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Music Performance Anxiety in Popular Music Singers: Toward A New Approach

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by

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Contents

Acknowledgments.....	2
Contents.....	3
Abstract	4
1.Introduction	5
1.I. Music Performance Anxiety: phenomenology and treatments	5
1.II. MPA knowledge-gap.....	7
1.III. MPA in popular music singers	10
1.IV. Flow: phenomenology and literature	13
1.V. Flow knowledge-gap and relation to MPA.....	14
1.VI. Goals	17
2. Methods.....	18
2.I. Development of the new questionnaire	18
2.II. Questionnaire’s structure and comparison with standard questionnaires	20
Section 1 – Introductory questions	20
Section 2 – MPA therapies	21
Section 3 (MPA) and section 4 (Flow)	21
2.III. Distribution and descriptive statistics.....	24
2.IV. Statistical Analyses	27
3. Results.....	27
3.I. Statistical Analysis.....	27
3.II. Correlation tests and significance quantifications.....	29
3.III. Multiple regression analysis	31
4. Discussion.....	33
4.I. Caveats	36
5. Outlook and future directions.....	37
6. Conclusions	39
Bibliography	40
Appendix I: The MPA and Flow Questionnaire for Popular Music Singers.....	44
Appendix II: Full results of Reliability Statistics for MPA and Flow Sections	59

Abstract

This study researches the phenomenon of Music Performance Anxiety (MPA) in popular music singers, and its relation to the phenomenon of flow. Flow can be described as a mental and physical state in which the body seems to automatically know what to do. This mental and physical state is in many ways contrastive to MPA: while MPA is experienced as an insurmountable obstacle to a successful performance, during which our own body and mind seem to betray us and our brain freezes with fear and anxiety, flow is the state where the same activity seems effortless, and we feel at the peak or excellency. While most of the therapies currently implemented to face MPA are based on physical and mental relaxation, both MPA and flow seem to be based on physiological and psychological arousal. The strong negative correlation between the two mental states found by recent studies suggests the possibility that, rather than focusing on relaxation, MPA therapy approaches should train musicians to channel the physical and mental stress building up prior a performance into an experience of flow. A new MPA and flow questionnaire was designed to gather data from popular music singers about the occurrence of MPA and flow, the participants' attitude to the concept of stress, and the role played by instrument-specific factors (such as amplification, use of the microphone, writing of original material, use of lyrics, etc.) on the occurrence of MPA. Data gathered by the questionnaires were statistically analyzed, and a discussion based on the results is presented.

1.Introduction

1.1. Music Performance Anxiety: phenomenology and treatments

Music Performance Anxiety (MPA) is a situational manifestation of anxiety that is frequently experienced by musicians, and is generally related to the fear of making a mistake or not being able to control one's own actions in front of other people while performing (Cox and Kenardy, 1993). The stress generally builds up as the performance approaches, causing feelings of anxiety or panic that ultimately affect the performer's skills on stage, not allowing him to play or sing at his or her best (Ladano, 2016; LeBlanc *et al.*, 1997). An excessive level of MPA may even cause the performer to avoid live performances in front of an audience, thus threatening the musician's career, (Nideffer and Hessler, 1978; Osborne, Kenny and Holsomback, 2005; Shaw, Juncos and Winter, 2020). The definition and terminology of MPA are themselves problematic. Reviewing the literature, we may often encounter studies where 'stage fright', 'performance anxiety', and 'music performance anxiety' are used interchangeably, even though there is not always agreement as to the exact meaning of these terms (Kenny, 2011). In the current study, I will be using the terms "Musical Performance Anxiety" (MPA) and "Stage Fright", that are often paired in the literature as synonymous¹ (Brodsky, 1996; Cox and Kenardy, 1993; Kenny, 2011; Marshall, 2008; Osborne, Kenny and Holsomback, 2005; Salmon, 1990; Studer *et al.*, 2011; Weisblatt, 1986).

Another important differentiation has to be made regarding chronic and pathological performance anxiety and general non-clinical MPA. In this paper I will be considering exclusively the non-pathological and non-clinical phenomenon of MPA, experienced by a large percentage of the musicians' community through their studies and careers (Ascenso, Williamon and Perkins, 2016; Brodsky, 1996; Fishbein *et al.*, 1988; Kenny, 2011; Osborne and Franklin, 2002; Salmon, 1990; Studer *et al.*, 2011).

MPA manifests itself through a combination of affective, cognitive, somatic and behavioral symptoms, including physical responses to panic including high heart rate, high blood pressure, sweating, automatic physical reactions uncontrolled by the voluntary system (such as the feeling of "freezing"). MPA manifestation is situational and has no direct and unequivocal connection with age, background or level of experience (Brooker, 2015; Kenny, 2006; Osborne, Kenny and Holsomback, 2005; Zakaria, Musib and Shariff, 2013) nor with other general anxiety pathologies (Brodsky, 1996; Kenny, 2004; Osborne, Kenny and Holsomback, 2005; Salmon, 1990). Regarding the level of experience, it is in fact widely documented that even famous singers and musicians (like Caruso, Maria Callas, Barbra Streisand, Adele, Cher and others) had and still have to cope with notable problems of performance anxiety despite the success achieved during their careers (LeBlanc *et al.*, 1997). On the other hand, there are studies that found different levels of experienced MPA based on gender, showing that females experience MPA more than males

¹ In the questionnaire and through the whole communication with the study's participants, the term Stage Fright was used, rather than MPA, as a more generic and relatable term to define the issue, as I did not want the participants to be influenced by the associations the term Musical Performance Anxiety might bring to pathological problems, hence altering their responses.

(Kenny, 2006; Kenny and Osborne, 2006; LeBlanc *et al.*, 1997; Osborne and Franklin, 2002; Osborne and Kenny, 2008; Osborne, Kenny and Holsomback, 2005)².

The vast majority of studies on MPA is based on participants' self-reports, implementing questionnaires, interviews and other self-evaluation tools. There are very few studies in the field of MPA based on objective physiological measurements, since these measurements would have to be done in real-time during a performance. In 1997 LeBlanc *et al.* developed an experiment to evaluate the role played by the audience in the occurrence of MPA. Twenty-seven high-school music students were made perform alone, in front of one person and in front of a small audience. Participants had their heart rate measured during each performance, they filled self-evaluation questionnaire and underwent an interview after each performance. A similar experiment was developed in 2010 by Spahn *et al.* in order to measure physical responses to stress pre, during and after a performance. The experiment involved seven singers and two wind-players who performed on stage and rehearsed as their heart rate and blood pressure were measured by electrodes. Afterwards, the participants filled out a questionnaire inquiring about their state of mind and MPA occurrence. It is very hard to implement experiments of this kind, for obvious practical reasons, and studies like those of LeBlanc *et al.* and Spahn *et al.* stand out as exceptions among a research field that is mostly self-evaluation-based (Matei and Ginsborg, 2017).

A study conducted at the University of Iowa School of Music showed that 16.5% of the respondents indicated that their musical performance was impaired by anxiety; over 21% experienced marked distress while performing; 16.1% indicated that performance anxiety had adversely affected their careers (Wesner, Noyes and Davis, 1990). Another study conducted by the International Conference of Symphony and Opera Musicians, showed that 24% of the over 2000 respondents suffered from stage fright, 13% reported acute anxiety and 17% reported depression (Fishbein *et al.*, 1988). Furthermore, it is worth noting that, despite reporting the highest level of job satisfaction, musicians are among the five occupational groups most likely to report mental illness (Brodsky, 1996). The highest levels of MPA are generally triggered by solo performances, meaning that solo musicians or musicians that combine solo performances with orchestral/choral work, experience higher levels of MPA than musicians playing or singing solely as part of an orchestra or a choir (Cox and Kenardy, 1993; Papageorgi, Creech and Welch, 2013; Ryan and Andrews, 2009; Spahn, 2015). Other studies also depict different levels of MPA in orchestral musicians based on where they sit in the orchestra and their role in the section (Cohen and Bodner, 2018), showing how the musicians sitting closer to the conductor and having a leading role in their section (es. first violin, first cello, first viola) experience higher levels of MPA than those musicians sitting far from the conductor and not having a leading role in their section (the timpani players generally reported the lowest levels of MPA).

A similar correlation was found in choir singers (Jaros, 2008; Kenny, Davis and Oates, 2004; Ryan and Andrews, 2009), where the conductor's attitude and relationship with the choir, emerged as one of the key factors of MPA occurrence for choral singers.

² This gender-based difference in MPA research is consistent with results of research on general anxiety

A vast number of musicians have to face MPA throughout their careers. While many studies have so far looked into how and why MPA is experienced, and what are the origins of it (Fishbein *et al.*, 1988; Kenny, 2011, 2006, 2016; Kenny and Osborne, 2006; LeBlanc *et al.*, 1997; Osborne, Kenny and Holsomback, 2005), I will focus on how is MPA treated today and how we can approach it differently.

1.II. MPA knowledge-gap

For long, MPA was studied as a situational form of social anxiety, and therefore treated as such (Brodsky, 1996; Cox and Kenardy, 1993; Gorges, Alpers and Pauli, 2007; Kenny, 2011, 2016; Osborne and Franklin, 2002; Weisblatt, 1986), with pharmaceutical therapies being often promoted across musicians' communities to allow them to suppress the somatic reactions to the anxiety. In the last thirty years, research on MPA began focusing on the phenomenon as a particular subcategory of social anxiety, with characteristics that distinguish it from general social anxiety, such as high (versus low) self-expectations, commitment to (versus avoidance of) the challenge that terrifies the musician and fear of judgement by others being secondary (versus being primary) (Simoens, Puttonen and Tervaniemi, 2015) and with perfectionism playing a much larger role than social anxiety as a trait to predict MPA (Gorges, Alpers and Pauli, 2007; Kenny, 2011; Kenny, Davis and Oates, 2004; Kenny and Osborne, 2006).

If 20-30 years ago pharmaceutical therapies were widely suggested to a musician suffering from MPA (Barlow, 2002; Brodsky, 1996; Salmon, 1990), today, more and more studies investigate the effectiveness of alternative therapies such as psychoanalysis, hypnotherapy, cognitive-behavioral treatments, multimodal therapies, EMD (Eye Movement Desensitisation), meditation, body relaxation therapies (such as Alexander Technique), and others (Ascenso, Williamon and Perkins, 2016; Brooker, 2015; Kenny, 2004, 2011; Marshall, 2008; Nagel, Himle and Papsdorf, 1989; Robertson and Eisensmith, 2010; Schachter and Singer, 1962; Shaw, Juncos and Winter, 2020; Spahn, 2015). Recently, some studies were designed to investigate the use of free improvisation and other music-bases therapies as a tool to cope with MPA (Forbes, 2020; Ladano, 2016; Rush, 2013). While, for now, no statistically significant results were obtained in this direction, it is interesting to point out how, while music-therapy is considered highly effective and is largely used to face anxiety in non-musicians, it is very rarely proposed as a tool to face anxiety in musicians' communities (Rush, 2013).

It is also worth noting that there is still a high percentage of musicians (as high as 31%) using Beta-blockers³ to face MPA and that the decreased research interest on pharmaceutical treatments might be caused by the research ethical standards being more rigorous today than fifty years ago (Kenny, 2004, 2011; Shaw, Juncos and Winter, 2020). However, it was also shown how pharmaceutical treatments are effective for those musicians who experience the somatic effects of performance anxiety (physical response to stress), but not for those who suffer from the psychological and emotional effects (Kenny, 2004, 2011; Kenny, Davis and Oates, 2004).

³ Beta-blockers are a class of medications that are predominantly used to manage the somatic reactions to anxiety, such as heart rate, blood pressure and the physiological reactions to adrenaline

Furthermore, pharmaceutical therapies have been shown to flatten the emotional and psychological response of the performer regardless of it being positive or negative and, as a result, many musicians that opted for pharmaceutical therapies complained about the performances being colder and less genuine (Kenny, 2004). Additionally, one important side effect of Beta-blockers is the constriction of the airways, therefore they are not indicated for singers, wind and brass instrumentalists (Kenny, 2011; Shaw, Juncos and Winter, 2020).

The therapies reported above treat MPA mostly as a general anxiety disorder, and do not refer to any specific need of musicians. Body relaxation techniques can focus on parts of the body that the musician uses to play, and through meditation the musician can be guided through the situational emotional reaction to the performance, but none of them is specifically designed to help musicians rather than actors, sportsmen or any other category of people affected by performance anxiety. However, many studies pointed out that the anxiety experienced by musicians is situational: the anxiety experienced by musicians is directly correlated to the performance and dependent on specific aspects of the same, such as the size of the audience, the presence of judges, the fear of evaluation, the need to impress the teachers/parents/peers, etc. (Brodsky, 1996; Gorges, Alpers and Pauli, 2007; Kenny, 2011; LeBlanc *et al.*, 1997). Performance anxiety in the case of musicians might therefore be more effectively approached as a professional issue, related to the musicians' job and career, and the treatment might also be more effective if specifically designed with this goal in mind. Such methods should therefore be dedicated to the musician's needs, directly addressing the use of the instrument, the practice, the stage presence and the relation with the audience (Brodsky, 1996; LeBlanc *et al.*, 1997; Wolfe, 1989).

The notion of instrument-related aspects of MPA is not new. Already in 1989, Wolfe found instrument-specific symptoms to arousal: wind players would experience mouth dryness, pianists would suffer from excessive hand sweating and tremor, violinists would have cold hands etc. (Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989). Despite this, little research has been developed to investigate instrument-specific approaches to MPA. Only recently a few studies focused on the correlation between the musician's instrument and the occurrence of MPA and posed the question whether MPA should be dealt with using instrument-specific techniques (Cohen and Bodner, 2018; Manning, 2013). Other studies have tried to assess a relation between the musician's music genre and the occurrence of MPA (Barbeau, 2011; Papageorgi, Creech and Welch, 2013), suggesting that musicians may experience MPA differently based on their musical genre.

