Papageorgi, 2020) have shown that the experience and manifestations of MPA does not happen in a vacuum but is always context driven, it is appropriate to study MPA by combining hermeneutics and phenomenology. Also, considering the fact that I am a singer and a singing teacher who has also experienced performance anxiety and has begun this study with 'pre-understanding' of this subject, hermeneutics allows me to embrace those presumptions and biases (Boell and Kecmanovic, 2014) as I approach this study and places the importance of this study in relevance to my current context. Hence hermeneutic phenomenology as a chosen methodology helps in uncovering the MPA related experiential meanings lived out by singers in their particular historical and cultural situation.

In a hermeneutic phenomenological study, participants should have real experiences about the phenomenon which is being studied (Ramsook, 2018). Hence the articles chosen for this review are those which involved singers in the sample. Articles without singers were therefore excluded. Since, this study aims to explore the singer specific MPA characteristics, having articles in which singers are present allows the opportunity to attribute the outcomes of this study to singers. But only very few studies ($n=5$) consisted of participants with full singers. The rest all had other musicians as well in the sample. This makes it difficult to clearly state the percentage of the study outcomes that can be attributed to singers. However a cut-off of 10% singers representation in the participants was used while selecting the articles. Although inclusion of review articles would have provided a valuable triangulation, it was hard to find reviews that specified the percentage of the singing population. The following are the criteria used in the selection of articles for this study:

Inclusion Criteria:

1. Types of studies - articles reporting original research; using either or both qualitative and quantitative methods. No review articles were included;
2. Only peer reviewed articles were chosen to increase the credibility of this study.
3. Types of participants - preference has been given to studies that included singers, vocalists or singing teachers. A minimum of 10% representation of singers must be

there in study participants. Articles with participants less than 10% of singers were excluded from this study.

4. Only studies with the publication language in English were chosen and the publication status was final.

Process of Data collection:

Method:

1. All articles with criteria mentioned above were collected. This was done using the search keywords using the UWTSD library website. Most articles were taken from Sage, Taylor and Francis, PubMD, Frontiers in Psychology. Mostly peer reviewed articles were selected.
2. The keywords used in resourcing the articles were “Music performance anxiety” OR “performance anxiety” OR “singing anxiety” OR “singing performance anxiety” OR “singing apprehension” OR “Music performance anxiety in singers” OR “stage fright” OR “fear of singing”.
2. Screening of titles, abstract and publication related to MPA alone was selected and duplicates were removed.
3. Screening by participants: Out of the selected articles, only articles which had singers in the sample were included. Studies with both participants from both instrumental musicians and singers were not excluded but a minimum cut off representation was used to include. Articles with participants of a minimum 10% singers in the sample were included. Articles with less than 10% of singers in the sample were excluded from this review.
4. The selection of articles were done by reading the abstract, the data collection method and participants information given in the study.
5. 16 articles were selected for analysis. The entire article was then read and relevant information like authors; methods used; participants information especially the number of singers; the number of male and female participants and key findings and outcomes were noted.
6. The data was then extracted from each study and classified into categories and presented in Appendix A.

Component 2: Project Report:

Understanding the instrument specific characteristics of MPA among singers

Music performance anxiety (MPA) is the fear or apprehension related to musical performance. The widely used definition of MPA offered by Kenny (2009, p12) is

“The experience of marked and persistent anxious apprehension related to musical performance that has arisen through specific anxiety-conditioning experiences and which is manifested through combinations of affective, cognitive, somatic and behavioural symptoms”.

This fear or anxiety is viewed by researchers either as beneficial or detrimental to performers depending on the levels of anxiety (Henshaw and Collyer, 2022), on how the performers perceive their symptoms (Titze, 2022) and the emotion that accompanies the performance (Murphy, McGillivray and MacIntyre, 2024). Fear is the natural response when singers view performance either as a danger or threat (Barefield, 2012). This can result in a ‘flight or fight’ response which is a heightened activation level which can inhibit the physical functioning of the body (Titze, 2022). This is not very helpful for singers. Due to this perceived danger, there are certain manifestations physically, behaviorally and psychologically. Physical symptoms like hyperventilation occur, which directly affects the respiratory functions and is related to negative feelings of MPA (Studer et al., 2011a). For singers these physical symptoms can affect the clear tone production (Henshaw and Collyer, 2022). It may also result in a compromised breath support causing the singer to take frequent breath leading to an inability to complete phrases as rehearsed before (Stothert, 2012).

MPA is positively correlated with various aspects like the trait anxiety of singers (Papageorgi, 2020). Although anxiety is common among musicians, it is reported to be more among instrumentalists than singers (Ryan and Andrews, 2009) and in solo performance contexts compared to ensemble settings. Hence the MPA may be lesser among singers who are in a choral setting as confirmed by a study (Ryan and Andrews, 2009) done with choristers revealing moderate levels of MPA among singers. MPA seems to be a common occurrence among singers across their developmental trajectory (Patston, 2013) although the level of its manifestations are different depending on various factors. The study participants of this review were from different nationalities, age group, gender, various levels of skills and

stages of life. However, MPA was observed across all spectrums irrespective of the above factors. This suggests the wider prevalence of MPA among singers and its universal presence among singers.

I shall now discuss the findings of this literature review of the characteristics of MPA in singers in relation to the research questions listed in component 1; the factors and manifestations of MPA and the role of gender in MPA with pedagogic learnings weaved into the discussion.

Discussion:

1. Factors influencing MPA:

The level of MPA arousal depends on the interaction of these three aspects: (1) *Individual characteristics* i.e.the trait anxiety (the proneness of an individual to get anxious) (2) *the degree of task mastery acquired* and (3) *the situation* (Burin and Osório, 2017). It is the interaction between these factors that will result in either enhanced or impaired performance (Kokotsaki and Davidson, 2003). Wiedemann et al. (2021) also affirm that the extent to which MPA may be advantageous or disadvantageous depends on the interplay of these three factors.

