

A comparative study of quantitative and qualitative research methods in published case studies: causes and manifestations of performance anxiety

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Abstract. Music performance anxiety is a common psychological phenomenon in the field of music performance, exerting a significant impact on the physical and mental state, performance quality, and career development of performers. It typically manifests in three dimensions: physiological, psychological and behavioural symptoms. Existing research employs both quantitative and qualitative approaches, each with distinct emphases. This paper systematically analyses the differences between these two research paradigms by comparing two representative case studies. The comparison is structured around several key dimensions: research objectives, research design, sample selection, data types, analytical methods, presentation of results, strategies for ensuring reliability and validity, and the role of the researcher. The paper begins with a literature review, followed by a detailed comparison of quantitative and qualitative methods across the aforementioned dimensions. It concludes with a discussion of the advantages and limitations of each approach in exploring the causes and manifestations of performance anxiety, in relation to the research questions. Findings indicate that quantitative research is characterised by reproducibility, standardisation, and structured procedures for data collection and analysis, making it particularly suitable for exploring the prevalence and predictors of performance anxiety. In contrast, qualitative research offers flexibility and depth, enabling a nuanced understanding of performers' psychological responses in specific contexts. Ultimately, the choice of research method should be guided by the specific aims and questions of the study. In practical research, quantitative and qualitative research can be used together to give full play to the advantages of both methods.

Keywords: music performance anxiety, quantitative research, qualitative research, comparison of research methods, case study

1. Introduction

Music performance anxiety is a prevalent psychological phenomenon in the field of music performance, especially among professional musicians and students. It affects not only the performer's psychological state, but can also affect the quality of their performance. Manifesting as physical, psychological, and behavioural symptoms, performance anxiety can hinder artistic expression, impede career development, and negatively influence mental health, leading to decreased performance quality and increased stress levels [1].

To better understand the causes and manifestations of performance anxiety, researchers have adopted a range of methodological approaches, among which quantitative and qualitative research are the two dominant paradigms. This article compares two published case studies to explore how these paradigms are applied in the study of performance anxiety. The selected articles are: Perceived performance anxiety in advanced musicians specialising in different musical genres (quantitative research) [1] and The role of sensitising experiences in music performance anxiety in adolescent musicians (qualitative research) [2].

This article is broadly divided into three sections. The first section presents a literature review of eight articles employing quantitative, qualitative, or mixed-methods approaches, providing a comprehensive background for understanding methodological diversity in performance anxiety research. The second section offers a detailed comparison of quantitative and qualitative methods across several dimensions: research objectives, study design, sample selection, data types, data analysis methods, presentation of results, strategies for ensuring reliability and validity, and the role of the researcher. The final section summarises the methodological comparison and discusses which approaches are best suited to investigating the causes and manifestations of music performance anxiety.

2. Literature review

Music performance anxiety is a pervasive psychological phenomenon among musicians that significantly affects their artistic expression and career development. Recent studies have employed a variety of methods, including quantitative, qualitative, and mixed methods, to explore the causes, manifestations, and coping strategies associated with music performance anxiety.

Quantitative studies have examined a range of factors related to performance anxiety. For example, Kenny et al. investigated the relationship between performance anxiety, occupational stress, trait anxiety, and perfectionism in opera choral artists, finding that perfectionism and occupational stress significantly increase anxiety levels [3]. Similarly, Papageorgi et al. investigated performance anxiety across different musical genres and found that classical musicians reported higher levels of anxiety than jazz and pop musicians, and that performance experience was negatively correlated with anxiety [4]. Osborne and Kenny contributed to the field by developing and validating the Adolescent Musical Performance Anxiety Scale, providing a reliable tool for measuring anxiety in young musicians [5]. Yoshie et al. further expanded the scope by studying the effects of social evaluation on pianists, demonstrating that evaluative contexts significantly heighten both subjective and physiological anxiety responses [6].

Qualitative research has offered deeper insight into musicians' lived experiences. Osborne and Kenny explored the role of sensitive experiences (such as negative feedback and performance failure) in shaping adolescent musicians' performance anxiety, emphasising the importance of positive performance experiences and social support [2]. Ryan and Andrews focused on choral singers, revealing that anxiety often stems from fear of judgment and group dynamics, while peer support can help mitigate these effects [7].

Mixed-methods studies have combined the strengths of both approaches. Fehm and Schmidt used surveys and interviews to examine performance anxiety in gifted adolescent musicians, showing that anxiety levels tend to decrease with increased performance experience and that coping strategies play a crucial role in managing anxiety [8]. Williamon and Thompson also highlighted the prevalence of performance anxiety among conservatory students and linked it to academic stress and career problems [9].

In summary, these studies provide a broad understanding of music performance anxiety and demonstrate the complementary value of quantitative, qualitative, and mixed-methods approaches in addressing this complex issue.

3. Comparative study of quantitative and qualitative research methods

3.1. Comparison of study objectives

In their quantitative study, Papageorgi et al. aimed to test hypotheses and explore differences in performance anxiety across different musical genres, as well as its relationship with perfectionism and self-efficacy, helping to fill the gap in research on non-classical musicians [1]. Their objective was to reveal general patterns at the group level and provide an empirical basis for potential interventions.

In Osborne and Kenny's qualitative research, they explicitly sought to reveal the subjective causes (e.g., negative experiences, cognitive patterns) and multidimensional manifestations (emotional, behavioural, physiological) of performance anxiety in adolescent musicians [2]. By identifying key anxiety triggers, such as the presence of judges or technical errors, their work provides a basis for subsequent cognitive-restructuring training.

Overall, quantitative research focuses on testing theoretical hypotheses and generating generalisable conclusions through standardised tools and statistical methods, emphasising objectivity and generalisability. Qualitative research, by contrast, generates context-specific insights through open-ended questions and unstructured data, emphasising subjectivity and contextuality.