I would therefore like to propose approaching Musical Performance Anxiety in a practical way, focusing on specific tools for the musician's instrument. A pianist might benefit from specific work on physical relaxation of the hands. String instruments players might find useful tools to deal with sweaty fingertips or bad acoustic that does not allow them to hear their pitch. Wind and brass musicians might need tools to deal with hyperventilation or would benefit from oral hygiene tips to strengthen confidence on stage. If the type of Performance Anxiety is affected also by the type of instrument and music genre, shouldn't the therapy be developed considering the specific needs related to these parameters?

This is not to say that therapies that aim at treating the general somatic reactions to stress (blood pressure, heart rate, etc.) cannot be effective themselves. By treating the general physical reaction to arousal (*e.g.*, by reducing heart rate with pharmacological intervention or with meditation), also those somatic reactions that are instrument-related (*e.g.*, sweaty fingers or difficulty in breathing) might benefit from the treatment. Most of the therapies currently in use are based on this very idea. That being said, since instrument-related aspects of the experience of MPA have been found (Barbeau, 2011; Cohen and Bodner, 2018; Manning, 2013; Papageorgi, Creech and Welch, 2013; Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989), it would be interesting to research whether MPA therapies taking in consideration those same aspects could be paired to current MPA coping therapies and, this way, offer a relevant and effective addition. Other studies have approached the issue from a different perspective, focusing on the role of the teachers and music school's education regarding MPA (Nideffer and Hessler, 1978; Papageorgi, Creech and Welch, 2013; Shaw, Juncos and Winter, 2020; Studer *et al.*, 2011)(Nideffer and Hessler, 1978; Papageorgi, Creech and Welch, 2013; Shaw, Juncos and Winter, 2020; Studer *et al.*, 2011). Until ten years ago, in most educational programs, the issue of MPA was not discussed, and in others it was even dismissed. Only thirty years ago, it was common for teachers to claim performers must experience anxiety in order to perform at their best (Nideffer and Hessler, 1978). This way of approaching the problem leaves students unable to face MPA on their own, often leading them to choose a different career path. Furthermore, no standard educational program to address MPA in music schools for young musicians and no programs preparing music teachers on how to help their students facing MPA, means that the first person a music student would go to for help when facing performance anxiety issues, the teacher, is not prepared to address the issue with his students, and could at best provide personal advices (Shaw, Juncos and Winter, 2020).

In most recent years, as the research on MPA started focusing on preventing techniques, rather than on damage-control therapies, the role of education has been brought up more and more often (Barbeau, 2011; Çırakoğlu and Şentürk, 2013; de Figueiredo Rocha, 2020; Gerhard *et al.*, 2018; Kenny, 2011, 2016; Robertson and Eisensmith, 2010; Shaw, Juncos and Winter, 2020; Zakaria, Musib and Shariff, 2013) and the approach to MPA started shifting in music schools as well. Some of the leading music schools in the world have started developing programs specifically designed to teach students about MPA and how to face it, in an attempt to prevent the problem. A commendable example is given by the Berklee Music School, that in the past five years has started to include in their undergraduate programs a compulsory course teaching about performance anxiety and started training their music teachers on how to help their students suffering from MPA. Furthermore, in 2014 Berklee founded the *Effortless Mastery Institute*, aiming to teach students suffering from MPA coping techniques elaborated in the book "Effortless Mastery" written in 1996 by Kenny Werner, who is also the Effortless Mastery Institute's director and one of Berklee jazz program's music teachers. Other major music schools started following the trend: since 2019 The American Musical and Dramatic Academy (AMDA) offers a course on improvisation and MPA coping methods in their gap-programs and Juilliard School of Music published some articles about performance anxiety in their school's blog and

newsletter. But aside from these praiseworthy examples, there are many music schools, even major ones, not addressing the issue in their programs, and, most importantly, there is no standard program for music teachers to train them on preventing and facing MPA in their students.

The issue of MPA education is becoming of great interest both in the academic and the education worlds, and as the two become more and more aware of one another, new and interesting models of approach are being developed (Barbeau, 2011; Çırakoğlu and Şentürk, 2013; de Figueiredo Rocha, 2020; Kenny, 2011, 2016; Studer *et al.*, 2011) some of which aim specifically to give music educators tools they can use with students struggling with MPA (Robertson and Eisensmith, 2010; Shaw, Juncos and Winter, 2020).

Worth of notice is the study of Shaw *et al.* (2020) that researched the effectiveness of the Acceptance and Commitment Coaching system on MPA treatment. They pointed out how, while MPA treatments have so far focused on the intervention of psychologists and therapists, a student suffering from MPA would first of all seek help from their teacher, rather than from a mental health professional. Shaw *et al.* postulated the option of having music teachers themselves trained by psychologists and therapists on interventions to face MPA. They had a music teacher trained to use an evidence-based coaching model, Acceptance and Commitment Coaching (ACC) to help a student suffering from MPA. ACC is a particular version of Acceptance and Commitment Therapy (ACT). While ACT is used with clinical patients suffering from chronic mental health pathologies, ACC was developed as an alternative approach to be used with non-clinical populations. Although Shaw's study cannot yet provide us with statistically significant results, it still is an inspiration for further work in the direction of not only teaching students about MPA, but also, and foremost, training music teachers about it, so to avoid their students leaving the field simply because they did not get the tools to deal with MPA (Shaw, Juncos and Winter, 2020).

Therefore, the second aspect I would like to focus on, in the new approach I intend to propose in facing MPA, is the preparation of music teachers themselves on how to approach the issue with their students, and encourage music schools to introduce educational classes on MPA to their curricula.

1.III. MPA in popular music singers

As described, most studies on MPA do not distinguish between different instruments, but there are a few that do focus on specific communities, for example singers (Forbes, 2020; Kenny, 2016; Ryan and Andrews, 2009; Spahn *et al.*, 2010). Singers are a particular group in the musicians' community.

First, singers need to handle an internal (versus external) instrument. They are the only musicians who make use of an instrument that was not designed nor constructed by human hands, that cannot be seen while played and that the functioning of which is still not entirely clear even to scientific research (Burwell, 2006; Kob *et al.*, 2011). The relation singers have with their instrument, when practicing and developing it, is much more emotional and psychological than

that of any other musician, so that singers will rely on felt emotion and extra-musical meaning also when working on technique (Burwell, 2006; Forbes, 2020; Foulds-Elliott *et al.*, 2000; Weir, 1998). The practice of a singer is based on the gain of consciousness in the use of semi-voluntary muscles, such as those that support the breath (the diaphragm, the intercostal muscles, the pelvic sphincter muscles, etc.) and those that control the vocal system (the false vocal cords, the epiglottis, the muscles controlling the position of the larynx and of the thyroid, etc.) (Forbes, 2020; Kob *et al.*, 2011). Developing these muscles and the consciousness that derives from controlling them, allow singers to rely less on external auditory feedback when singing, and more on their own kinesthetic knowledge (Erdemir and Rieser, 2016; Weir, 1998). In order to develop the necessary consciousness to control these muscles, the singer has to undergo an emotive and psychological process mostly unknown to instrumentalists. For this reason, not only singers will adopt imagination and emotional states to learn to control their instrument psychologically and emotionally, but vocal coaches themselves tend to teach singing using metaphorical vocabulary more than instrumental teachers (Burwell, 2006).

Second, singers have no external instrument to focus on in order to shield themselves from the direct contact with the public. If it is acceptable and even normal to see a pianist, a guitarist, or a violin soloist that, while playing, focuses exclusively on the instrument without looking at the audience even once, the same thing is not acceptable for a singer. The singer, be it the main character in an opera or the front woman of a pop music band, has to relate directly to the public, engage it, move it (Weir, 1998). Singers cannot just turn their back to the audience and pretend it is not there: the relationship with the public is essential to the success of the performance. This is not to claim that this aspect does not apply to instrumentalists as well, but for singers the amount of direct contact with the audience is larger and more intrinsic to their performance, and it is not filtered by an external instrument. (Burwell, 2006; Weir, 1998)

Last, singers need to use language. Apart from some intentional and eccentric exceptions, words and their meaning play a central role in the work of singers. The music doesn't stand alone, but is embroidered around the lyrics and the story they are telling, and singing involves a text which must be understood, internalized and communicated. In this, the singer's work resembles more that of an actor than of a musician. (Burwell, 2006; Sundberg and Romedahl, 2009; Weir, 1998)

As generally there is no specific focus on the type of instrument, we can see in MPA literature a lack of focus on specific music genres as well, and, particularly, the almost total absence of studies conducted on musicians of popular music genres (such as jazz, musicals, pop, rock, hip-hop etc.). Some studies do consider also popular music and jazz musicians (Kenny, 2011; Osborne and Franklin, 2002; Papageorgi, Creech and Welch, 2013) and in 2011 a Performance Anxiety Inventory was developed specifically for popular music and jazz musicians (Barbeau, 2011), but these examples are exceptions: in most cases popular music musicians are included as a minority in much larger samples of classical music musicians, and popular music singers are not considered all-together. In fact, even the studies on MPA that do focus on singers, lack an investigation on the needs and peculiarities of popular music singers, even though popular music singers' needs can be largely different from those of opera or choral singers (Forbes, 2020; Frič and Podzimková, 2021; Papageorgi, Creech and Welch, 2013; Sundberg and Romedahl, 2009; Weir, 1998).

First, the amplification. The first obvious difference between opera singers and popular music singers is the way they project their voice. Opera vocal projection technique instructs the singers to lower their larynx, allowing them to increase the sound sonority by creating a bigger internal soundboard (Frič and Podzimková, 2021; Sundberg and Romedahl, 2009). This technique was essential when amplification was not yet existent to allow singers to be heard in big concert halls. Amplification draws a differentiation line between popular music and opera singers also because of the relationship between the singer and the amplification itself. Generally, singing students do not learn enough about sound and amplification during their music education and find themselves working with monitors and microphones for the first time when they are already on stage. The use of microphones requires a basic knowledge of how amplification works, and singers must know what to ask of the soundman in order to hear their own voice properly. There is no study, to my knowledge, that examines this issue. I therefore rely on my own experience as a singing student and, later, as a vocal coach and music educator in saying that most singing students don't know how to hold the microphone correctly, are not familiar with the basic knowledge of acoustics and of amplification use, do not know what to ask of the soundman, and are startled the first times they hear their voice from a monitor. They end up not hearing themselves properly during the first concerts, often hurting themselves by singing in an incorrect way or having traumatic experiences for being out of pitch. As a consequence, many of my own singing pupils reported that microphone use plays a big part in their performance anxiety – a part which is completely absent in instrumentalists or classical singers. Learning the basics of sound control, amplification and microphone use should be at the very base of any program for popular music singing, and would solve a lot of traumas student singers develop in their first years of training.

Second, the lyrics. With the development of technology and amplification, singers were suddenly allowed to sing keeping the larynx in its natural position (the same as when we talk). This opened a world of new vocal possibilities, such as the use of whispers and murmurs, speech-like vocal range, spoken words and others. Singing with natural larynx position allows the lyrics to get through in a much more comprehensible way (Sundberg and Romedahl, 2009) so that lyrics gained a completely new weight in the musical material of songs.

Last, the music itself. The public of classical music is generally already familiar with the repertoire and often goes to live concerts precisely because they like the music. Thus, an opera singer will very rarely be anxious about the audience not liking the music they are going to sing. On the other hand, popular music singers often find themselves in the position of being songwriters themselves, or front men and women of musical groups making their way in the world of the music industry and performing original music material for the first time in front of an audience. Consequently, popular music singers might very well be anxious about the audience's reaction not only to their singing, but to the music itself. This assumption is based solely on my own experience as singer and song-writer, as no study was ever conducted, to my knowledge, to investigate MPA levels in musicians who write their own music and perform with it. Additionally, this hypothesis might of course not be relevant for those singers who do not perform original

material, but, as we will see in this study, there is a large percentage of popular music singers who do indeed write their own music and perform with it.

In this research, I will focus on a specific group in the music professionals' community, which is popular music singers. I will refer to popular music genres as those genres that usually require the use of amplification and where the singer has a modern music vocal projection, with no lowered larynx (as opposed to an opera vocal projection, that requires a lowered larynx).

1.IV. Flow: phenomenology and literature

Flow (occasionally referred in the literature to as “boost”) is the physiological state associated with optimal performance and optimal experience that occurs when there is a balance between perceived challenges and skills in an activity (Csíkszentmihályi, 1990; Jackson *et al.*, 2001). Flow occurs when one is totally involved in the task at hand, and is by definition intrinsically rewarding, regardless of how demanding the activity is (Csíkszentmihályi, 1990). Flow can be defined as an experience that stands out as being better than average, where the individual is totally absorbed in what she or he is doing, and where the experience is very rewarding in itself (Jackson, Eklund and Martin, 2010). When related to music, flow is often described as the optimal mental state where the music just “flows” out without any effort (Csíkszentmihályi, 1990).

Although flow has been of interest in both the music and the sports fields for quite some time now, researchers are often hesitant about the pursuit of research in this area, mainly because of the difficulties in the experimental phase. Much like in MPA studies, flow research is in fact mainly carried out with participants' self-evaluation and self-report instruments, since it is very difficult to measure their physical and mental state in real-time during a performance. Still, research on flow has increased in recent years, especially in the field of sports (Jackson *et al.*, 2001; Jackson, Eklund and Martin, 2010; Jackson and Robert, 2002; Kawabata, Mallett and Jackson, 2008) but also in the scope of positive psychology and music (Ascenso, Williamon and Perkins, 2016; Cohen and Bodner, 2018, 2019; Jaros, 2008; Keller *et al.*, 2012; Landhäußer and Keller, 2012; McGonigal, 2015; Schiepe-Tiska and Engeser, 2012; Simoens, Puttonen and Tervaniemi, 2015).

The first and most cited scholar of flow is Mihail Csíkszentmihályi, who also named the phenomenon in 1975. In 1990 he conceptualized nine dimensions to define flow experience: challenge-skill balance (we feel engaged by the challenge, but not overwhelmed by it); action-awareness merging (we are completely absorbed by the task at hand and do not overthink the situation, *i.e.*: “what would happen if a I made a mistake”); clear goals (we have a clear purpose and good grasp of what to do next); unambiguous feedback (we know how well we are doing); concentration on task (we are only aware of what is relevant to the task at hand, and we do not think about unrelated things); sense of control (we feel as if we are able to do anything we want); loss of self-consciousness (we are too involved in the activity to care about projecting our ego, *i.e.*: “how do I appear to the audience”); time transformation (a distorted sense of time occurs, it may slow down or fly by); autotelic experience (the experience is intrinsically rewarding, it has purpose and end in itself). Together these nine dimensions represent the optimal psychological

state of flow, although it is worth noting that Csíkszentmihályi himself relied primarily on the challenge-skill balance dimension to measure flow (Csíkszentmihályi, 1990).