Table 1: Factors or causes for MPA mentioned in the articles in this review:

Person related factors	
Cognitive	Trait and state anxiety In his study with adolescent learners, Papageorgi (2020) found that almost 60% of the MPA variance was related to an individual's susceptibility to anxiety. The study suggested that both trait and state anxieties are correlated.
	Perfectionism - Perfectionism and MPA is shown to have a positive correlation. Perfectionism is related to the cognitive state of musicians and musicians having a high pursuit of perfectionism tend to have higher performance anxiety (Racine et al., 2025). Singers with perfectionistic preoccupations tend to have unrealistic higher personal standards, doubts about actions, higher concern over mistakes (Burin and Osório, 2017). Such singers will be highly self critical and over analyze every sound

	coming out of their mouth (Barefield, 2012). In this review, '<i>concern over mistakes</i>' was the most highly rated and recurrent category in the perfectionist tendencies in the studies that measured perfectionism. This result is similar to earlier findings by Frost et al. (1993) who reported that <i>concern over mistakes</i> had the most negative effect in the performance. For singers this may be detrimental as 'self preoccupied thoughts and worry' are the initial stages singers have before singers choke under pressure i.e. making a mistake in a performance (Oudejans et al., 2016). The role of a singing teacher is important in helping singers to set realistic goals and standards of singing based on one's abilities.
	External Focus of attention seems to be directly related to positive adaptive anxiety. This study shows that, singers whose focus of attention during a performance is inward oriented (negative anxious thoughts (Sokoli, Hildebrandt and Gomez, 2022), worry focussed on self or scrutiny of others, fear of evaluation (Sims and Ryan, 2023) had higher maladaptive MPA. This result is supported in the wider literature by Hörster and Hansen (2024) who reports that high internal attentional focus decreased technical precision in musicians whereas external attentional focus enhanced musical expression. Titze (2022) emphasizes that inward oriented foci i.e thoughts on oneself is most destructive whereas an external focus either <i>narrow</i> (focus on physical aspects of voicing, focus technical skills), <i>broad</i> (focus on the character of the song, on audience or on the goal of the performance) or <i>eternal</i> (spiritual focus i.e. the focus is on God and the performance is dedicated to Him) is good. Oudejans et al. (2016) validates it saying that singers often make a mistake during a performance when their focus of attention is not on the task at hand. A voice teacher working with singers struggling with performance anxiety can look for the direction and orientation of their focus of attention or signs of overly self centered thoughts. As a pedagogical tool, a negative inward oriented focus of attention can be used as a symptom for diagnosing the MPA in singers. Singing teachers on the other hand can include in their teaching curriculum specific aspects of performance training to equip singers to have an outward oriented external attentional focus.

	Perception of stage fright and performance self-efficacy - most performers perceived stage fright as a threat and its influence on their performance as negative (Studer et al., 2011). In addition students perceived the MPA symptoms more negatively than the professional musicians that aggravate their MPA (Paliaukiene et al., 2018). Papageorgi, Creech and Welch (2011) state that the perceived anxiety is proportional to the anxiety on performance. To mitigate this Titze (2022) suggests the need to view the performance through two different perceptions - cooperative and competitive. Having the right perception for each context will enable the singers to view the performance in a healthy way.
Behavioural	Over analyzing, although a trait of perfectionism, is a behavioral manifestation of MPA (Cupido, 2018). This again is related to inward oriented self focussed attention. To break this cycle, singers should change their focus immediately to an external one (Titze, 2022). Hyper scanning, commonly present among social phobics, was also present among singers who had extreme levels of performance anxiety (Dobos, Piko and Kenny, 2018) and social phobia had a significant correlation to MPA. People with social anxiety tend to be more sensitive to emotional states and facial expressions of others (i.e audience). Hence they will tend to avoid such events. Avoidance is another predictor for MPA which is also considered to be one of the symptoms of social phobia (SP). Papageorgi, Creech and Welch (2011) state that debilitating performance anxiety has similar features as that of the symptoms of SP such as fear of scrutiny and negative evaluation, reactions of important others and fear of crowds. Dobos, Piko and Kenny (2018) state that social phobia (SP) and perfectionism have significant correlation with MPA. Moreover Papageorgi (2020) has reported young musicians with high MPA in cypriot had dropped out of music lessons which confirms the avoidance tendencies. Paliaukiene et al. (2018) also has reported that participants in that study with high MPA tended to avoid concert activities. Although it requires more exploration to understand whether this avoidance comes because of social phobia or due to MPA, for a singing teacher 'avoidance' would be a clue or a predictor to identify MPA in student singers.

	Organisation skills was found to be a negative predictor of MPA (Dobos, Piko and Kenny, 2018) even though it is an aspect of perfectionism. An organised person is able to concentrate or focus his/her arousal toward task specific information and builds confidence and self efficacy. Both focus of attention (Hohagen and Immerz, 2024) and self efficacy of performers are negatively related to MPA (Zelenak, 2024). Hence I think organizations skills increase the self efficacy and focus of the performers thereby helping the performance.
Affective factor	Fear of failure, worry about actions and fear of evaluation are found prevalent among singers which tends to escalate depending on the audience present and the exposure of scrutiny (Sims and Ryan, 2023). O'Bryan (2015) states that singing is an expressive human activity and for singers there is a deep connection between their voice's expressive capacity and their sense of self. Kenny (2009) also remarks that a musician's self identity and self esteem is so entangled with their musical self efficacy. While signing, singers feel like exposing their inner being (Henshaw and Collyer, 2022). Because of this they think if they fail to perform well then they failed as musicians which makes them more vulnerable to anxiety. Hence they fear failure and are overly concerned over their mistake as they don't want to be seen as inferior (Cupido, 2018).
Other Factors	
Demographics	Age and experience MPA was prevalent among singers of all age categories. The studies reviewed here represent singers between ages 9 to 70 and all studies report MPA denoting its wider prevalence. However, the degree to which it is prevalent depends on the age of onset of musical learning and musical performance; training and years of performing experience. Singers who start to perform later in years had more MPA (Sims and Ryan, 2023) and Sokoli, Hildebrandt and Gomez (2022) mentions the years of performance of experience have a negative relationship with MPA. This confirms earlier study by Ryan and Andrews (2009) who has reported that trained singers had less frequent and less severe anxiety. However there are other studies (Barbar, Crippa and Osório, 2014; Kenny, Davis and Oates, 2004; Kokotsaki and Davidson, 2003; Patston and Osborne, 2016) with

	contrasting results indicating a positive correlation between professionalism and MPA. Although these are contrary results, the fact that they are professionals and have been in the professional field without quitting is an indication that they have learned to wield their anxiety in an adaptive way. This was observed by Irie, Morijiri and Yoshie (2023) in his study where professionals viewed their MPA symptoms as natural and unharmed responses and not debilitating to their performance.
Situational factors	
Audience	Performance in front of a jury/ exam (Sulun, Nalbantoglu and Oztug, 2017), peers or gifted musicians (Cupido, 2018) was stressful for singers.
Occupational stress	Opera singers, who had high MPA levels, reported that the pursuit of tenure, erratic work schedules and role ambiguity added to the anxiety (Kenny, Davis and Oates, 2004)
Physical work space	Singers reported that the dust, temperature (Kenny, Davis and Oates, 2004) and noise levels (Silva et al., 2024) sometimes added to their anxiety. When working conditions are not very conducive and hygienic, it may affect the health of singers. Since singers rely on their physical health to be able to perform well any of these factors may add to their stress. Considering the fact that Delhi is one of the most populated and polluted cities in the world (Dutta and Jinsart, 2022), dust is an important contributing factor for throat related problems in Indians, especially for singers, singing teachers and other voice users whose livelihood depends on their voice. Singers are dependent on their respiratory function and are known to have larger lung capacity than the general population (Roy and Bandyopadhyay, 2015). Since air pollution affects the pulmonary lung capacity, it would be good to be mindful of the effect of dust and pollution on the lung capacity of Indian singers and the performance anxiety associated with it.
Learning environment	Online learning environment was reported to be more anxiety inducing than the in-person environment (Ryan, Andrews and Tsang, 2024) the reasons being instrumental experience due to technical issues, feeling exposed and concern over mistakes. These symptoms were also

	discussed in an earlier study by Leiper (2021) which reported the choral singers experienced feelings of loneliness, being exposed and technological frustrations. The most mentioned conductor characteristic feature by choir singers was anxiety (Ryan and Andrews, 2009). This lays an importance on educators and voice teachers to create a safe space for learners in the studio and create relational trust with the student singers (Stothert, 2012).
Societal factors	Nationality & Cultural Expectations - the prevalence of performance anxiety among singers was different in different countries. In a comparative study of MPA in adolescent learners from Cypriot and Britain, Papageorgi (2020) reports higher anxiety levels in Cypriot students that decreased over time while the anxiety levels in British learners increased gradually. This is an indicator of cultural influence on different developmental trajectories in these groups. Barbar, Crippa and Osório (2014) also points out the cultural association with performance anxiety among singers in European and Latin countries. Being in the Indian context, training voice students in western music performance would involve several cultural factors that might induce anxiety among vocal students. Career uncertainty, lack of structured music programs, lack of music universities for certification in India (Kelman, 2023) and pathways for professional growth and high cost of music education in India (Avis, 2020) could be some of the factors that might cause anxiety and add pressure to Indian singers to do extremely well and strive for excellence. For a singing teacher in an Indian context it requires one to be more mindful of these societal pressures that can influence student singers suffering with MPA. Parental expectations did not contribute to adverse effects of MPA. Instead parental expectation gave motivation to the performers and did not lead to MPA (Dobos, Piko and Kenny, 2018). This study was done with Hungarian music students. However, a recent study (Menon, V. R. and Rajan, 2024) done among Indian adults to understand the relationship between parental expectations, fear of negative evaluation and maladaptive perfectionism showed that there exists a positive correlation. Since perfectionism and MPA are positively related (Cupido, 2018), I

	wonder how parental expectation would influence Indian singers. Hence it would be worth studying the influence of parental expectation on MPA through a non-western lens as Asian cultures value family recognition through achievement (Menon, V. R. and Rajan, 2024).
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2. Manifestations of MPA in singers:

Addressing my research question 2, the **MPA manifestations** are categorized broadly into these domains: physiological, behavioural, cognitive and affective (Kenny, 2011). **Physical** manifestations of MPA if uncontrolled can be detrimental to singers as the act of singing requires very nuanced muscular and mental coordination (Henshaw and Collyer, 2022).

Some of the noted physical manifestations in singers have been

1. *Hyperventilation* which results in difficulty breathing Studer et al., 2011);
2. *Cold hands; increased muscle tonus* causing stiffness and tension in muscles around larynx or *decreased muscle tonus* resulting in floppiness, lacking control over the voice (Berghs, 2008);
3. *Muscle stiffness* (Paliaukiene et al., 2018),
4. *Breathing, mouth and throat related complaints* (Sokoli, Hildebrandt and Gomez, 2022)
5. *Increased heart rate, perspiration and gastrointestinal disturbances* (Irie, Morijiri and Yoshie, 2023).

Singing is a physical activity, physical arousal can directly affect the functioning of the physical functioning of voice which can be detrimental to a singer. Although these symptoms present in milder levels can be used to boost the adrenaline levels and provide the extra energy needed for the performance. In that case the MPA arousal is facilitating the performance Hunnicut and Winter (2011b). As physical symptoms are quite visible a singing teacher can use these symptoms to identify MPA in singers and help them accordingly Patston (2013).

Behavioural manifestations of MPA observed among singers are

1. *Avoidance of concerts* or classes (Paliaukiene et al., 2018)
2. *Tremor and muscle stiffness* (Irie, Morijiri and Yoshie, 2023)

3. *Over analysis singing* (Cupido, 2018) and
4. *Hyperscanning* (Dobos, Piko and Kenny, 2018) the tendency of being over sensitive to other people's behaviour and expressions.

Manifestations of MPA at a **cognitive** level observed in singers are

1. *Disturbing thoughts, lack of focus of attention* on physical aspects, lesser thoughts that give confidence and lack of focus on music related information (Oudejans et al., 2016)
2. *Low perception of self efficacy* (Paliaukiene et al., 2018)
3. *Memory slips* (Irie, Morijiri and Yoshie, 2023)
4. *Negative thoughts* (Sokoli, Hildebrandt and Gomez, 2022).

Some of the **affective** symptoms of MPA in singers are fear of negative evaluation (Sims and Ryan, 2023), a *desire for perfectionism*, worry about others opinion (Irie, Morijiri and Yoshie, 2023), and *desire for approval* (Cupido, 2018). It is interesting to observe that these results are coherent with the symptoms reported in other MPA reviews (Barros et al., 2022; Burin and Osório, 2017) done with general music populations.

However there are few manifestations which are observed only by singers which are instrument specific. Firstly, singers along with wind players tend to have more complaints related to breath, mouth and throat compared to other instruments while hand and arm related complaints were more among the instrumental musicians (Sokoli, Hildebrandt and Gomez, 2022). Similarly Studer et al. (2011) reports that singers and wind players seem to report significantly higher respiratory symptoms than other musicians. The similarity of these physiological symptoms shared between singers and wind players is interesting. It might be due to their focus on the body parts (breath and mouth) that are important for their instrument. From a pedagogical stance, a singing teacher could bring awareness to singing students about these symptoms and incorporate teaching healthy breathing techniques in addition to vocal health education for the singers to take care of their voices as a part of their performance training.

Secondly, when compared to other musicians, the levels of MPA in singers seem to be much lower than other instrumental players. Sokoli, Hildebrandt and Gomez (2022) reports that singers had less anxious feelings and catastrophic thoughts compared to the instrumental players. This confirms the results of an earlier study by Studer et al., (2011) who reports that the experience of stage fright as a problem was not stronger in singers compared to other musicians. A possible reason for the lower score in singers could be their reliance on their

internal instruments as opposed to the external one for instrumentalists (Sokoli, Hildebrandt and Gomez, 2022).

This doesn't mean that singers do not experience negative feelings of MPA. Three studies (Kokotsaki and Davidson, 2003; Ryan and Andrews, 2009; Silva et al., 2024) that were conducted solely with singers indicate and affirm the prevalence of MPA in singers but indicate that it was present only at moderate or lower levels. Ryan and Andrews (2009) too reported that MPA is a common experience among singers and that many singers in his study only experienced moderate levels MPA which is not debilitating. It is worthy to note that the population of singers in these studies were not professionals but were amateur singers (Silva et al., 2024), conservatory singing students (Kokotsaki and Davidson, 2003) and semi professional choral singers (Ryan and Andrews, 2009).