Csíkszentmihályi's model is being widely used as base to study flow in all fields. Concentrating on the experience of flow in physical activity, Jackson and Eklund developed in 2002 two related yet separate flow scales: The Flow State Scale – 2 (FSS-2) and the Dispositional Flow Scale – 2 (DFS-2). Both scales were developed as a self-report scale on flow experience in physical activity, and they were both based on Csíkszentmihályi's nine dimensions model of flow. In 2008 Martin and Jackson developed a short version of DFS-2, where instead of the original 36 items, the participants would have to rate only 9, one per each flow dimension of Csíkszentmihályi's theory (Jackson, Eklund and Martin, 2010; Jackson and Robert, 2002). Historically, the flow scales have primarily been used in sports and other physical activity settings, but research has demonstrated the utility of the flow scales in other settings, including music (Jackson, Martin and Eklund, 2008; Jackson and Robert, 2002).

In the music field the occurrence of flow was also found to be influenced by situational scenarios. For example, Schiepe-Tiska and Engeser (2012) showed that the flow levels experienced by music students was positively correlated to the flow levels experienced by their music teachers. Jaros (2008) found something similar in the relation between conductor and orchestra musicians: the higher the rate of the experienced flow in the conductor, the higher the flow rate in the musicians (Jaros, 2008; Schiepe-Tiska and Engeser, 2012).

However, the study of flow experience in professional musicians still lags behind and there is a scarcity of data exploring professional musicians' experiences of flow (Cohen and Bodner, 2018). Even so, in the last years research in the field of music is starting to focus on the phenomenon of flow and, even more interestingly, on the relation between flow and MPA (Ascenso, Williamon and Perkins, 2016; Cohen and Bodner, 2018, 2019; de Figueiredo Rocha, 2020; Jaros, 2008; Kenny, 2016; Simoens, Puttonen and Tervaniemi, 2015; Spahn, 2015).

1.V. Flow knowledge-gap and relation to MPA

Some early studies in other fields already identified a positive correlation between ratings of flow and perceptions of peak performance (Jackson and Marsh, 1996; Jackson and Robert, 2002). More recently, specific questions were raised in the field of MPA research: if there is a positive correlation between flow and peak performances, and a positive correlation between MPA and low-quality performances, could there be a negative correlation between flow and MPA? And if this is the case, can flow play a key role in overcoming MPA? (Cohen and Bodner, 2018, 2019; Keller *et al.*, 2012; Kenny, 2006; Kenny and Osborne, 2006; Landhäußer and Keller, 2012; Matei and Ginsborg, 2017; Simoens, Puttonen and Tervaniemi, 2015).

As we saw, most of the literature devoted to overcoming MPA focused on developing techniques for treating the pathological and debilitating effects of anxiety. Following the idea that MPA is connected to physical, emotional and mental arousal, these techniques aim at avoiding or suppressing this arousal to avoid the occurrence of MPA, and generally rely on tools and exercises to calm and relax the performer. However, many studies found that arousal in the performer is

necessary for the performance to be successful in the experience of both the audience and the performer (Alpert and Haber, 1960; Cohen and Bodner, 2018; Csíkszentmihályi, 1990; de Figueiredo Rocha, 2020; Jaros, 2008; Kenny, 2011, 2006; LeBlanc *et al.*, 1997; Nideffer and Hessler, 1978; Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989).

Commonly, the relation between stress arousal and MPA occurrence in musical performance is represented using the so-called “inverted U-shape model”, derived from the Yerkes-Dodson law (Barbeau, 2011; Kenny, 2011; Simoens, Puttonen and Tervaniemi, 2015). According to this model, both high or low levels of arousal result in poor performance, either due to an excess of physical and mental arousal, or to a total lack of it. Optimal performance is therefore achieved at a moderate level of arousal. In this model, however, flow and MPA are seen as part of the same continuum, and are therefore mutually exclusive. If this were the case, we would assume that, being MPA the effect of an excessive level of arousal, the techniques to face MPA should be centered on relaxation (as in fact are most techniques currently in use) and that the experience of flow, antithetical to that of MPA, could be achieved by lowering the levels of arousal. However, the correlation between flow and MPA seems to be more complex, as they both rely on excitation rather than relaxation, and therefore the inverted U-shape model has been criticized over the years for its over-simplicity (Barbeau, 2011; Kenny, 2011; Simoens, Puttonen and Tervaniemi, 2015). The kind of arousal perceived when experiencing flow (“energy arousal”) is very different from the arousal perceived experiencing MPA (“anxiety arousal”), but it is still arousal, not relaxation. The somatic reactions to stress are similar (*e.g.*, increased adrenaline levels and heart rate) but the outcome of the experience being bad or good (MPA or flow) is influenced by the performer’s own interpretation of these physiological signs (Kenny, 2006; Kenny and Osborne, 2006; McGonigal, 2015; Schachter and Singer, 1962; Studer *et al.*, 2011).

This idea of two opposite kinds of stress-induced arousal is not new to the field. Relying on the work by Alpert and Haber (1960) in which the existence of two kinds of anxiety (debilitating anxiety and facilitating anxiety) was hypothesized, Wolfe (1989) developed a study to evaluate the presence of both positive and negative effects of MPA (Alpert and Haber, 1960; Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989). Their results showed that optimal performance was not depicted by the participants as an experience of calm or relaxation, nor as a state of moderate arousal as hypothesized by the U-shape model. In fact, both MPA and flow experiences were connected to physical and mental arousal, with quantitatively and qualitatively similar somatic symptoms (McGonigal, 2015; Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989). Interestingly, Csíkszentmihályi himself suggested both a strong relation between flow and arousal (as opposed to relaxation) and a cognitive essence of flow, describing the experience of flow as a product of our will and intention, rather than the casual result of fortuitous circumstances:

“[...] The best moments in our lives, are not the passive, receptive, relaxing times [...] the best moments usually occur when a person body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile. Optimal experience (i.e., the experience of flow) is thus something that we make happen”

(Csíkszentmihályi, 1990)

Regarding the concept of flow being the result of a cognitive, conscious act, I would like to consider two different studies from the field of positive psychology.

The first one, done in 1962 by Schachter and Singer, researched the effect of cognitive acts on emotional reactions. They showed that the emotional reaction to a certain situation is strictly connected to a physiological arousal, and that the same physiological arousal can be perceived differently and can lead to antithetical emotional responses depending on the cognitive reaction of the subject (Schachter and Singer, 1962). This suggests that with a cognitive action, the subject (in our case, the performer) could channel the physiological and mental arousal toward a performance that might lead either to a negative experience (MPA), or into a positive one (flow). The second study is a more recent one. In 2012, Keller *et al.* examined results from a 1998 survey from National Health Interview Survey, where 186 million subjects were asked a) under what amount of stress they felt to be in the 12 months previous to the survey (a lot, a moderate amount, relatively little, almost not at all) and b) how big they felt was the effect of stress on their general health (a lot, some, hardly any, or none). They then confronted the results of the survey with the prospective National Death Index mortality data of 2006, to see who of the subjects of the 1998 survey had passed away in the meanwhile. The two interesting results are a) 33.7% of the 186 million subjects perceived that stress affected their health a lot or to some extent, meaning there is a large percentage of the Western population that believes stress is bad for their health and b) both higher levels of reported stress and the *perception* that stress affects health, were *independently* associated with an increased likelihood of worse physical and mental health. In fact, the individuals that reported both experiencing high amount of stress levels *and* believing that stress affects their health, resulted to be at a greater risk of premature mortality, over and above those who reported experiencing high stress levels but did not believe stress is bad for their health. That is, the *belief* that stress is bad for you has an impact on your health as much as experiencing high levels of stress does. Paradoxically, based on the results of the study, if you experience high levels of stress but *do not believe* that stress is bad for you, you are less likely to suffer from premature health problems than someone with a moderate to high level of perceived stress, who believes stress is bad for him (Keller *et al.*, 2012; McGonigal, 2015).

This study raised some questions around the negative role psychology has taxed upon the whole concept of stress, and how many generations of patients were told to try and avoid stress. The results of this study shed light on a new element in the equation correlating the perceived stress levels with physical and mental health, which is whether, when we perceive high levels of stress, we also believe that stress is bad for us or not. These results suggest that a big role in that equation, connecting high levels of perceived stress with deteriorating physical and mental health, is played by this belief that stress is bad for us. This study is part of a new line of thought, developing in the past twenty years in the field of positive psychology, that is now suggesting that we should find a new way to use stress, rather than avoid it altogether. It is however important to note that this does not apply to chronic or clinical stress, which are pathologies and should be treated as such. It applies solely to the non-pathological kind of stress we all might experience during moments of our life (Ascenso, Williamon and Perkins, 2016; Barlow, 2002;

Gorges, Alpers and Pauli, 2007; Keller *et al.*, 2012; McGonigal, 2015; Shaw, Juncos and Winter, 2020).

This new perspective on our ability to use stress to our advantage, is also the basis to the idea that several studies on MPA have been suggesting for the past fifteen years: teaching how to enhance flow could help preventing MPA. Performing in front of an audience is a stressful situation, there is no point in trying to be calm when on stage. Avoiding stress entirely is not only impossible but may even have negative consequences: The physical and mental effects of the arousal might burst out unexpectedly when already on stage, with the performer not equipped to control them. Therefore, instead of trying to avoid the stress altogether, we could learn how to use it at our advantage, and learn how to re-shape and re-channel the physical and emotional arousal that is correlated to MPA, into a flow experience (Cohen and Bodner, 2018, 2019; de Figueiredo Rocha, 2020; Kenny, 2006; Kenny and Osborne, 2006; Osborne and Kenny, 2008; Simoens, Puttonen and Tervaniemi, 2015; Spahn, 2015).

Even though the idea of a positive effect of stress in the field of music dates back to the 1980s, and literature have been suggesting that flow could be a powerful tool to cope with MPA for almost twenty years, research started actively studying the correlation between flow and MPA only in recent years. In 2018 Cohen and Bodner developed a study to verify the relation between Flow and MPA in orchestral musicians, trying to provide support to that very suggestion that facilitating Flow could be a helpful tool to face MPA. They used a combination of different standard scales to measure MPA, flow and general anxiety traits. To measure the occurrence of flow they used the Martin and Jackson's short version of the DFS-2, based on the 9 dimensions of Flow theorized by Csíkszentmihályi, while for MPA they used the Performance Anxiety Inventory (PAI) developed by Nagel *et al.* (1981) to measure levels of performance anxiety. Both scales were not specifically developed to research the phenomena in musicians, but have already been used in a number of studies done specifically on musicians (Cohen and Bodner, 2018; Kenny, 2011). Cohen and Bodner found that the majority of professional classical orchestral musicians indeed experience flow and that there is a strong negative correlation between flow and MPA. Given all of the above, the third and central aspect I would like to consider in my research is the enhancement of flow as a tool to cope with MPA. We might consider the states of flow and MPA as two sides of the same coin: the physical and mental arousal building up towards a performance. In this scenario we should try to give performers tools to learn how to flip the coin at their advantage. Not avoiding stress but learning how to use it and channel it into a flow experience, so that it won't take control of our physical and mental reactions escalating into an experience of MPA.

1.VI. Goals

The overarching objective of this study is to propose a new approach to MPA based on practical aspects specific to popular music singers, the role of teachers and music institutions, and the enhancement of flow as a tool to overcome MPA. To do so, I focus on three specific aims:

- To validate a new questionnaire developed to investigate the occurrence of MPA and flow in popular music singers
- To verify in a population of popular music singers, aspects researched by previous studies (*e.g.*, flow and MPA correlation; MPA levels and daily anxiety levels relationship; MPA occurrence and gender relationship; MPA occurrence and level of experience relationship; stress attitude and daily anxiety levels relationship)
- To investigate the potential relation between the occurrence of MPA and flow and aspects specific to the popular music singers' experience (*e.g.*, use of amplification, performing with original material, the use of lyrics, etc.).

The new questionnaire seeks to a) evaluate whether specific aspects of popular music singers' experience have a correlation with the occurrence of MPA and should therefore be considered when approaching therapeutical methods to face MPA, b) measure the levels of MPA and flow in popular music singers and their approach to the concept of stress, and c) recreate the negative correlation between flow and MPA found by previous studies (suggesting that enabling flow could be a valid therapy for MPA) and examine whether the emotional and mental reactions to both experiences is connected to physiological arousal and similar somatic factors.

I will then try and draw a general outline for the development of a new kind of approach to MPA, that will include training for music teachers regarding flow and MPA, an MPA-flow educational program for Popular Music Students that considers needs specific to their instrument and a new therapy to MPA that includes positive psychology intervention, where the student will learn physical and psychological techniques to channel the stress building up prior a performance.

In the following sections of the document, I will exhibit the development process of the new questionnaire, its contents and distribution (2. Methods), the results of the statistical analyses of the questionnaire (3. Results), the following discussion (4. Discussion) and proposal for the development of a new method to treat MPA (5. Outlook and future directions) and conclusions (6. Conclusions) based on aforementioned results.

2. Methods

2.1. Development of the new questionnaire

In MPA and flow research it is common to use scales and questionnaires developed for general performance or social anxiety disorders, like the Performance Anxiety Inventory (PAI) developed by Nagel et. al. in 1989, or the short version of the DFS-2 developed in 2008 by Martin and Jackson. Even those questionnaires that are developed specifically for MPA, like the K-MPAI (Kenny, Davis and Oates, 2004) or the MPAI-A (Osborne, Kenny and Holsomback, 2005), do not consider specific aspects of MPA related to the instrument, and, to my knowledge, there is no flow scale specifically developed to research the phenomenon in musicians. After considering the standard questionnaires available in literature and noting the lack of a questionnaire that would allow me to research the specific instrument-related aspects of MPA and flow, I decided to develop a new MPA and flow questionnaire for popular music singers. To develop the

questionnaire, I partially relied on the PAI (Nagel, Himle and Papsdorf, 1989) and the K-MPAI (Kenny, Davis and Oates, 2004) questionnaires.

In the process of developing the questionnaire, the question rose whether the terminology used should stick to Musical Performance Anxiety or not, and whether an explanation regarding the meaning of “flow experience” was necessary. The term MPA is not commonly used among musicians to define the issue and might bring associations of pathological conditions affecting (in one way or another) the participant’s answers. Similarly, the term flow is un-common in the musician’s community, and an explanation of the meaning of the term might have made the experience less fluid for the participants. Therefore, it was decided to use the term “stage fright”, more used and common in the everyday life of a musician, and to not define the flow experience with any particular term.

A first pilot of the questionnaire was run on 17 colleagues, Israeli popular music singers ages 22 to 38. The pilot showed good reliability (.841 for the MPA section and .688 for the flow section). After analyzing the pilot’s results and after interviewing the participants to gain insights on the questionnaire, changes were made:

- The questionnaire was made anonymous.
- The term “Music Performance Anxiety” was substituted with “Stage Fright”.
- The paragraph explaining what is flow was removed.
- The question inquiring into the participants’ background was split to distinguish the country of current residency (where do you live?) and the country of birth (where are you from?).
- A question for female participants asking about the correlation between MPA occurrence and the menstrual cycle was added.
- Some questions of MPA and flow were rephrased.
- The questionnaire was translated in Hebrew and Italian, since the Italian and Israeli populations encountered difficulties in completing the questionnaire in English.

Overall, the questionnaire is intended to enquire about parameters already researched by the literature as well as new parameters (boldface) related to the specific community of popular music singers:

- The parameter of experience
- The parameter of gender
- The participant’s attitude toward stress
- The participant’s general anxiety level in everyday life
- The level of occurrence of flow
- **The use of the microphone and amplification**
- **The training on the use of the microphone**
- **Somatic reactions to stress involving the larynx, the vocal cords and the breathing**
- **The performance with original material**
- **The use of lyrics**

The final questionnaire used in this study is composed of four sections:

Section 1 – Introductory questions: The participants’ age, gender, country of birth, country of residence, music education level, attitude toward microphone use and amplification, general anxiety level, experience with MPA, attitude toward stress, whether or not they ever tried therapy to overcome MPA.

Section 2 – MPA therapies: Which therapies the participants have tried in order to overcome MPA, and how effective were they according to the participants’ experience.

Section 3 – MPA section: The participants’ experience with MPA, the factors connected to it and the physiological and mental states during the experience.

Section 4 – Flow section: The participants’ experience with flow, the factors connected to it and the physiological and mental states during the experience.

The full questionnaire can be found in Appendix I.

2.II. Questionnaire’s structure and comparison with standard questionnaires

Section 1 – Introductory questions

Section 1 is intended to gather both descriptive data about the participants (age, gender, years of experience as singers, level of musical education, country of residence, country of birth) and general details of their experience with MPA. Specifically, questions were asked regarding the use of the microphone (“Do you use the microphone when performing?”), the confidence felt when using the microphone (“How confident do you feel in using the microphone?”), the training received about amplification and microphone use (“During your studies as a performer, have you ever received structured training regarding the use of the microphone and general sound guidelines for amplified music performances?”), the writing of original material (“Do you write your own music and perform with it?”), the level of experienced everyday anxiety (“Would you describe yourself as an anxious person in everyday life?”) and whether the respondent ever tried any kind of therapy to overcome MPA.

Since I asked the participants to state their gender, and since previous studies found that females suffer from MPA more than males (Barlow, 2002; Çırakoğlu and Şentürk, 2013; Kenny, 2006, 2016; Kenny, Davis and Oates, 2004; LeBlanc *et al.*, 1997; Osborne and Franklin, 2002; Osborne and Kenny, 2008; Wesner, Noyes and Davis, 1990), I added a specific question for female participants regarding the connection between the occurrence of MPA and their menstrual cycle. Furthermore, I included a specific question regarding the attitude of the participants toward stress, based on the study of Keller *et. al.* (2012) (“Do you feel that stress is harmful to you and in order not to experience stage fright you should try to relax?”). I also added a question about the participants’ general experience with MPA (Figure 1). This question was added to the introductory section with the aim of introducing the participants to the main subject of the questionnaire, hoping this will enable them to recall their experiences with MPA and to give more genuine answers in the upcoming sections.

21. Which one of these sentences describes best your relationship with stage fright? *

Mark only one oval.

- When on stage I feel completely comfortable and I feel my best performances are those in front of a public
- I experience stage fright but, when I do, I still can perform, even if not at my best
- I am quite affected by stage fright, it bothers me during the performance
- I am very affected by stage fright and I feel that my singing in front of a public is always worse than during rehearsals
- I am the definition of "stage fright" the only idea of getting on stage paralyzes me with fear

Figure 1 - introductory question about MPA impact in the participants' general experience

Section 2 – MPA therapies

The section is intended only for those participants who answered “yes” to the introductory question asking whether they tried a therapy to overcome MPA. The most commonly suggested and used therapeutical approaches to MPA are listed: pharmacological treatment; psychotherapy; meditation; hypnotherapy; body relaxation treatments; cognitive - behavioral intervention; EMDR. For each therapy, the participants had to specify whether they tried it and how effective was it in helping them coping with MPA (“it didn’t help at all”; “it helped a little”; “it helped a lot”)

Section 3 (MPA) and section 4 (Flow)

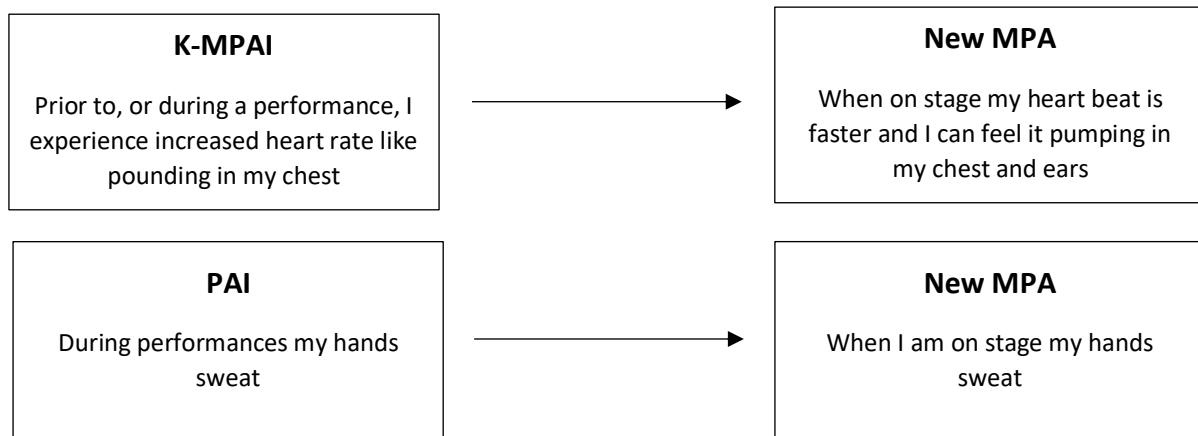
The questions of these two sections are formulated as statements (*e.g.*, “When I am on stage my mouth and throat are suddenly dry”) that the participants would have to rate based on their relevance for their experience, answering with a number on a scale from 1 to 5 (with 1 being “I don’t relate at all” and 5 being “I very much relate”). The questions enquire over mental, emotional and physical aspects related to their experience on stage.

The MPA section was partially based on chosen standard questionnaires. Since no standard questionnaire was designed to include the specific aspects I wanted to enquire about, I had to adapt these questionnaires to my research questions, thus rephrasing some of the questions, not using others and adding new questions to enquire about those aspects never researched, to my knowledge, by previous studies. I primarily drew inspiration from two different questionnaires: the Performance Anxiety Inventory (PAI) (Nagel, Himle and Papsdorf, 1989) and the Kenny Music Performance Anxiety Inventory (K-MPAI) (Kenny, Davis and Oates, 2004). Some of questions, especially those enquiring over physical reactions to arousal common to musicians, I kept almost as the original (Example 1).

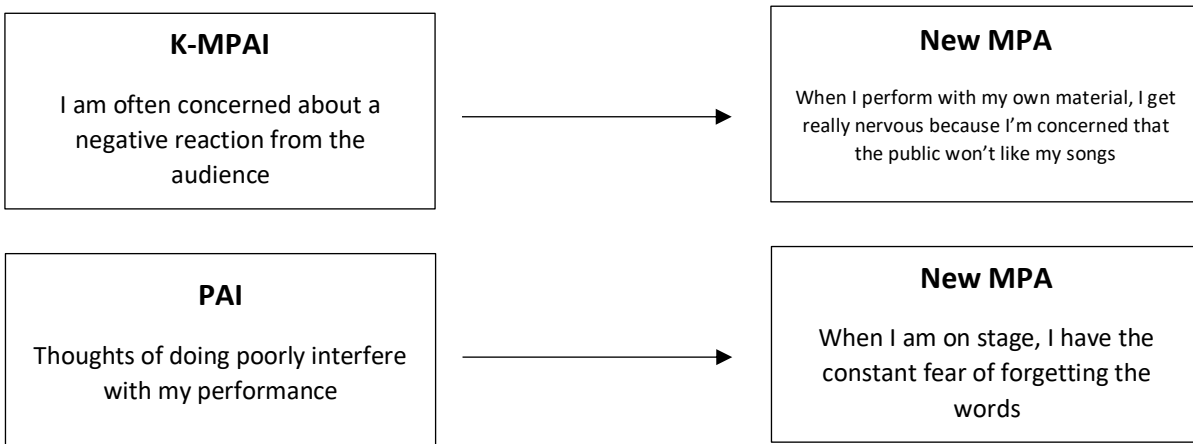
Other questions, were rephrased in order to adapt them to situations more relevant for popular music singer (Example 2).

Finally, some of the questions were intended to enquire about aspects specific to popular music singers (in particular the use of the microphone and amplification) that were never researched, to my knowledge, by previous studies, and that could not be based on any existing questionnaire (Example 3).

Conversely to the process of the development of the MPA section, the flow section of the questionnaire was not based on a standard questionnaire. While there are, in the field of music, questionnaires built to research MPA, no flow questionnaire was ever developed, to my knowledge, to research the experience of flow specifically in musicians.



Example 1 – examples of questions in the new MPA section kept as the original in PAI or K-MPAI questionnaires



Example 2: examples of questions in the new MPA section rephrased to make them relevant to popular music singers

New MPA

During amplified performances I can never hear myself properly, I feel there is too much noise on stage and my voice from the monitors sounds weird

New MPA

When on stage I feel the microphone is bothering me, and I never know what to do with my hands

Example 3 – examples of questions in the new MPA section that enquires about aspects specific to popular music singers

Since my goal was to research the effect of physical and mental arousal on a very specific category of musicians, I needed questions that the participants could relate to their own experience. Being the currently used flow questionnaires intended as general scales to be used with any population, I would have had to change and twist each question to adapt them to my needs, rendering the use of a standard questionnaire mute.

Instead, I created the flow section of the questionnaire basing myself on the MPA section. Since my goal was to verify whether the same somatic reactions to stress could be found in both MPA and flow experiences, some of the questions simply mirror those of the MPA section, enquiring over the same physical reactions (Example 4).

Other questions enquire over the connection between the experience of flow and aspects specific to popular music singers, such as performing with original material and the use of amplification (Example 5).



Example 4 – example of questions in MPA and flow sections enquiring over the same somatic reactions

Flow section

When on stage, my singing is effortless and the microphone helps me enhance my performance stage and my voice from the monitors sounds weird

Flow section

When I perform with my own material, I am very confident, because I know the public will love my songs, I believe my songs have a great musical value

Example 5 – example of questions verifying aspects specific to popular music singers in the flow experience

2.III. Distribution and descriptive statistics

The questionnaire was made available in English, Hebrew and Italian and was distributed in Israel, Italy, Germany, England, Ireland, United States and Canada through music schools' circles and social networks. The questionnaire got 169 responses. Five of the participants stated they were either not singers or only opera singers, and therefore could not complete the questionnaire. In **Table 1** the demographic characteristics of the remaining 164 participants are shown.

As can be seen, the large majority of the participants are female (75%)⁴ and most of them live in Israel (57.8%). The mean age is 28.92 years old (SD 10.72) and the large majority of the participants (86.0%) have above two years of experience as performers, with 37.8% of the participants reporting to have more than ten years' experience. The majority of the participants studied music formally but did not attain any academic title (48.8%) and a considerable percentage (29.3%) never studied music formally in a music institution, but only privately with private coaches and teachers. The participants split into two quite even groups between those who write their own music and perform with it (48.8%) and those who don't.

Table 2 shows the descriptive statistics of the MPA characteristics: daily anxiety, confidence in using of the microphone (Mic use), the training received on microphone and amplification (Mic training), correlation (for females only) between MPA occurrence and the menstrual cycle (menstrual cycle), level of experienced MPA (MPA), role of microphone in experienced MPA (Mic MPA) and MPA impact on the performance (MPA Impact on Performance). This last question (MPA Impact on Performance) was subdivided into three main levels (Low impact – answers 1 and 2; Medium impact – answer 3; High impact – answers 4 and 5). We grouped the three levels in order to have a some-what equal number of participants per category, which allowed us to run nominal tests with this variable.

As can be seen, the majority of the participants (67.7%) perform with the microphone either always or most of the times. At the same time, though, only 15.3% of the participants received a formal training about amplification and microphone use during their course of study. In the introductory questions the participants were also asked to report their attitude toward stress (*i.e.*, “do you believe that stress is bad for you and in order not to experience stage fright you should try to relax?” – Yes/No). The majority of the participants (68.9%) reported a negative attitude toward stress. Finally, there seems to be no correlation, according to the participants' experience, between the menstrual cycle and MPA occurrence: only 10.6% of the female participants reported they noticed higher levels of MPA when having their menstrual cycle, while the large majority (56.9%) reported that in their experience the menstrual cycle is not connected to MPA occurrence.