Contrastingly another study (Kenny, Davis and Oates, 2004) whose participants also were fully singers reported higher levels of trait anxiety (3 times more) than the normative sample. Since trait anxiety is positively related to MPA (Barros et al., 2022) it could be said that these singers experienced higher levels of MPA. This contrast in results could be due to the occupational stress considering that these singers were elite, professional opera singers whose career is dependent on their voice. These singers, being professionals, might be under pressure to constantly be in good vocal condition amidst their work stress and the uncertainty involved in the advancement of their career (Kenny, Davis and Oates, 2004). Also, since MPA levels and perfectionism are related to years of performing experience (Patston and Osborne, 2016), one could reason that singers who are gifted tended to have higher personal standards leading to higher anxiety levels in their performance. This was also reported by Cupido (2018) in a study with four assistant singing professors. For a voice teacher in a singing studio this might provide an insight of the need to understand the background and the career goals of each singing student and accordingly give appropriate performance training. It can be supposed that those students who want to pursue singing as a career or those who are already working as singers or singing teachers, are susceptible to higher MPA levels.

Solo versus group - singers' level of MPA was much lower than other musicians both in solo and group context. Ryan and Andrews (2009) who studied MPA among choral singers reports that anxiety was generally higher for musicians than singers and also more in an ensemble than in solo performance for both in voice and instruments. This is also reported by Papageorgi, Creech and Welch (2011) whose findings confirm that solo performance tends to evoke higher MPA among musicians. Putting together these two aspects and

looking at it through a pedagogic lens, for mitigating MPA, I suggest that introducing a singer to sing in a choral group will be a good starting place for music performance training. As the above studies indicate, singing in a choral group may help in relieving performance pressure and train them to focus their MPA arousal toward facilitating the performance.

Dual roles of Voice teacher

Both Henshaw and Collyer (2022) and Patston (2013) emphasize the importance of identifying performance anxiety in students and how music teachers are responsible in offering performance training to singers. Also, due to the intimate nature of the one-to-one studio setting which builds rapport and trust built between the student singers and the voice teacher over the many singing lessons, students may prefer help from a voice teacher than a psychotherapist (Mahony, Juncos and Winter, 2022) and hence a voice teacher may play dual roles as both a teacher and a MPA practitioner. Hence it is important for singing teachers to know their professional limitations and not overstep the boundaries as singing teachers are not required to play the role of counsellors or to do a clinical diagnosis (Hunnicut and Winter, 2011b). However it would benefit singing teachers to receive training in managing MPA related coaching.

3. Gender and MPA

Although several of the above studies indicated a strong correlation between female gender and MPA, not all studies had similar consensus. The study outcomes of the relationship between MPA and female singers are given in Appendix B. Most of the studies in the review indicated that females have a greater tendency to be more anxious irrespective of their age except for the two studies (Barbar, Crippa and Osório, 2014; Paliaukiene et al., 2018) which reported no significant difference between the genders. However in the majority of studies there seems to be a significant correlation between MPA and gender. This result is similar to the results observed in other reviews like Barros et al., (2022) where females were reported to have higher tendency toward MPA.

As a voice teacher, I find these results very insightful as it informs me of the list of underlying issues that may contribute to performance anxiety across gender especially among female singers. The reason for this study is to understand the trend of MPA among the genders and not to find or establish the causal relationship of MPA among females. From a pedagogic point of view, these findings also inform me that as a practitioner I must be more attuned to the various issues that female singers could have and be mindful in understanding them and

to offer them more focussed help and support. While seeking to understand and help female singers, a singing teacher may use the visible behavioural and physical symptoms (like avoidance to performance and classes, excessive sweating or drinking water, negative talk, etc.) expressed by the female singers as indicators of anxiety. Since behavioural symptoms have strong underlying connections with cognitive and affective states, those behavioural symptoms could be used as a starting point to initiate conversation with singing students about MPA.

Since performance anxiety is also culture dependent (Papageorgi, 2020), personally being aware of my own Indian context and how it may impact female singers in India is worth the study. Coşkun-Şentürk and Çırakoğlu (2017) have highlighted that women growing up in restrictive societies with gender-based discrimination practices are likely to experience more shame which can increase negative feelings of MPA. I suppose that in the Indian context, the anxiety faced by female singers may be unique due to the prevalent conservative patriarchal societal structure (Bhatnagar, 2024), gender stereotyping and gender segregation (Nair, 2010). Also one has to consider the guru-shishya model prevalent in Indian classical musical training in India, which tends to instil fear and foster a power imbalance between the teacher-student relationship (Ranganathan, 2024). A female student vocalist with a hindustani musical learning background may carry that baggage into the voice studio while learning western singing. This calls for an extra careful measure from the singing teachers to break those perceptions by creating a non- judgemental learning environment (Barefield, 2012) which is safe for female singers. As a practitioner, this is an important learning for me. one needs to employ mindfulness of the learner's background, offer compassion and understanding for such singers and a safe learning space.

Limitations and future recommendations:

1. Hence the heterogeneity in these studies like the sample size, age, population, data collection instruments and analytical approaches are quite diverse. The study instruments (questionnaires) used to measure the data in these articles were quite varied, although K-MPAI (n=6) and STAI (n=5) have been employed in many studies. This heterogeneity makes it difficult to compare the results within the studies. Also most of these questionnaires used were generic and not instrument specific. Hence it would be useful to have a questionnaire specific to singing or instrument specific to better understand the instrument related MPA.
2. However in all these studies there is no clear universally accepted cut-off value set for the MPA levels. Different studies (Paliaukiene et al., 2018; Sims and Ryan, 2023)

have used different threshold values. This is a limitation as the cut off threshold was quite different for each population. Having a clear specific cutoff value will help in comparing the results between the studies.

3. Most of these studies, except one, were cross-sectional studies. Hence it is very difficult to understand the developmental trajectories. Longitudinal studies will help in understanding the casualty and to understand changes in MPA with time.
4. Since females are more prone to performance anxiety, longitudinal studies to understand MPA in females will help in understanding the developmental trajectory in females. Also it is worth understanding the experience of and the contributing factors for MPA among females in different cultures and countries. This will aid in culture specific MPA characteristics in females and offer culture oriented intervention.

Critical Reflection:

For this reflective writing, I have chosen Gibbs reflective model. It is a repetitive model of reflection which is similar in nature to the hermeneutics methodology chosen by me to uncover meanings in my chosen topic. The 6 stages of Gibbs cycle are

1. Description
2. Feelings
3. Evaluation
4. Analysis
5. Conclusion
6. Action plan

Agee (2009) says the researchers often start thinking about the study long before their first research question is drafted. That was certainly true in my case. My interest in MPA was triggered by my experiences in my teaching practice. Being a voice teacher I have always wanted to help singers sing without fear as I believe that singing should be a joyful activity. My interest in the study of MPA in signers happened due to my interactions with two female singing students in my voice studio who were facing debilitating forms of MPA and wanted to quit. It made me sad to see them gripped by fear. As a practitioner who reflects in action (Finlay, 2008), I quickly realised that their issues were not just 'technical' but more psychological. Hence I chose the topic of music performance anxiety, so that I can identify the various MPA characteristics in singers and will help them sing with joy and not with fear (Perdomo-Guevara and Dibben, 2024).

The subject of Music performance anxiety was so vast and I was not sure how to go about it. So during my initial readings, as MPA was a totally new subject, I turned attention to reading literature reviews on MPA to get an overview of the subject as they were credible and peer reviewed (Eaton, 2018). Reviews by Barros et al. (2022) and Burin and Osório (2017) were very helpful initially. However, these articles were about the general population of musicians and were not specifically about the MPA in singers. Hence I modified my search to suit my research questions to include studies that addressed MPA in singers, its manifestations and interventions. There were a plethora of articles on the intervention of MPA in singers. Due to the time frame and since I wanted to first understand the manifested characteristics of MPA in singers, I chose not to pursue studying the interventions of MPA but limit it to study only the characteristics.

Due to my chosen methodology of hermeneutic phenomenology, I decided to choose cross sectional or longitudinal studies on the manifestations and interventions for MPA in singers. Hermeneutics seeks to understand the text within its wider context (Boell and Cecez-Kecmanovic, 2010) while phenomenology seeks to understand the lived experiences of a phenomena under study which happens through interpreting texts or interviews collected during data collection (Lavery, 2003). By combining both hermeneutics and phenomenology, I was able to study the lived experiences of singers having MPA by treating each article chosen for study as a text or a part of the whole or the wider context which is MPA in singers. Hermeneutic phenomenology also requires that participants (parts) of the study should possess real experiences and intimate knowledge of the phenomena being studied (Ramsook, 2018). Also Randolph (2009) states that when using phenomenological framework as a review tool, it allows researchers to consider the reports of the included studies as a method of collecting data. Hence purposefully selecting the cross sectional studies during the data gathering process aligned itself with the hermeneutic phenomenological framework.

However, this exposes my bias as an insider researcher to collect data only from text or articles that had participants (singers) who had real life experiences of MPA. Upon reflection I think that, as a practitioner-researcher, my research questions arose out of the 'swampy lowlands' of practice as Winter (2020) states and are part of the research experience. Scott (2022) also affirmed it saying that insider researchers are inside the research experience and prone to subjectivity. However to avoid this bias, Saidin (2016) recommends that practitioner-researchers must also be analysed along with their ontological and axiological position. In addition, Merton (1972) mentions that one needs to take into account the 'foci of interest' for an insider researcher as compared to an outsider researcher. As an insider, my

focus of interest was to understand the phenomena as experienced by this sample population i.e singers and not to find out the 'objective truth' behind the phenomena.

The most useful article was by Cupido (2018), a qualitative study done among singer-singing teachers. This article introduced me to other singer specific MPA articles but still such articles were very less in number (n=5). In order to understand more, I changed my inclusion criteria to include studies that had a minimum of 10% singers in their participant sample. By this I was able to gain more singing specific MPA information. Such alteration or reflection-in-action in the search strategy is part of the dynamic and ongoing research process.

At the beginning of this module, I had set clear time frames to conduct the different stages of this study. However, unexpected life issues happened that brought my research to a halt for almost two months. When I started again, I felt overwhelmed by the enormity of the work and doubted if I would be able to complete it. These were anxious feelings and it was then I noticed that I was experiencing similar symptoms of performance anxiety (Herman and Clark, 2023) about which I was studying. These kinds of lonely feelings and self doubt are common for an adult-practitioner-researcher as mentioned by Scott (2022). It was a self revelatory journey for me. But talking to the tutor and admin was helpful and gave me confidence to pursue.

My own study involved a lot of questioning, reading and reflection, leading to new understandings, which further led to a continuous dialogue with the text prompting more reading and understanding. This resembles the hermeneutical circle in which 'meanings occur through a circle of readings, reflective writing and interpretations' (Laverty, 2003, p2) and understanding of the meaning of each individual part lead to the understanding of the entire body of literature (Coşkun-Şentürk and Çırakoğlu, 2017). Considering the topic of MPA in singers as a whole body of literature, each chosen article in this study gave me an information that is a part of the whole which led me go back and forth in a iterative hermeneutic circle, which increased my depth of engagement and the horizons of my understanding of each text in relation to the wider topic.

I set out this study to learn the instrument specific (singing) characteristics of MPA as whenever I studied an article on MPA I questioned whether the study outcomes would be true for a singing population. However, through this paper, I have found that much of the characteristics present among singers were similar to musicians. The differences noted are that singers experience less anxiety compared to musicians (Ryan and Andrews, 2009; Silva

et al., 2024; Studer et al., 2011) and bodily complaints related to breath, mouth and throat are specific to singers (Sokoli, Hildebrandt and Gomez, 2022; Studer et al., 2011). So this answered my first research question that there are some characteristics of MPA that are specific to singers especially the physical symptoms.

Among the singing population, female gender had more tendency to anxiety (refer table 2 of component 2). Patston (2013) emphasises the responsibility the music educators have in training the students in lessons, practice and performance. Hence considering the majority of female student population in my studio there is a need for me to be more alert of the physical and behavioural MPA patterns of female students and help them accordingly. Overall this study has filled my knowledge gap and has equipped me to better serve the singing community.

Conclusion:

This study affirms that there exists instrument specific MPA characteristics although not many. Some of the specific physiological MPA manifestations observed among singers are respiratory and breath, mouth and throat related problems. The MPA arousal among singers are mostly lesser compared to other instruments indicating that singing might be one of the less anxiety inducing art forms. The role of teacher or choral conductor or a singing teacher in the singing studio is crucial who will be shaping the formative experiences of singers. They need to create a safe learning environment that can be used to build the singers. As a practitioner researcher who is striving toward better teaching practice, this paper has enabled me to understand the effects of MPA in singers especially in females and has encouraged me to be a compassionate voice teacher offering a valuable source of support to my students.