⁴ This bias toward more women responding to online questionnaires is not ideal but is a known problem often found in survey studies in general. There is no tell if this bias is also due to women being more interested in the topic of MPA than males, but since many previous studies have found that women do indeed suffer from higher levels of MPA, this speculation could be made.

Table 1 - sociodemographic characteristics (N=164)

		N	%
Gender	Male	41	25
	Female	123	75
Singer Type	Only pop	137	83.5
	Opera and pop	27	16.5
Residence Country	Israel	96	57.8
	Italy	53	31.9
	Other	15	10.3
Birth Country	Israel	79	47.6
	Italy	55	33.1
	Other	30	19.3
Music education*	Never studied formally	48	29.3
	Undergraduate	80	48.8
	BA	26	15.9
	MA	10	6.1
Years of experience on the stage	Less than 2	23	14
	Between 2 and 10	79	48.2
	More than 10	62	37.8
Original material	No	84	51.2
	Yes	80	48.8
Age	Mean (SD)		28.92 (10.72)

*What level of music education have you completed as of today? - I never studied music formally (private coaching); Undergraduate studies; BMus; Music MA; Music PhD

Table 2 - MPA characteristics (N=164)

		N	%
Mic Use	Never	6	3.7
	Rarely	6	3.7
	Sometimes	41	25
	Most of the times	59	36
	Always	52	31.7
Mic training	No	65	39.6
	Not formal	74	45.1
	Yes	25	15.3
Menstrual cycle	Irrelevant	11	8.9
	No	70	56.9
	Not sure	29	23.6
	Yes	13	10.6
Mic confidence (on a 1 to 5 scale)	Mean (SD)	3.37 (1.25)	
Daily anxiety (on a 1 to 5 scale)	Mean (SD)	2.95 (1.10)	
Experienced MPA (on a 1 to 5 scale)	Mean (SD)	2.68 (1.17)	
Mic effect on experienced MPA (on a 1 to 5 scale)	Mean (SD)	1.88 (1.15)	
Stress attitude (Negative/Positive)	Negative	113	68.9
	Positive	51	31.1
MPA impact on performance	High impact	31	18.9
	Medium impact	81	49.4
	Low impact	52	31.7

2.IV. Statistical Analyses

For the statistical analysis of the questionnaire's data, I contacted statistics counselor Shir Lerner (Hebrew University of Jerusalem). We used independent T-tests, Chi-square, Spearman and Pearson correlations in order to address the correlations and connections among all of the study's variables. We used multiple regression analysis in order to predict MPA and flow experiences with all of the relevant study's variables as predictors. The statistical analyses were run on a SPSS-25 software.

3. Results

The results are presented in this chapter subdivided as follows: I. statistical analysis II. correlation tests and III. multiple regression analysis

3.I. Statistical Analysis

I report in **Table 3** the descriptive statistics and reliability index (alpha Cronbach) for the MPA and flow sections of the questionnaire. The full results for the reliability index of each item can be found in Appendix II.

Table 3 - Mean, standard deviation (SD), range of lower and higher participants' score, and alpha Cronbach for MPA and flow sections of the questionnaire (N=164).

	Mean	SD	Range	α
MPA	2.27	.72	(1-4.40)	.863
Flow	2.89	.73	(1.18-4.45)	.795

I investigated the factor of therapy treatment for MPA. Out of the 164 participants, 22 (13.4%) have tried some kind of therapy to treat MPA. The most commonly reported therapy is meditation (N=14), and the therapies reported as more effective are pharmacological therapy (beta-blockers), psychotherapy and meditation, while the therapies reported as less effective are hypnotherapy and EMDR. We confronted the reported MPA and flow levels between participants who have tried some kind of therapy to overcome MPA, and those who never tried any kind of therapy. To investigate the correlation, we ran an independent sample *t*-test (**Table 4**).

Participants who tried some kind of therapy to treat their MPA, report significantly higher MPA than those that didn't try therapy. More interestingly, those who tried some kind of therapy, report experiencing significantly less flow than participants who did not try some kind of therapy. We then tested the hypothesis that those who write their own music and perform with it, might suffer from higher levels of MPA, since they would have an additional factor contributing to the anxiety build-up toward a performance (**Table 5**).

Table 4 - Therapy (Yes vs. No) compared to reported levels of MPA and Flow

	No therapy (N=142)		Therapy (N=22)		t value
	M	SD	M	SD	
MPA	2.19	.70	2.76	.68	3.53**
Flow	2.94	.73	2.61	.63	2.01*

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

Table 5 - Original material (Yes vs. No) compared to reported levels of MPA and Flow

	Original material (N=80)		No original material (N=84)		t value
	M	SD	M	SD	
MPA	2.51	1.15	2.85	1.16	3.53**
Flow	3.07	.74	2.73	.72	2.02*

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

Table 6 – MPA, Flow and Daily Anxiety levels related to Gender

	Female (N=123)		Male (N=41)		t value
	M	SD	M	SD	
MPA	2.79	1.21	2.37	.99	2.02*
Flow	2.87	.76	2.95	.65	.78
Daily Anxiety	3.06	1.18	2.61	.99	2.27*

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

Interestingly, the obtained results not only reject the initial hypothesis, but even suggest the opposite: participants who write their own music and perform with it, report significantly less experienced MPA than those that don't write their own original music. Moreover, they report significantly higher levels of flow than participants who don't write and perform with original music.

Given previous studies' results suggesting a relationship between gender and levels of experienced MPA and of experienced daily anxiety, we ran an independent sample *t*-test to

investigate the relationship between gender, levels of MPA, levels of flow and levels of daily anxiety (Table 6).

As can be seen in Table 6, females report significantly higher levels of MPA and daily anxiety than males, while no significant correlation was found between gender and levels of experienced flow.

3.II. Correlation tests and significance quantifications

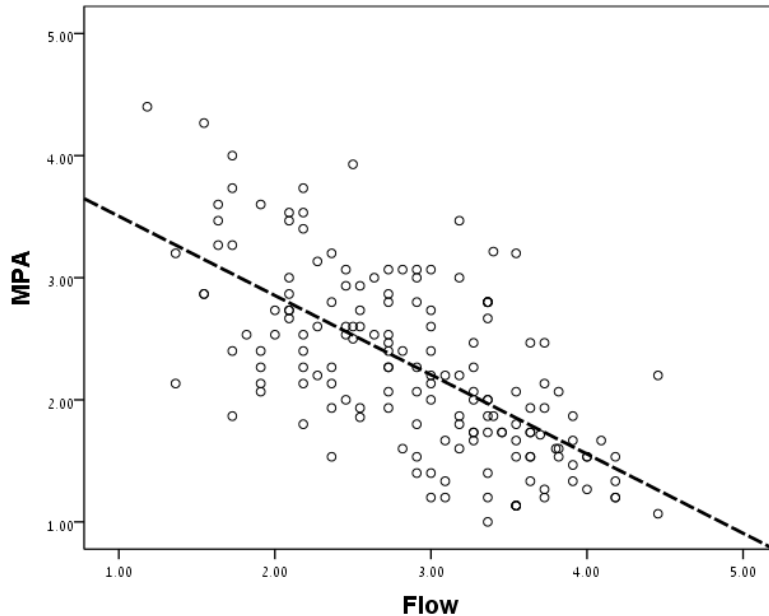


Figure 2 - Scatter plot for the connection between MPA and flow ($y=3.56-0.65x$)

I investigated whether the results of the new questionnaire would show the negative correlation between MPA and flow found by previous studies. In order to address the correlation between MPA and flow sections, we conducted a Pearson correlation test.

Consistent with my hypothesis and with the findings of previous studies, there is a significant negative correlation between MPA and flow ($r=-.65$, $p<.01$) as seen in **Figure 2**.

We then performed correlations tests between the experienced MPA and flow and the parameters I hypothesized would play a role in the occurrence of MPA and flow, namely confidence in the use of the microphone, training in microphone use, level of music education, years of experience (Table 7).

Reported MPA levels were significantly negatively correlated to confidence in the use of the microphone, level of music education, and years of experience, and significantly positively correlated to daily anxiety levels; training in the use of microphone resulted not significantly correlated to MPA. Reported flow levels were significantly positively correlated to level of confidence in the use of the microphone, level of music education, level of formal training on microphone use and years of experience and significantly negatively correlated to daily anxiety levels.

Table 7 - Spearman rho correlations between MPA, flow and confidence in the use of the microphone (Mic confidence), training in microphone use (Mic training), level of music education (Music Education), Years of Experience

	MPA	Flow
Daily Anxiety	.40**	-.32**
Mic confidence	-.38**	.36**
Mic training	-.07	.21*
Music education	-.18*	.32**
Years of experience	-.26**	.38**

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

Table 8 - MPA impact on performance (N=164)

MPA impact on performance*	High impact	31	18.9%
	Medium impact	81	49.4%
	Low impact	52	31.7%

*MPA impact categorized into three main levels based on the answers to the question in Figure 1 (Low impact: answers 1 and 2; Medium impact: answer 3; High impact: answers 4 and 5)

Table 9 - chi-square test for relationship between MPA impact and stress attitude

	Positive stress attitude	Negative stress attitude
High impact	12.9%	87.1%
Medium impact	27.2%	72.8%
Low impact	48.1%	51.9%

($\chi^2_{(2)}=12.37, p < .01$)

I hypothesized that the impact of MPA on the performance would be related to the performer's attitude toward stress. We subdivided the levels of MPA impact into three main levels (high impact, medium impact and low impact) based on the participants' answers (Low impact: answers 1 and 2; Medium impact: answer 3; High impact: answers 4 and 5) in order to have three categories relatively even in numbers to use as nominal variable. Then, using chi-square test, we quantified the statistical significance of the relation between these levels of MPA impact on the performance and the participants' attitude toward stress (Negative/Positive).

As shown in **Table 9**, there is a significant relation between the two. Of the 18.9% of the participants that report experiencing a high MPA impact on their performance (**Table 8**), 87.1% report a negative attitude toward stress (*i.e.*, they believe that stress is bad for them and in order not to experience MPA they should try to relax), and only 12.9% report having a positive attitude towards stress (**Table 9**). Conversely, of those participants reporting a medium (49.4%) or low (31.7%) MPA impact, a significantly lower percentage report a negative stress attitude (72.8% and 51.9% respectively). (**Table 8**; **Table 9**).

I also hypothesized that the levels of reported daily anxiety would be connected to the participants' attitude toward stress. We therefore subdivided the levels of reported daily anxiety into three main categories (Low daily anxiety: answers 1 and 2; Medium daily anxiety: answer 3; High daily anxiety: answers 4 and 5) and ran a chi-square test to quantify the statistical significance of the relationship with the participants' stress attitude (Negative/Positive, **Error! Not a valid bookmark self-reference.**).

Table 10 - chi-square test for connection between daily anxiety and stress attitude

	Positive stress attitude	Negative stress attitude
High daily anxiety	23.6%	76.4%
Medium daily anxiety	27.5%	72.5%
Low daily anxiety	47.5%	52.5%

($\chi^2_{(2)}=6.86, p<.05$)

The results show that there is a significant relationship between the levels of reported daily anxiety and the participants' attitude toward stress. Of the participants who report medium or high levels of daily anxiety, 76.4% and 72.5%, respectively, report a negative attitude toward stress. Of those reporting low levels of daily anxiety, a much lower percentage (52.2%) report they believe stress is bad for them.

3.III. Multiple regression analysis

Lastly, we built two multiple linear regression models to investigate the relative contribution of the above explored parameters (confidence in the use of the microphone, training in the use of the microphone, years of experience, original material, daily anxiety, attitude toward stress, use of therapy) in explaining both MPA and flow (**Table 11**). The multilinear model for MPA explains 36.4% of the observed variance and is significant in explaining MPA ($F(7,156)=12.77, p<.01$). Specifically, the most important explanatory variables are: mic confidence (negative correlation, $\beta=-0.28$), attitude toward stress (positive, $\beta=0.27$), reported daily anxiety (positive, $\beta=0.24$), use of therapy (positive, $\beta=0.20$), years of experience (negative, $\beta=-0.15$). Training in the use of microphone and performing original material are not significant explanatory variables for MPA. The multilinear model for flow explains 34.4% of the observed variance and is significant in explaining flow ($F(7,156)=11.68, p<.01$). The most important explanatory variables are: years of experience (positive correlation, $\beta=0.26$), attitude toward stress (negative, $\beta=-0.20$), confidence in the use of the microphone (positive, $\beta=0.18$), daily anxiety (negative, $\beta=-0.17$), training in use of the microphone (positive, $\beta=0.14$) and performing original material (positive, $\beta=0.13$). The use of some kind of MPA therapy on the participant's part, is not a significant explanatory variable for flow.

Table 11 - multiple regression analysis

Predicted var.	predictors	beta	p-value
MPA	mic confidence	-.28	<.01
	mic training	.02	.67
	years of experience	-.15	.02
	original material	-.02	.68
	daily anxiety	.24	<.01
	stress attitude	.27	<.01
	therapy	.20	<.01
	Total model	$R^2=0.364^{**}$	
Flow experience	mic confidence	.18	<.01
	mic training	.14	.03
	years of experience	.26	<.01
	original material	.13	.03
	daily anxiety	-.17	.01
	stress attitude	-.20	<.01
	therapy	-.12	.06
	Total model	$R^2=0.344^{**}$	

** $p<.01$

4. Discussion

The first goal of this study was to validate the new questionnaire specifically developed to research MPA and flow in popular music singers. As shown in **Table 3**, the reliability scores of the two sections of the questionnaire about experienced MPA and flow are proven to be high (.863 for the MPA section and .795 for the flow section, meaning that only 13.7% and 20.5%, respectively, of the observed variance is imputable to errors of measurement). This high score is particularly significant considering that the questions deal, for the most part, with parameters specific to popular music singers that, to my knowledge, were never investigated before (the use of the lyrics, the use of microphone and amplification, the element of performing with original material, physical reactions to arousal connected to the throat, mouth and larynx). Given the high score of the two sections' reliability, the new questionnaire on MPA and flow in popular music singers is to be considered valid for investigating these topics.