Appendix A:

Studies represented in this review

Authors	Participants	Number of female participants	Nationality	Age	Study Instruments	Outcomes of the study
Kokotsaki and Davidson (2003)	Total 43 participants	Male = 14 Female = 29	London, UK	Not mentioned	For the testing of the participants' anxiety, Spielberger's State-Trait Anxiety Inventory (STAI). The inventory consisted of two forms each consisting of 20 self-report items. 1. The State-Anxiety Inventory (Form Y-1) (evaluated how respondents generally feel) 2. The Trait-Anxiety Inventory (Form Y-2) (evaluate how respondents feel right now, at this moment)	1. Females are more anxious in both as a personality trait and state condition of a jury situation. 2. There is a proportional relationship between trait and state anxieties. 3. State anxiety is proportional to trait anxiety and vice versa. 4. Advanced musicians, who have more training and performance experience performed better and also benefit from their higher levels of pre-performance anxiety.
Kenny, Davis and Oates (2004)	32 opera choir singers	Total participants = 32 males = 11 females = 21 (65.6%)	Australia	Age range - 28 to 61	1. Spielberger State-Trait Anxiety Inventory (STAI-S; STAI-T; Spielberger, 1983) consists of two 20-item self-report questionnaires assessing state anxiety (i.e., feelings of apprehension, tension, nervousness, and worry) and trait anxiety (which measures stable differences in anxiety-proneness). 2. Cox and Kenardy MPA Scale (CK-MPA). The original scale was modified for this study to include separate scales for solo (CK-MPAS) and choral (CK-MPAC) performance. 3. Occupational Stress Inventory—Revised (OSI-R)) scale measures three aspects of occupational functioning: Occupational stress, psychological strain and coping resources. 4. A new scale, the Kenny Music Performance Anxiety Inventory (K-MPAI) 5. Frost Perfectionism Scale (FROST-PE) this multidimensional measure was included to determine whether perfectionism was related to anxiety or	The opera chorus artists report higher trait anxiety, higher occupational role concerns and higher occupational personal strain than the normative samples. Other findings are: 1. Occupational stress may not make an additional contribution to MPA 2. Choral singers who demonstrated higher personal resources (engaging in regular exercise, sufficient sleep, proper diet, avoiding alcohol and drugs, practicing relaxation techniques) scored high in trait anxiety. Maybe they used their personal resources in an adaptive way to cope with anxiety. 3. Perfectionism was associated with anxiety, MPA and use of personal resources in this sample. Those higher in perfectionism tended to engage in fewer enjoyable recreational activities.

					occupational stress in elite singers.	
Ryan and Andrews (2009)	201 semi professional choral singers	82% females 164 females	Canada	age from 17 to 70; average age of 40.	Questionnaire - open ended and closed questions. Anxiety was measured in four contexts: choral and solo vocal performance (where applicable) and, for those with instrumental experience, solo and ensemble instrumental performance	1. Anxiety was more in solo compared to ensemble both in voice and instruments. Musicians are much more exposed and mistakes are more easily noted when one is performing alone. 2. Anxiety was more in instrumental music than in singing in both solo and ensemble. Another possibility is the reliance on an external instrument as opposed to one that is internal to the musician. Perhaps, singers feel a greater sense of control over their instrument and therefore respond with less anxiety. 3. Trained singers experienced less frequent and less severe anxiety. Another explanation could be that those who have a great deal of performing experience have learned to focus their arousal toward facilitating their performances, in which case the anxiety is likely to be perceived in a more positive light. 4. The most frequently reported conductor characteristic was anxiety 5. The most common coping mechanisms used by singers are meditation, exercise, prayer, deep breathing, yoga, self-help books, visualizing, extra practice, quiet time before performing.
Studer et al. (2011)	169 classical music students 23 vocalist - 14% participants	61% females - 103 females 66 Males	Switzerland's French-speaking music universities	age range 15 to 45 years old, with a mean of 24.3 years	Hyperventilation complaints were assessed with the Nijmegen Questionnaire (NQ). A threshold of 22–23 points out of 64, was used to separate hyperventilators from non-hyperventilators. State-Trait Anxiety Inventory - STAI was used to measure negative feelings of MPA.	1. Wind musicians/singers reported a significantly higher frequency of respiratory symptoms than other musicians. STAI-S score was lower for singers and wind musicians compared to that of other musicians 2. Significant positive correlation between hyperventilation complaints and negative feelings of MPA before performance 3. Significant positive correlation between hyperventilation complaints and the experience of stage fright as a problem. Stage fright may thus be perceived as a problem through the disruptive effects of physiological symptoms. Therefore, the experience of stage fright as a problem may rather be the consequence of hyperventilation complaints than their cause. 4. Women scored significantly higher on hyperventilation complaints and negative feelings of MPA.

(Barbar, Crippa and Osório, 2014)	singing as their main instrument (41.6%)	96 male 134 females	Brazil	Mean age - 39.17	1. Kenny music performance anxiety inventory (K-MPAI): 2. Social phobia inventory (SPIN) 3. Beck anxiety inventory (BAI) 4. Self statements during public performance (SSPS-D): 5. Patient health questionnaire 6. Identification questionnaire	1. 13% of participants had pathological indicators of moderate or severe general anxiety; 19% of social anxiety and 20% of depression 2. No statistically significant differences were found in relation to gender, however the scores of women were always slightly higher than those of men. The only exception refers to the avoidance subscale of the SPIN, in which women had higher scores. 3. Musicians with MPA also have more indicators of general anxiety, social anxiety, depression, and negative cognitions, which shows the high rates of comorbidity between MPA and other psychiatric/psychological conditions. 4. Musicians with MPA indicators had more negative cognitions. 5. The professional relationship with music seems to be associated with increased symptoms of general anxiety, depression, and mainly social anxiety compared to amateur musicians.
Patston and Osborne (2016)	526 students 13.4% of singing students	291 males 235 females	Australia	Age between 9 to 17 mean age of the sample was 12.56 years	Two questionnaires, 1. The Music Performance Anxiety Inventory for Adolescents (MPAI-A; Osborne & Kenny, 2005) - measures somatic, cognitive and behavioural components of MPA 2. Child Multidimensional Perfectionism Scale (C-MPS; DeKryger, 2005) - measures the multidimensional components of perfectionism in children, such as Concern over Mistakes, Organisation, Parental Expectations And Doubts about Actions, goal orientation, performance evaluation, maladaptive striving	1. The correlation between MPA and perfectionism by age showed a consistently strong, positive and highly significant relationship from 10 through to 17 years of age, particularly for Concern over Mistakes. 2. The second significant relationship between MPA and perfectionism applied to gender, with females experiencing a steeper and more intense developmental trajectory than males. 3. The third important finding of the research was that levels of MPA and perfectionism increase with years of experience. The increase in perfectionism scores with more years of learning was significant.