The second goal was to investigate, based on the questionnaire's results, the relation between flow, MPA and parameters investigated by previous studies.

The results show a significant negative correlation between MPA and flow ($r=-.65$, $p<.01$, **Figure 2**), thus confirming results from previous studies (Cohen and Bodner, 2018; Kenny, 2006; Landhäußer and Keller, 2012; Schiepe-Tiska and Engeser, 2012; Simoens, Puttonen and Tervaniemi, 2015; Wolfe, 1989).

I was able to replicate results of previous studies (Barlow, 2002; Çırakoğlu and Şentürk, 2013; Kenny, 2006, 2016; Kenny, Davis and Oates, 2004; LeBlanc *et al.*, 1997; Osborne and Franklin, 2002; Osborne and Kenny, 2008; Wesner, Noyes and Davis, 1990) that showed that female participants appear to experience significantly higher levels of both every-day anxiety and MPA (**Table 6**), and that people who report higher levels of general daily anxiety, also report higher levels of experienced MPA (Cox and Kenardy, 1993; Gorges, Alpers and Pauli, 2007; Osborne and Franklin, 2002; Osborne and Kenny, 2008; Salmon, 1990; Wesner, Noyes and Davis, 1990) (**Table 7**). Additionally, participants reporting high levels of general anxiety also report lower levels of experienced flow (**Table 7**).

Furthermore, the results suggest that higher levels of music education and higher number of years of experience are related to lower experienced MPA levels (**Table 7**). Regarding the years of experience, this observation challenges previous findings showing that the number of the performer's years of experience does not play a statistically significant role in MPA occurrence in musicians (Brooker, 2015; Cox and Kenardy, 1993; Kenny, 2004; Kenny, Davis and Oates, 2004; Osborne, Kenny and Holsomback, 2005; Zakaria, Musib and Shariff, 2013); however, it should be noted that this does not necessarily mean that popular music singers are different, on this perspective, from instrumentalists, because possible differences in the interviewed populations should be considered (*e.g.* age distribution). Additionally, it should be noted that the examined variables are not statistically independent (experience with the microphone, which is found to be the most important explanatory variable for MPA, is likely positively correlated with the years of experience). It is also worth noting that there is a minority of studies that did find the number

of years of experience as statistically significant in the occurrence of MPA (Ryan and Andrews, 2009).

From the introductory question regarding the participants' attitude toward stress ("Do you feel that stress is bad for you and in order not to experience stage you should try to relax?") emerged that the majority of the participants (68.9%) believes that stress is bad for them and that they should try to avoid it (**Table 2**). Interestingly, the percentage was reduced by the Italian questionnaires, where only 45.3% of the participants reported a negative attitude toward stress. In the English and Hebrew questionnaires, the percentage of those reporting to believe that stress is bad for them was much higher (85.2% and 78.6%, respectively). It is difficult to speculate why these percentages variate in such significant way between the populations, but it could be interesting to check whether the attitude toward stress in musicians is cultural-related.

We also found a significant relationship between the participants' attitude toward stress and both MPA impact on the performance (**Table 9**) and general anxiety levels (**Table 11**). These results support our hypothesis, also suggested by previous studies (Cohen and Bodner, 2018; Keller *et al.*, 2012; McGonigal, 2015; Osborne and Kenny, 2008; Simoens, Puttonen and Tervaniemi, 2015; Studer *et al.*, 2011), that the performer's belief that stress is bad for them and that they should try to avoid it, might play a role in the performer's anxiety levels in everyday life and MPA occurrence levels, and could therefore be actually harmful in the performer's attempt to overcome MPA.

Our results also showed a correlation between the seek for therapy treatment and the occurrence of MPA (**Table 4**) confirming results from previous studies (Kenny, Davis and Oates, 2004; Studer *et al.*, 2011). This was somewhat expected, as performers who suffer more from MPA would presumably seek therapy help more often than performers who suffer less from MPA. Additionally, therapy treatment was also negatively correlated to flow experience, meaning that those who tried to treat MPA with some kind of therapy not only report higher levels of MPA, but also report experiencing less flow.

As for the third goal of this study, the questionnaire allowed me to investigate the relation between the occurrence of MPA and flow and aspects specific to the popular music singers' experience never investigated by previous studies.

In the MPA section (Appendix 1), some of the questions enquired about very specific stress-related issues that might be relevant for singers in general or for popular music singers in particular, such as: physical reactions to stress (*i.e.*, hands sweating; dry mouth; sore throat; heart pumping in the ears), fear of forgetting the lyrics, issues with microphone use and amplification use (*i.e.*, not hearing oneself through the monitors; feeling the microphone distorts one's voice instead of enhancing its qualities; etc.). The issues that emerged as most relevant in the participants' experience are the fear of forgetting the words (44.5% answered 4 or 5) and hearing one's heart pump in one's ears (31.7% answered 4 or 5). Dry mouth and throat, issues in hearing oneself through the monitor and in using the microphone correctly and having sweaty hands also emerged as quite relevant (25%, 21.9% and 20.1% answered 4 or 5, respectively). The fear related to performing with one's original music and having a sore throat when waking up the day of a performance emerged as less critical but still relevant aspects (17.6% and 15.8% answered 4 or 5 respectively).

The performer's confidence in the use of the microphone is particularly noteworthy. The level of confidence in the use of the microphone and amplification, never (to my knowledge) previously

considered by research, resulted being the most significant parameter in the MPA prediction model, and one of the most significant for flow experience (**Table 11**). It also resulted as significant as daily anxiety in the correlation with MPA and even more significant than daily anxiety in the correlation with flow (**Table 7**). The significance of this parameter is even more notable, given that only 15.3% of the participants report to have been given a proper training on microphone use and amplification in their course of studies (**Table 2**). The rest of the participants report having received some informal advices on the matter by teachers on their own initiative (45.1%) or not having received any training whatsoever on this subject (39.6%). Considering that 70.8% of the participants did study music formally inside music schools and institutions (**Table 1**), this suggest that music institutions' programs lack this kind of training for their pupils in vocal departments. While I was expecting performing with original material to be an additional factor that might cause MPA occurrence, the results disproved my hypothesis and, even more interestingly, suggested an opposite correlation: participants who write original music and perform with it not only experience lower levels of MPA, but also experience higher levels of flow (**Table 5**). This result is particularly interesting, but since no previous study, to my knowledge, ever investigated MPA and flow levels in singer-songwriters, it is hard to speculate over what might cause this relation. One possible explanation could be the assumption that musicians (not only singers) that write their own music and perform with it, are more confident of their talent. From my personal experience as singer and song-writer, I learned that many musicians do write their own music, but not all of them feel confident enough to perform with it. It is not uncommon to meet accomplished musicians, who have no issue in performing in front of an audience and are aware of their talent as singers or instrumentalists that, at the same time, are very uncomfortable in performing with their own material: when it comes to their original music, their confidence shatters. On the other hand, musicians that do feel confident performing with their own music, never miss a chance to do so, and often feel that their original material is what represents them at best as artists. A situation that might cause anxiety to others (performing in front of an audience with original music), is for them the optimal occasion in which they can express their musicianship and artistic relevance. This observation is based solely on personal observation. It might be interesting to develop a study to investigate this specific aspect, for example confronting general anxiety, MPA and flow levels in musicians who write their own music but don't perform with it, and in musicians who write their own music and perform with it. On this same matter, it is interesting to realize that, although we are used to think about classical music as a genre with a fixed repertoire that the audience is already familiar with, not so long-ago composers such as Beethoven, Chopin, Rachmaninoff, or Liszt, who used to both compose and perform with their own compositions, could have probably shared the same emotional and career challenges as now-adays song-writers. Furthermore, musicians who make large use of improvisation in their music (*e.g.*, jazz singers and instrumentalists) face a similar and yet different challenge, as they compose and perform at the same time. It might be interesting to investigate whether this category of musicians' attitude towards their improvised compositions is similar to that of song-writers, and whether they experience different levels of MPA and flow when performing with and without improvising. Finally, multiple regression analysis (**Table 11**), allowed us to build a model for significantly explaining both MPA and flow (respectively, 36.4% and 34.4% of explained variance). This model shows that a lower level of MPA occurrence in the performer's experience can be partly

associated to the following factors: higher level of the performer's confidence in the use of the microphone; higher number of years of experience; positive attitude toward stress. Furthermore, a higher level of the performer's experienced flow can be partly associated to the following factors: higher number of years of experience; higher level of confidence in the use of the microphone; higher level of training received on the use of the microphone; positive attitude toward stress; lower levels of experienced daily anxiety; writing of and performing with original material.

4.1. Caveats

Three aspects of this study are, to my view, still open to possible improvement. The first aspect I would like to address is the participants' population. This study was originally thought to be directed mostly to a population of young singers, preferably students and pupils. With this purpose, a various number of music schools, music academies and private singing teachers were contacted to spread the questionnaire among the selected population. Unfortunately, the response from the music institutions was almost null. More collaboration was found within the circles of private singing teachers, that could involve their own pupils. Still, in the end, the majority of participants did not come from music institutions or private classes, but from social media communities of fellow singers and colleagues. This led to the study's population being mainly formed by experienced professionals, rather than students and young singers at the beginning of their carriers. Therefore, the first improvement I would propose for the future, is to run this study on a larger population, more balanced in terms of gender, formed mainly of students, maybe in collaboration with a few music schools and academies.

Secondly, two sub-categories of the popular music singers' population are, in my opinion, worthy of being studied with a closer focus: singers that also play an instrument, accompanying themselves while singing, and singers that sing both classical and popular music. Both these groups deal not only with the factors that are specific to the population this study focused on, but also with factors generally un-related to the experience of popular music singer, such as the element of the external instrument, that belongs to the instrumentalists' experience, or the need to compete with colleagues on the same exact repertoire, common in the opera singers' experience.

Finally, a deeper focus should be dedicated to the therapies currently in use to treat MPA. This study focused on the therapies generally suggested to performers that deal with MPA, but musicians have always had their own therapeutical habits to deal with the problem. Alcohol and drugs are certainly not suggested by physicians, but they are largely used by performers: how does their use change the performer's attitude toward MPA? Furthermore, each singer has their own beverage or food to be avoided or to be ingested to ensure a remarkable performance. Are these habits mere placebos, or is there an actual somatic reaction to certain foods that might have effects on the occurrence (or avoidance) of MPA experiences?

Additionally, a comparison of the new questionnaire with the standard MPA and flow questionnaires available could be implemented. A study could be developed with a larger sample of popular music singers as participants, sub-divided into two groups: one group's experience would be investigated using standard questionnaires for flow and MPA measuring, and the

second group's experience would be investigated using the new questionnaire for popular music singers.

5. Outlook and future directions

In light of the results obtained in the study, I can now start paving the way toward my overarching objective, that is to propose a new approach to MPA based on practical aspects specific to popular music singers, the role of teachers and music institutions, and the use of flow as a tool to overcome MPA. The new method I propose has been already used on several vocal students suffering from MPA (mainly adolescents, ages 13 to 18) over a span of three years of time. I envision the new method should be structured with the collaboration of colleagues from the psychology and education fields, in order for others to be able to put it into practice. I will however list here the focal points I believe the method should be built around:

a. Practical tools specific to the musician's instrument

This study showed once more how complex and stratified the issue of MPA is. It also showed how practical and concrete aspects specific to the performer's instrument play a role in the experience. The therapy used to face the problem should therefore take under consideration those very same aspects. In the case of popular music singers, I would suggest the therapeutical method to include insights on breathing, larynx anatomy, vocal hygiene, use of the lyrics, writing of original material, engagement of the audience and use of the microphone and amplification. This study shows that even though the level of confidence in the use of the microphone plays a significant role in the occurrence of MPA, only a very small percentage of music students receive a formal education on microphone use and amplification. It is crucial that singing students are enabled to build their confidence in the use of amplification by focused training on the matter, especially in the early years of their music education. I would recommend that music education institutions, especially high schools and undergrad schools, hold classes on the matter. These classes should be held by singers and be specifically designed for singers, and singing teachers should be themselves trained on the subject.

b. The role of teachers and music education institutions

In the new method, the role of the singing teachers is crucial. As previous studies show, only a small percentage of students who suffer from MPA seek help from physicians and specialized therapist (Nideffer and Hessler, 1978; Osborne and Kenny, 2008; Shaw, Juncos and Winter, 2020; Studer *et al.*, 2011; Zakaria, Musib and Shariff, 2013). The large majority of the students turns first of all to their teachers. It is therefore crucial that the teacher is prepared on the subject of MPA, and that music institutions hold classes on the subject. My aim with the current study and with my future research is to contribute in giving fellow vocal coaches practical tools to use with their own students.

c. The concept of flow and the channeling of stress

The new method is centered in a better channeling of the arousal building up toward a performance. The results replicated the finding of a negative correlation between MPA and flow already reported by previous studies (Cohen and Bodner, 2018), and support the theory that while the two phenomena are antithetical in the experience of the performer, they are both

connected to arousal, with very similar somatic reactions (Alpert and Haber, 1960; Cohen and Bodner, 2018; Kenny, 2006; Kenny and Osborne, 2006; Osborne and Kenny, 2008; Simoens, Puttonen and Tervaniemi, 2015; Spahn, 2015; Spahn *et al.*, 2010; Wolfe, 1989). Furthermore, the results show a positive correlation between a negative attitude of the participants toward stress (*i.e.*, the performer thinks that stress is bad for them and in order not to experience MPA they should try to relax) and the occurrence of MPA, and a positive correlation between a positive attitude toward stress and the occurrence of flow. These results support previous studies that show that the attitude toward stress is no less significant in the participants' experience than the actual level of stress reported (Keller *et al.*, 2012; McGonigal, 2015), and how with a cognitive action the performer can channel the physiological arousal that might lead to a negative experience (MPA) into a positive experience (flow) (Csíkszentmihályi, 1990; Schachter and Singer, 1962; Simoens, Puttonen and Tervaniemi, 2015). If the enhancement of flow could be a powerful tool to overcome MPA (Cohen and Bodner, 2018; Keller *et al.*, 2012; Kenny, 2006; Kenny and Osborne, 2006; Landhäußer and Keller, 2012; Simoens, Puttonen and Tervaniemi, 2015), and if flow is based on arousal (Alpert and Haber, 1960; Csíkszentmihályi, 1990; Wolfe, 1989), why should the performer be trained to relax and avoid stress and arousal? The method I would like to propose focuses on the channeling of stress and physical arousal rather than on relaxing. The student is taught to re-think the whole concept of stress and to live the somatic reactions to arousal (*i.e.*, increasing heart rate, high blood pressure, high adrenalin levels, overheating, sweating, trembling, dry mouth, etc.) not as weaknesses that will lead to a failure, but as signs that their body and mind are preparing to meet the challenge ahead. With this aim I developed a series of physical and mental exercises my students can practice during their course of studies and before their performances. These exercises include physical and vocal warm ups designed to build up adrenaline (running, jumping, shouting, punching and kicking), breathing exercises to gain control of one's heart rate and guided meditation to enable a state of mind that will allow the performer to embrace the physical and emotional effects of stress and to feel enabled and empowered. The goal of these exercises is to build physical, emotional and mental arousal that the performers can feel are in their control, so that they can channel it into a positive experience when on stage. I also developed a series of "emergency" physical and mental exercises the teacher can implement if the students experience high levels of anxiety or panic right before going on stage, so that the student can gain back their mental and emotional balance. During the whole process the students are invited to re-shape the whole concept of stress and to embrace it as a powerful tool to enhance their performance and stage presence as artists.