Oudejans et al. (2016)	Study 1 - 81 participants Vocals - 8 - 10% singers Study 2 - 29 participants Vocals - 5 - 17.24% singers	Study 2 - 29 participants 11 male; 18 females	27 different nationalities	Mean age Study 1 - 23.5 years Study 2 - 24.2 years	Retrospective verbal report method Study 1: Two questions were asked: (a) At these stressful moments, where does your focus of attention go? (b) Can you explain in a few sentences where you call your attention to and/or what you think about? Two additional questions were asked: (a) Is your attention always focused on the same thing or does it differ in accordance to the specific situation? (b) Can you briefly explain your answer? Study 2: To complete a verbal report form - Verbal report Choking and Verbal report Recovery	1. For musicians while performing under pressure before choking, "focus on physical aspects (16.2% for students vs. 20.5% for elites), narrow focus (3.5% vs. 3.7%) and other (9.1% vs. 5.3%). However students had higher disturbing thoughts (26.1%) and worry that elite musicians (5.8%) and lower in thoughts that gave confidence ((8.3% for students) compared elite musicians (16.8%). 2. Just before making a mistake due to pressure, 50% of the focus of attention was on worries and disturbing thoughts especially for women. This indicates a loss of focus on task relevant issues. 3. When choking under pressure occurs (e.g., a mistake is made) the student's focus of attention turns to music-relevant information as comparable to elite musicians.
Sulun, Nalbantoğlu and Öztug (2017)	Total 59 participants	Male = 32 Female = 27	Cypriot	varied age levels	Instrument Performance Anxiety Scale conducted in face-to-face interviews.	1. Instrument performance anxiety of the students in performance lessons was high. 2. With respect to differences in gender, it was found that the level of anxiety in females is higher than that of males. 3. It was observed the highest level of performance anxiety was amongst second year students, while the lowest level of performance anxiety was amongst first year students. 4. Students with academic music education (music high school graduates) have lower performance anxiety levels. It can be said that previous experience and readiness of the students decreased the levels of anxiety. 5. The performance anxiety levels of the students who thought that they were not prepared for the examinations were significantly higher than the students who thought they were prepared. 6. Although the students indicated that their academic achievement had worsened as a result of frequent tests, it was found that the grade average amongst students had increased.
Cupido (2018)	4 singing teachers	3 Male 1 Female		Adults	Semi structured interview and open ended questions	The themes discovered are: I. Pressure on self: The pursuit of tenure; vocal insecurities; Achievement and success. II. Personal standards: a. Role model b. Paralysis through analysis - tendency to over analyse c. Expectation and criticism from colleagues - III. Concern over mistakes in front of students and colleagues in performance and teaching;

						a. Fear of failure b. Vocal Demonstration - some experienced MPA while demonstrating to their students especially with an unusually gifted student. b. Seeking approval, reassurance and acceptance from colleagues and students
Dobos, Piko and Kenny (2018)	(N = 100;) 13% vocals all musicians from Hungary early career (graduate) musicians and music students	N = 100; 38% males 62% females,	Hungary	Age between 15–35 years	1. <i>Kenny Music Performance Anxiety Inventory (K-MPAI)</i> - to assess the emotion-based theory of anxiety 2. <i>Frost Multidimensional Perfectionism Scale (FMPS)</i>: to measure six dimensions of perfectionism: <i>Concern over Mistakes (CM), Doubts about Actions (DA), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), and Organization (O).</i> 3. <i>Social Phobia Inventory (SPIN)</i> - This 17-item self-report inventory evaluates the full spectrum of symptoms of non-specific social phobia including fear, avoidance, and physiological symptoms. A cut-off score of 20 was used to distinguish the social phobia subjects from the non- social phobia controls	1. Females are more likely to develop anxiety disorders and report more MPA than male musicians 2. Gender differences were also found for social phobia: females had significantly higher scores on social phobia (SPIN) than males. 3. Although no significant gender differences were found for the total score of perfectionism (FMPS), females scored higher on the subscale of Concern over Mistakes (CM). 4. Social phobia and perfectionism were significantly correlated with MPA. 5. Parental Criticism and Doubts about Actions had positive correlation with MPA, while Parental Expectations and Preference for Organization were negative predictors. 6. The study suggests strong interrelationship among MPA, social anxiety, and perfectionism and that in some cases of MPA there may also be comorbid, non-performance related social phobia.
Paliaukiene et al. (2018)	258 participants, Lithuania singing = 37 = 14.3% singers mostly solo performers (n = 197; 59.4% female)	90 males 168 females	Lithuania	Age range - 18 to 54 years	The Kenny Music Performance Anxiety Inventory (K-MPAI) was used for assessment of MPA. The K-MPAI items include 1. proximal performance concerns 2. context of early interactions 3. psychological vulnerability. Cut-off used was 130 out of 240 for the total K-MPAI score to identify students with a high MPA in our sample. Participants with a score of ≥ 130 on the K-MPAI were assigned to a high MPA group, and the rest of the sample was assigned to a low and medium MPA group.	1. High MPA was associated with less concert activity, poorer perceived performance self-efficacy, and lower academic achievement grades. Poorer performance self-efficacy and presumably avoidance of concert activities is associated with a high MPA based on our study results. 2. Gender was not associated with high MPA. 3. High MPA was not linked to the year of study 4. No statistically significant association between high MPA and solo vs. group performing. 5. Students in professional music performance training can cope with MPA quite well, where half of the students with high MPA were able to cope well and the other half found it difficult to cope.

Papageorgi (2020)	410 participants	58% girls	Cypriot, British	Age 12 to 19 years	1. Young Musicians' Performance Questionnaire 2. Adolescent Musicians' Performance Anxiety Scale (AMPAS) They included Negative outcome expectancies (2 items) Negative experiences in performance (5 items) Evidence of pre-evaluation anxiety (3 items) Experience of physiological symptoms of anxiety (4 items), Concern about others' judgments (2 items) Negative perception of anxiety (4 items).	MPA is predicted by: 1. Individual characteristics affecting susceptibility to anxiety: Nationality (Cypriot), age group (younger), perception of high levels of anxiety, perception of parents being critical, low self-concept in music and perfectionistic (Cognitive factor) tendencies—associated with higher levels of MPA (b) Task-efficacy related variables: Low perceived self-efficacy level—associated with higher MPA (c) Performance environment related variables: Sensitivity to audience presence and to the degree of self-exposure, and uncomfortable performance environment—associated with higher MPA.
(Sokoli, Hildebrandt and Gomez, 2022)	186 classical music university students 13% singers	75 male and 111 female classical music university students	Switzerland	Aged 15–45 years	1. State-Trait Anxiety Inventory STAI (Spielberger, 1983) for measuring anxious feelings 2. Bodily complaints were measured using the Nijmegen Questionnaire (NQ) three sub-categories of bodily complaints: breathing-related complaints (five items), mouth- and throat-related complaints (four items), and hand- and arm-related complaints (five items). 3. Performance Anxiety Questionnaire (Cox and Kenardy, 1993)	1. Age was positively associated with anxious feelings and bodily complaints. 2. Compared to male students, female students reported significantly more anxious feelings and catastrophizing. 3. A higher number of solo performances tended to be associated with less anxious feelings. 4. More years of instrument study was significantly associated with lower levels of anxious feelings. 5. Singers reported less anxious feelings and catastrophizing than instrumentalists. 6. Age and gender were directly related with bodily complaints; while the number of solo experiences was negatively related to body complaints. 7. Instrument specific body complaints were observed with singers and wind players reporting more regarding breathing, mouth and throat related complaints and pianists and string players reporting hand and arm related complaints. 8. Participants' number of years of instrument study showed a significant negative relationship with anxious feelings. Hours of daily practice had no other significant effects.