6. Conclusions

This study results show once more how complicated of an issue dealing with MPA is, with multiple, inter-dependent factors playing different roles in the experience of the performer. I was able to shed new light on the specific needs of an under-studied category of musicians such as popular music singers, and to show the possible advantages there are in a therapeutical approach based on those specific needs. I was also able to contribute to the research of the relation between MPA and flow, and to confirm once more the key role flow could play in the therapeutical approach to deal with MPA. Finally, this study's results allowed me to move forward in the theorization and structuralization of a method that will hopefully be soon available for other fellow teachers and students to use.

Bibliography

1. Alpert, R. and Haber, R. N. (1960) 'Anxiety in academic achievement situations', *The Journal of Abnormal and Social Psychology*, 62(2), pp. 207–215. doi: <https://doi.org/10.1037/h0045464>.
2. Ascenso, S., Williamon, A. and Perkins, R. (2016) 'Understanding the wellbeing of professional musicians through the lens of Positive Psychology', *Psychology of Music*, pp. 1–17. doi: 10.1177/0305735616646864.
3. Barbeau, A. K. (2011) *Performance Anxiety Inventory for Musicians (PerfAIM): A New Questionnaire to Assess Music Performance Anxiety in Popular Musicians*. McGill University.
4. Barlow, D. H. (2002) *Anxiety and Its Disorders: The Nature and Treatment of Anxiety and Panic*. 2nd edn, *American Journal of Psychiatry*. 2nd edn. New York: The Guilford Press New. doi: 10.1176/appi.ajp.159.8.1453.
5. Brodsky, W. (1996) 'Music Performance Anxiety Reconceptualized: A Critique of Current Research Practices and Findings', *Medical Problems of Performing Artists*, 11(3), pp. 88–98.
6. Brooker, M. E. (2015) *Music Performance Anxiety : An Investigation into the Efficacy of Cognitive Hypnotherapy and Eye Movement Desensitisation and Reprocessing when applied to Grade 8 Pianists*. The University of Leeds School of Music.
7. Burwell, K. (2006) 'On musicians and singers. An investigation of different approaches taken by vocal and instrumental teachers in higher education', *Music Education Research*, 8(3), pp. 331–347. doi: 10.1080/14613800600957479.
8. Çırakoğlu, O. C. and Şentürk, G. C. (2013) 'Development of a Performance Anxiety Scale for Music Students', *Medical Problems of Performing Artists*, 28(4), pp. 199–206.
9. Cohen, S. and Bodner, E. (2018) 'The relationship between flow and music performance anxiety amongst professional classical orchestral musicians', *Psychology of Music*, pp. 1–16. doi: 10.1177/0305735618754689.
10. Cohen, S. and Bodner, E. (2019) 'Flow and music performance anxiety: The influence of contextual and background variables', *Musicae Scientiae*, pp. 1–20. doi: 10.1177/1029864919838600.
11. Cox, W. J. and Kenardy, J. (1993) 'Performance Anxiety, Social Phobia, and Setting Effects in Instrumental Music Students', *Journal of Anxiety Disorders*, 7(1), pp. 49–60. doi: 10.1016/0887-6185(93)90020-L.
12. Csikszentmihályi, M. (1990) *Flow: The Psychology of Optimal Experience*, Harper and Row. New York: Harper and Row. doi: 10.5465/amr.1991.4279513.
13. Erdemir, A. and Rieser, J. J. (2016) 'Singing without hearing: The use of auditory and motor information when singers, instrumentalists, and nonmusicians sing a familiar tune', *Music Perception*, 33(5), pp. 546–560. doi: 10.1525/MP.2016.33.5.546.
14. de Figueiredo Rocha, S. (2020) 'Musical Performance Anxiety (MPA)', *IntechOpen*, (March). doi: 10.5772/intechopen.91646.
15. Fishbein, M. et al. (1988) 'Medical problems among ICSOM musicians Fishbein.pdf', *Medical Problems of Performing Artists*, 3(March), pp. 1–8.
16. Forbes, M. (2020) 'Giving voice to jazz singers' experiences of flow in improvisation', *Psychology of Music*, (February). doi: doi.org/10.1177/0305735619899137.
17. Foulds-Elliott, S. D. et al. (2000) 'Respiratory function in operatic singing: Effects of emotional connection', *Logopedics Phoniatrics Vocology*, 25(4), pp. 151–168. doi: 10.1080/140154300750067539.
18. Frič, M. and Podzimková, I. (2021) 'Comparison of sound radiation between classical and pop singers', *Biomedical Signal Processing and Control*, 66(February). doi:

- 10.1016/j.bspc.2021.102426.
19. Gerhard, J. *et al.* (2018) 'The Role of Observation and Mentorship in Voice Pedagogy Training', *Journal of Voice*, 34(1), pp. 160.e1-160.e6. doi: 10.1016/j.jvoice.2018.09.014.
 20. Gorges, S., Alpers, G. W. and Pauli, P. (2007) 'Musical performance anxiety as a form of social anxiety?', *International Symposium on Performance Science 2007*.
 21. Jackson, S. A. *et al.* (2001) 'Relationships between Flow, Self-Concept, Psychological Skills, and Performance', *Journal of Applied Sport Psychology*, (13), pp. 129–153. doi: 10.1080/104132001753149865.
 22. Jackson, S. A., Eklund, R. C. and Martin, A. J. (2010) *The FLOW Manual - The Manual for the Flow Scales*, Mind Garden.
 23. Jackson, S. A. and Marsh, H. W. (1996) 'Development and Validation of a Scale to Measure Optimal Experience: The Flow State Scale', *Journal of Sport and Exercise Psychology*, 18(1), pp. 17–35. doi: 10.1123/jsep.18.1.17.
 24. Jackson, S. A., Martin, A. J. and Eklund, R. C. (2008) 'Long and Short Measures of Flow: Examining Construct Validity of the FSS-2, DFS-2, and New Brief Counterparts.', *Journal of sport & exercise psychology*, (30), pp. 561–87.
 25. Jackson, S. A. and Robert, E. C. (2002) 'Assessing Flow in Physical Activity: The Flow State Scale-2 and Dispositional Flow Scale-2', *Journal of Sport and Exercise Psychology*, (24), pp. 133–150.
 26. Jaros, M. D. (2008) *Optimal experience in the choral rehearsal: A study of flow and affect among singers*. University of Minnesota.
 27. Kawabata, M., Mallett, C. J. and Jackson, S. A. (2008) 'The Flow State Scale-2 and Dispositional Flow Scale-2: Examination of factorial validity and reliability for Japanese adults', *Psychology of Sport and Exercise*, 9(4), pp. 465–485. doi: 10.1016/j.psychsport.2007.05.005.
 28. Keller, A. *et al.* (2012) 'Does the perception that stress affects health matter? The association with health and mortality', *Health Psychology*, 31(5), pp. 677–684. doi: 10.1037/a0026743.
 29. Kenny, D. T. (2004) 'Treatment approaches for music performance anxiety: What works?', *Music Forum*, 10(4), pp. 38–43.
 30. Kenny, D. T. (2006) 'Music Performance Anxiety: Origins, Phenomenology, Assessment and Treatment', *Context*, 31(January), pp. 51–64.
 31. Kenny, D. T. (2011) *The Psychology of Music Performance Anxiety*, Oxford University Press. New York: Oxford University Press. doi: 10.1093/acprof.
 32. Kenny, D. T. (2016) *Music performance anxiety: Theory, assessment and treatment*, LAP Lambert.
 33. Kenny, D. T., Davis, P. and Oates, J. (2004) 'Music Performance Anxiety and Occupational Stress Amongst Opera Chorus Artists and Their Relationship With State and Trait Anxiety and Perfectionism', *Journal of Anxiety Disorders*, 18(6), pp. 757–777. doi: 10.1016/j.janxdis.2003.09.004.
 34. Kenny, D. T. and Osborne, M. S. (2006) 'Music performance anxiety: New insights from young musicians', *Advances in Cognitive Psychology*, 2(2–3), pp. 103–112. doi: 10.2478/v10053-008-0049-5.
 35. Kob, M. *et al.* (2011) 'Analysing and Understanding the Singing Voice: Recent Progress and Open Questions', *Current Bioinformatics*, 6(3), pp. 362–374. doi: 10.2174/157489311796904709.
 36. Ladano, K. (2016) 'Free improvisation and performance anxiety in musicians', *Improvisation and Music Education*, (4), pp. 46–59. doi: 10.4324/9781315737393.
 37. Landhäuser, A. and Keller, J. (2012) 'Flow and Its Affective, Cognitive, and Performance-Related Consequences', in Engeser, S. (ed.) *Advances in Flow Research*. LLC: Springer Science+Business Media, pp. 65–85. doi: 10.1007/978-1-4614-2359-1.
 38. LeBlanc, A. *et al.* (1997) 'Effect of Audience on Music Performance Anxiety', *Journal of Research*

- in Music Education*, 45(3), pp. 480–496. doi: 10.2307/3345541.
39. Manning, A. L. (2013) *Instrument-Specific Music Performance Anxiety*. University of Southern Mississippi.
 40. Marshall, A. J. (2008) *Perspectives About Musicians' Performance Anxiety*. University of Pretoria.
 41. Matei, R. and Ginsborg, J. (2017) 'Music performance anxiety in classical musicians – what we know about what works', *BJPsych. International*, 14(2), pp. 33–35. doi: 10.1192/s2056474000001744.
 42. McGonigal, K. (2015) *The Upside of Stress: Why Stress Is Good for You, and How to Get Good at It*, New York: Avery. New York.
 43. Nagel, J. J., Himle, D. P. and Papsdorf, J. D. (1989) 'Cognitive-Behavioural Treatment of Musical Performance Anxiety', *Psychology of Music*, pp. 12–21. doi: 10.1177/0305735689171002.
 44. Nideffer, R. M. and Hessler, N. D. (1978) 'Controlling Performance Anxiety', *College Music Symposium*, 18(1), pp. 146–153.
 45. Osborne, M. S. and Franklin, J. (2002) 'Cognitive processes in music performance anxiety', *Australian Journal of Psychology*, 54(2), pp. 86–93. doi: 10.1080/00049530210001706543.
 46. Osborne, M. S. and Kenny, D. T. (2008) 'The role of sensitizing experiences in music performance anxiety in adolescent musicians', *Psychology of Music*, 36(4), pp. 447–462. doi: 10.1177/0305735607086051.
 47. Osborne, M. S., Kenny, D. T. and Holsomback, R. (2005) 'Assessment of Music Performance Anxiety in Late Childhood: A Validation Study of the Music Performance Anxiety Inventory for Adolescents (MPAI-A)', *International Journal of Stress Management*, 12(4), pp. 312–330. doi: 10.1037/1072-5245.12.4.312.
 48. Papageorgi, I., Creech, A. and Welch, G. (2013) 'Perceived performance anxiety in advanced musicians specializing in different musical genres', *Psychology of Music*, 41(1), pp. 18–41. doi: 10.1177/0305735611408995.
 49. Robertson, D. U. and Eisensmith, K. E. (2010) 'Teaching Students about Performance Anxiety', *Music Educators Journal*, 97(2), pp. 31–35. doi: 10.1177/0027432109335078.
 50. Rush, S. (2013) 'Improvisational Therapy Methods May Help Alleviate Music Performance Anxiety Symptoms in College Musicians', *Ursidae: The Undergraduate Research Journal at the University of Northern Colorado*, 3(2).
 51. Ryan, C. and Andrews, N. (2009) 'An investigation into the choral singer's experience of music performance anxiety', *Journal of Research in Music Education*, 57(2), pp. 108–126. doi: 10.1177/0022429409336132.
 52. Salmon, P. G. (1990) 'A psychological perspective on Music Performance Anxiety: A Review of the Literature', *Medical Problems of Performing Artists*, 5(March), pp. 2–11.
 53. Schachter, S. and Singer, J. E. (1962) 'Cognitive, Social and Physiological Determinants of Emotional State', *Psychological Review*, 72(Vol. 69. No 5), pp. 379–399. doi: 10.1037/h0021802.
 54. Schiepe-Tiska, A. and Engeser, S. (2012) 'Flow in non-achievement situations', in *Advances in flow research*. doi: 10.1007/978-1-4614-2359-1.
 55. Shaw, T. A., Juncos, D. G. and Winter, D. (2020) 'Piloting a New Model for Treating Music Performance Anxiety: Training a Singing Teacher to Use Acceptance and Commitment Coaching With a Student', *Frontiers in Psychology*, 11(882), pp. 1–14. doi: 10.3389/fpsyg.2020.00882.
 56. Simoens, V. L., Puttonen, S. and Tervaniemi, M. (2015) 'Are music performance anxiety and performance boost perceived as extremes of the same continuum?', *Psychology of Music*, 43(2), pp. 171–187. doi: 10.1177/0305735613499200.
 57. Spahn, C. et al. (2010) 'Music performance anxiety in opera singers', *Logopedics Phoniatrics Vocology*, 35(4), pp. 175–182. doi: 10.3109/14015431003720600.
 58. Spahn, C. (2015) 'Treatment and prevention of music performance anxiety', in *Progress in Brain*

- Research*. 1st edn. Elsevier B.V., pp. 129–140. doi: 10.1016/bs.pbr.2014.11.024.
59. Studer, R. *et al.* (2011) 'Stage fright: Its experience as a problem and coping with it', *International Archives of Occupational and Environmental Health*, 84, pp. 761–771. doi: 10.1007/s00420-010-0608-1.
 60. Sundberg, J. and Romedahl, C. (2009) 'Text Intelligibility and the Singer's Formant-A Relationship?', *Journal of Voice*, 23(5), pp. 539–545. doi: 10.1016/j.jvoice.2008.01.010.
 61. Weir, M. (1998) 'Singers are from Krypton and Instrumentalists are from Ork', *Jazz Educator's Journal*, pp. 69–73.
 62. Weisblatt, S. (1986) 'A Psychoanalytic View of Performance Anxiety', *Medical Problems of Performing Artists*.
 63. Wesner, R. B., Noyes, R. and Davis, T. L. (1990) 'The occurrence of performance anxiety among musicians', *Journal of Affective Disorders*, 18(3), pp. 177–185. doi: 10.1016/0165-0327(90)90034-6.
 64. Wolfe, M. L. (1989) 'Correlates of Adaptive and Maladaptive Musical Performance Anxiety', *Medical problems of performing artists*, 4(1), pp. 49–56.
 65. Zakaria, J. B., Musib, H. B. and Shariff, S. M. (2013) 'Overcoming Performance Anxiety Among Music Undergraduates', *Procedia - Social and Behavioral Sciences*, pp. 226–234. doi: 10.1016/j.sbspro.2013.07.086.

Appendix I: The MPA and Flow Questionnaire for Popular Music Singers

Stage Fright in Popular Music Singers

Are you a popular music singer? Do you struggle with stage fright? Or are you extremely confident on stage and want to help other colleagues to overcome stage fright? We are trying to build a new approach to help popular music singers that struggle with the sense of panic that often accompanies a performance. But first we need your help! Please answer these questions about your personal experience with stage fright so that we can collect data for our research! Thank you!

The questionnaires are for research purposes only and are taken anonymously

* Required

Informed
Consent

This questionnaire is designed to collect details about your own experience with stage fright. We will ask you general questions about your age, education and background and specific questions about the causes and effects of stage fright in your own experience. Our goal is to gain enough data from singers of different Western Countries in order to better understand how stage fright affects popular music singers and develop effective techniques in order to face it. By agreeing to participate in this research, you understand that all data are collected anonymously and that no harm will come to you by participating in this research. Participating in the study will not give you any financial or personal benefit, but you will contribute in our effort to better understand the effects of Stage Fright in Popular Music Singers and to develop therapies to face it. The whole questionnaire is supposed to take 15 minutes of your time. Should you, at any point, feel uncomfortable about the questions, you are free to exit the form with no repercussions. Please tick the consent box below if you understand the goals and methods of this research and you agree to take part in it.

1. *

Mark only one oval.

I understand the goals and methods of this research and agree to take part in it. I hereby confirm that my answers are true and that I'm participating in this research based on my own will.

Untitled Section

2. Are you a singer? *

Mark only one oval.

Yes *Skip to question 3*

No *Skip to section 4 (Sorry, we are looking for Singers!)*

Sorry, we are
looking for
Singers!

Our research concentrates solely on stage fright in popular music singers, sorry! Thank you anyway for taking the time to fill out our questionnaire, we really appreciate it!

3. Do you sing popular music or classical music/opera? *

Mark only one oval.

- Popular music (meaning all genres that require a non-operatic vocal technique, including Pop, Rock, Musical Theatre, Jazz, Metal etc) Skip to question 4
- Classical music/Opera Skip to section 6 (Sorry, we are looking for popular music singers!)
- Both Skip to question 4

Sorry, we
are
looking
for
popular
music
singers!

Our research concentrate on singers of popular music, meaning singers that use a popular music vocal technique, perform with a dynamic microphone and perform popular music genres (pop, folk, rock, jazz, musical etc). Thank you anyway for taking your time and filling our questionnaire, we really appreciate it!

4. Are you... *

Mark only one oval.

- Female
- Male
- Transgender female
- Transgender male
- Gender variant/Non conforming
- Prefer not to answer

5. How old are you? *

6. Where do you live? *

7. Where did you grow up? *

8. What level of musical education have you completed as for today? *

Mark only one oval.

- I never studied music formally
- Undergraduate studies
- BMus
- Music MA
- Music PhD

9. How many years have you been performing as a popular music singer? (By performance we mean any situation in which you sing in front of any kind of audience) *

Mark only one oval.

- Less than two years
- Between two and ten years
- More than ten years

10. In which situations have you performed till now? (Multiple choice) *

Check all that apply.

- Family occasions and private performances
- Recitals
- Concerts and festivals
- Competitions
- All of the above

Other: _____

11. Do you use a dynamic microphone when performing? *

Mark only one oval.

- Always
- Most of the times
- Sometimes
- Rarely
- Never

12. How confident do you feel in using the microphone? Choose the option that better describes your feeling

Mark only one oval.

- Not confident at all: I struggle with the use of the microphone and I avoid using it whenever I can
- Not very confident
- Moderately confident
- Confident
- Very confident

13. During your studies as a performer, have you ever received structured education regarding the use of the microphone and general sound guidelines for amplified music performances? *

Mark only one oval.

- Yes
- No
- I had a bit of education from some of my teachers, but no structured course about it

14. Do you write your own music and perform with it? *

Mark only one oval.

- Yes
- No

15. Would you describe yourself as an anxious person in everyday life? Choose the answer you most relate to *

Mark only one oval.

- Not at all
- I almost never experience anxiety
- I'm moderately anxious
- I'm quite anxious
- I'm very anxious

16. Do you feel that stress is harmful to you and in order not to experience stage fright you should try to relax? *

Mark only one oval.

- Yes
 No

17. From 1 to 5 how much do you experience stage fright? *

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much

18. From 1 to 5 how big of a part do you feel the use of the microphone plays in your stage fright? *

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much

19. Do you feel that singing your own music causes you more stage fright than singing covers? *

Mark only one oval.

- Yes
 No
 Irrelevant (I never sing my own music)

20. (For females only) Have you noticed any connection between your menstrual cycle and the occurrence of stage fright?

Mark only one oval.

- Yes - when I'm on my period/close to my period I tend to suffer more of stage fright
- Yes - when I'm on my period/close to my period I tend to suffer less of stage fright
- No - I haven't noticed any correlation between my period and my stage fright
- I'm not sure
- Irrelevant

21. Which one of these sentences describes best your relationship with stage fright? *

Mark only one oval.

- When on stage I feel completely comfortable and I feel my best performances are those in front of a public
- I experience stage fright but, when I do, I still can perform, even if not at my best
- I am quite affected by stage fright, it bothers me during the performance
- I am very affected by stage fright and I feel that my singing in front of a public is always worse than during rehearsals
- I am the definition of "stage fright" the only idea of getting on stage paralyses me with fear

22. Have you ever tried to treat stage fright with pharmacological, psychological, behavioural or other kinds of therapies? *

Mark only one oval.

- Yes
- No *Skip to question 31*

23. Have you ever tried to treat stage fright with Pharmacological treatment (e.g., Beta-blockers)?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

24. Have you ever tried to treat stage fright with Meditation?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

25. Have you ever tried to treat stage fright with Hypnotherapy?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

26. Have you ever tried to treat stage fright with Cognitive - behavioural intervention?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

27. Have you ever tried to treat stage fright with Alexander Technique and other body relaxation therapies?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

28. Have you ever tried to treat stage fright with Psychotherapy?

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

29. Have you ever tried to treat stage fright with EMDR (Eye Movement Desensitization and Reprocessing)

Mark only one oval.

- No
- Yes - it helped a lot
- Yes - it helped a little
- Yes - it didn't help at all

30. If you have tried treatments not listed above, please write which one have you tried and if they helped

Please choose from 1 to 5 how much you relate to the following sentences

31. When I am on stage I cannot control my body and freeze with fear *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

32. When I am on stage I have sometimes the feeling of looking at myself from the side *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

33. When I am on stage I feel like I am going to faint *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

34. When I am on stage my heart beat is faster and I can feel it pumping in my chest and ears *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

35. When I am on stage my hands sweat *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

36. When I am on stage my mouth and throat are suddenly dry *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

37. When I am on stage I have the constant fear of forgetting the words *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

38. Often the day of a performance I wake up with a sore throat as if I were about to be ill *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

39. When I get off stage after a performance I can't remember what I did while I was on stage, I only remember it was bad *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

40. I am never satisfied with my performances on stage and always feel like I perform much better during rehearsals *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

41. When on stage I shake with fear *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

42. When on stage, I feel the microphone is bothering me, and I never know what to do with my hands

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

43. If during a performance I make a mistake, I get really nervous and the chances of me making more mistakes grow *

Mark only one oval.

	1	2	3	4	5	
I dont relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

44. During amplified performances I can never hear myself properly, I feel there is too much noise on stage and my voice from the monitors always sounds weird

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

45. When I perform with my own material I get really nervous because I'm concerned that the public won't like my songs

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

46. Please write to us a short description of your personal experience with stage fright, you can describe a particular event or your general experiences through the years

47. Do you ever experience confidence on stage, as if music was just flowing out of you without any effort? *

Mark only one oval.

- Yes, most of my performances feel like that
- Yes, I have experienced this many times
- Yes, I have sometimes experienced this
- I have experienced this very rarely
- No, I almost never experienced this

Please choose from 1 to 5 how much you relate to the following sentences

48. When on stage, I feel like my body knows automatically what to do and music is flowing out by itself *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

49. When on stage, I feel like I am looking at my self from the side like in a dream *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

50. After a performance I don't quite remember what happened while I was on stage, I only remember it was really good *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

51. When on stage, I feel my heart beat is very fast and I feel very powerful *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

52. When on stage, I often shake because of the adrenaline *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

53. When on stage, I am very confident, so even if I do make a mistake I don't get stressed and no-one notices *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

54. I feel the performances I give on stage in front of a public are my best performances *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

55. When on stage, my singing is effortless and the microphone helps me enhance my performance *

Mark only one oval.

	1	2	3	4	5	
I don't relate at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I very much relate

56. If during a performance I forget the words, I just make them up and improvise, and no one notices *

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

57. During balance I always know what to ask of the soundman so that I will hear myself properly during the performance

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

58. When I perform with my own material I am very confident, because I know the public will love my songs, I believe my songs have a great musical value

Mark only one oval.

1 2 3 4 5

I don't relate at all I very much relate

59. Please write to us about a very successful performance you had, or the general feeling you have during a performance where you feel confident and comfortable on stage

Skip to question 60

Thank you for submitting your questionnaire!

Your answers were submitted and will contribute to our research!

Appendix II: Full results of Reliability Statistics for MPA and Flow Sections

MPA section

Reliability Statistics

Cronbach's Alpha	N of Items
.863	15

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
When I am on stage, I cannot control my body and freeze with fear	32.01	103.573	.576	.851
When I am on stage I have sometimes the feeling of looking at myself from the side	31.68	107.978	.328	.863
When I am on stage, I feel like I am going to faint	32.44	108.478	.521	.856
When I am on stage my heart beat is faster and I can feel it pumping in my chest and ears	30.99	101.828	.591	.850
When I am on stage my hands sweat	31.54	101.409	.570	.851
When I am on stage my mouth and throat are suddenly dry	31.37	100.057	.612	.849
When I am on stage I have the constant fear of forgetting the words	30.71	103.074	.475	.856

Often the day of a performance I wake up with a sore throat as if I were about to be ill	31.80	105.653	.403	.860
When I get off stage after a performance, I can't remember what I did while I was on stage, I only remember it was bad	31.89	101.668	.598	.850
I am never satisfied with my performances on stage and always feel like I perform much better during rehearsals	31.23	98.282	.638	.847
When on stage I shake with fear	31.90	102.958	.569	.851
When on stage, I feel the microphone is bothering me, and I never know what to do with my hands	31.98	105.076	.443	.858
If during a performance I make a mistake, I get really nervous and the chances of me making more mistakes grow	31.24	98.859	.644	.847
During amplified performances I can never hear myself properly, I feel there is too much noise on stage and my voice from the monitors always sounds weird	31.38	105.715	.375	.862
When I perform with my own material I get really nervous because I'm concerned that the public won't like my songs	31.63	108.070	.286	.866

Flow section

Reliability Statistics

Cronbach's Alpha	N of Items
.795	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
When on stage, I feel like my body knows automatically what to do and music is flowing out by itself	28.36	51.346	.747	.747
When on stage, I feel like I am looking at myself from the side like in a dream	29.54	60.840	.186	.805
After a performance I don't quite remember what happened while I was on stage, I only remember it was really good	29.22	59.726	.271	.796
When on stage, I feel my heart beat is very fast and I feel very powerful	28.65	57.626	.393	.784
When on stage, I often shake because of the adrenaline	28.64	63.603	.041	.819
When on stage, I am very confident, so even if I do make a mistake, I don't get stressed and no-one notices	28.85	49.998	.705	.748
I feel the performances I give on stage in front of a public are my best performances	28.69	50.432	.680	.751

When on stage, my singing is effortless and the microphone helps me enhance my performance	28.74	52.053	.672	.755
If during a performance I forget the words, I just make them up and improvise, and no one notices	28.62	54.558	.473	.776
During balance I always know what to ask of the soundman so that I will hear myself properly during the performance	28.97	55.736	.396	.785
When I perform with my own material, I am very confident, because I know the public will love my songs, I believe my songs have a great musical value	29.30	56.570	.438	.780