Irie, Morijiri and Yoshie (2023)	38 student musicians 39 piano students 6 singing = 15.8% singers	34 females;	Japan	Not mentioned	Semi-structured interview, Two open-ended questions about these performances: (1) what changes in mental and physical states they experienced and (2) how they coped with these mental and physical changes. Participants gave answers to these two questions for five different time periods around public performance: (1) from the beginning of the preparation for a public performance until the day before the performance (P1), (2) from the morning of the performance day until shortly before going onstage (P2), (3) during the public performance (P3), (4) from shortly after going offstage until the end of the performance day (P4), and (5) from the next day of the performance until shortly before the next public performance (P5).	1. Mental symptoms like negative feelings such as concern over mistakes and fear of evaluation peaked shortly before the performance. 2. Increase in physical symptoms such as increased heart rate, perspiration, cold hands, and gastrointestinal disturbances was noted before the performance. 3. During the performance, cognitive problems like memory slips and behavioural symptoms like tremor and muscle stiffness were reported. 4. Students perceived their physiological and behavioral symptoms more negatively, which could increase their subjective anxiety while professionals viewed MPA arousal as natural and unharmed. 5. Students tended to experience the three types of MPA symptoms for a longer duration than did professionals
Sims and Ryan (2023)	171 participants Voice - 35 participants- 20.47%	Female (n = 90; 52.63%), Male (n = 69; 40.35%), Gender-diverse (n = 9; 5.26%) preferred not to respond (n = 3; 1.75%)	US and Canada	Ages ranged from 21 to 56 years,	Kenny Music Performance Anxiety Inventory (K-MPAI) Eight subscales: Clinical cut-off score of 104 for MPA was used. (1) Proximal Somatic Anxiety and Worry about Performance (2) Worry/Dread (Negative Cognitions) Focused on Self/Other Scrutiny (3) Depression/Hopelessness (4) Parental Empathy (5) Memory (6) Generational Transmission of Anxiety (7) Anxious Apprehension (8) Biological Vulnerability	1. The results suggest a strong positive correlation between higher levels of MPA with higher frequency of impostor feelings. 2. The impostor feelings were more among females than males; higher in master levels students compared to doctoral or diploma students; higher among singles than married participants. 3. Responses indicated that over 75% of participants experienced clinically high levels of MPA and frequent to intense impostor feelings. 3. Worry/dread focused on Self/other scrutiny was more among the KMPAI subscale. Next was Proximal Somatic anxiety and worry about performance. 4. Virtual performances were more stressful than live performances. 5. People who started to perform later in life tended to have more MPA.

Ryan, Andrews and Tsang (2024)	85 college/university students 40% voice students =34 students	63% were women 29% men 6% nonbinary 1% not specified	US and Canada	Adults- Undergraduate and Master's students	Unidimensional two-factor STAI was used. Only state form was, as only situational contexts were conditioned The trait form was not used. Participants were asked to compare 2 situations - online/ virtual. 2 subscales of Frost Multidimensional perfectionism Inventory on 1. Concern over mistakes (CM) 2. Personal standards (PS)	1. online class performance evoked significantly higher MPA than in-person classes. 2. Students performing on new instruments reported significantly higher MPA than those performing on familiar instruments. 3. Concern about mistakes was related to MPA in both contexts. 4. Concern about mistakes and instrumental experience were significant predictors of MPA in the online classroom. 5. Gender differences were noted with regard to relationships between the measures with females scoring high.
Silva et al. (2024)	75 amateur gospel singers	male - 25 female - 50	Brazil	Age range 18 to 59 min 20 years max 58 years	26 item the Kenny Music Performance Anxiety Inventory (K-MPAI) and The Brazilian Portuguese version of the Singing Voice Handicap Index (S-VHI)	1. Post Performance vocal discomfort was linked to higher scores on both the K-MPAI and S-VHI. Additionally, environmental factors, such as exposure to louder instruments, correlated with increased vocal discomfort. 2. The K-MPAI levels- 46.67% of participants had low levels; 50.67% of participants had medium levels; and 2.67% had high levels of MPA. Most of the participants had only moderate levels of MPA.

Appendix B: *Influence of MPA in female singers*

Studer et al., (2011)	Women scored significantly higher on hyperventilation complaints and negative feelings of MPA.
Kokotsaki and Davidson (2003)	Females are more anxious in both as a personality trait and state condition in a jury situation.
Sulun, Nalbantoglu and Oztug (2017)	The level of anxiety in females is higher than that of males.
Patston and Osborne (2016)	Females experience a steeper and more intense developmental trajectory than males.
Kenny, Davis and Oates (2004)	Female scores were higher than male scores for all variables other than the Psychological stress quotient. Compared to males, females experienced higher trait anxiety, higher MPA both in solo or choral situations, higher perfectionistic tendencies, engaged in more personal resources and had higher maladaptive strain and stress due to ambiguity in occupational roles and physical environment.
Dobos, Piko and Kenny (2018)	Compared to men, females had significantly higher MPA symptoms, higher in social phobia inventory (non-specific social phobia including fear, avoidance, and physiological symptoms), had higher perfectionist tendencies and higher concern over mistakes.
Papageorgi (2020)	Girls experienced higher MPA levels than boys. Female musicians are more susceptible to the factors contributing to MPA, such as lower self-concept and self-efficacy, sensitivity to degree of self- exposure and audience presence.
Sims and Ryan (2023)	Impostor phenomenon was observed more among females than the male participants.
Ryan, Andrews and Tsang (2024)	Females had higher perfectionism, especially concern over mistakes than men.
Oudejans et al. (2016)	Women had higher worries and disturbing thoughts and higher focus on physical aspects. Compared to men, women also scored lesser on narrow focus, muscle related focus and thoughts that give confidence i.e. their self-confidence is lower.
Paliaukiene et al. (2018)	Did not find gender effects on MPA.

Irie, Morijiri and Yoshie (2023)	No comparison is made in this study.
Sokoli, Hildebrandt and Gomez, (2022)	Compared to male students, female students reported significantly more anxious feelings and catastrophizing.
Barbar, Crippa and Osório, (2014)	No statistically significant differences were found in relation to gender, although the scores of women were always slightly higher than those of men. Women reported increased avoidant behavior.

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