3.2. Comparison of study designs

Papageorgi et al.'s quantitative study used a 57-question questionnaire to collect data on musicians' background information, psychological characteristics, and experiences of performance anxiety, while controlling for confounding variables such as gender and age through statistical methods [1]. The questionnaire was distributed online, and responses were automatically aggregated to a central server for analysis. This design enabled the collection of large amounts of data and facilitated the exploration of relationships between variables, emphasising control and standardisation.

However, over-reliance on self-report measures, the absence of objective physiological data, and measurement of anxiety only through questionnaires may be affected by social expectations or memory biases, and the comprehensiveness of the data cannot be guaranteed. In addition, the study only measured anxiety at a certain point in time, limiting its ability to determine long-term changes or causal mechanisms of anxiety. Moreover, this design does not adequately examine the performance context, even though anxiety can vary substantially across different situations.

Osborne and Kenny's qualitative study adopted a phenomenological interpretative design, collecting data through semi-structured interviews that allowed participants to introduce themes beyond the preset questions. Participants were asked to describe their "worst performing experience," with guiding prompts related to age, performance occasion, audience, and subsequent events [2]. This design enabled an in-depth exploration of individual psychological experiences, emphasising flexibility and openness, and was well-suited to theory development based on small samples. A limitation, however, is that retrospective accounts may be influenced by "peak effect" biases, which can lead to errors in the results.

Overall, quantitative research emphasises reproducibility and universality, while qualitative research prioritises depth and uniqueness. The two approaches can complement each other to fill the gaps created by a single research method. For example, questionnaires can be combined with interviews to understand the broad patterns and subjective experiences of anxiety.

3.3. Comparison of sample selection

Papageorgi et al.'s quantitative study used a large sample of professional musicians from different musical genres ($n = 244$), including 70% undergraduate students and 30% professional musicians, with a gender distribution of 55% men and 45% women [1]. The sample covered four musical genres, and participants represented major groups of instruments. This diverse sample allowed the researchers to compare performance anxiety across genres and enhanced the external validity of the study. However, the imbalance of samples among schools may limit the representativeness of some subgroups.

In the qualitative study, Osborne and Kenny selected 298 students from three elite performing arts high schools, representing various music specialisations (e.g., brass, piano, strings) and averaging 6.5 years of instrumental training [2]. Selection criteria included performance experience, potential experience of performance anxiety, and diversity in gender, age, and occupation. The advantage of this approach is that all participants shared a similar musical training environment, experience of high-frequency performances, and exposure to professional evaluations, providing valuable insights into the performance anxiety of adolescent music students. The limitation is that the sample was from a specific school and may be geo-restricted and over-reliant on self-reported data, which may introduce bias.

In general, quantitative research emphasises sample size and diversity, while qualitative research is characterised by a focus on typicality and relevance to ensure depth and richness of data. This sampling strategy is well-suited to in-depth interviews and thematic analysis, where quality and depth are more important than breadth.

3.4. Comparison of data types

Papageorgi et al.'s quantitative study used a standardised psychological scale (self-efficacy scale) and quantified anxiety levels using a Likert scale to facilitate statistical analysis and reduce researcher bias [1]. The situational data included the anxiety level before, during, and after the performance, as well as self-evaluations of the performance quality, allowing the researchers to capture the dynamic changes in anxiety. However, the data still had limitations, such as the absence of objective indicators like physiological data (e.g., heart rate) or behavioural data (e.g., number of technical performance errors). In addition, the questionnaire was completed 24-72 hours after the performance, introducing recall bias. It also did not account for anxiety experienced during daily practice.

In Osborne and Kenny's qualitative research, a mixture of data types (qualitative text and quantitative scales) was used. This included transcripts from semi-structured interviews and field observation notes [2]. This data provided insight into participants' subjective experiences, with students recalling real events that helped preserve situational authenticity. This type of data is less structured and is well-suited for thematic analysis, such as identifying core themes and metaphors. However, it may be influenced by social factors, such as participants concealing reactions they believe are socially undesirable.

In contrast, quantitative research emphasises the objectivity and comparability of data, whereas qualitative research emphasises subjectivity and richness of data.

3.5. Comparison of data analysis methods

The quantitative study by Papageorgi et al. employed statistical methods such as multiple regression analysis, Analysis of Variance (ANOVA), and path analysis [1]. They also tested the reliability of the scales to ensure the consistency of the measurement tools. This approach is suitable for validating hypotheses and generating generalisable conclusions.

Osborne and Kenny's qualitative study used thematic inductive approaches to identify core themes, such as the dominant role of negative cognition (e.g., fear of failure, fear of others' evaluation), gender differences, the influence of trait anxiety (i.e., an individual's tendency to respond steadily to stressful situations), negative performance experiences, and the long-term effects of emotional and physiological responses [2]. The method revealed the subjective experiences of adolescent music students and provided valuable insights for future interventions and educational practice. However, thematic coding depends on the judgment of the researcher, meaning that interpretations may vary. Furthermore, it is not possible to explain the specific reason for the participant's reaction. In addition, the scales used in the study were developed in Western contexts and may not be universally applicable. Some scales may also have generalisations that skew participants' results, e.g., by not describing specific performance scenarios where there is a fear of performance failure.

Overall, quantitative analysis emphasises quantification and statistical relationships, while qualitative analysis focuses on the interpretation and generalisation of data. Each method has its own advantages but also limitations when used alone.

3.6. Comparison of how the results are presented

Papageorgi et al. presented their quantitative results numerically, for example: "Anxiety levels were significantly higher in classical musicians ($M = 4.2$, $SD = 0.8$) than in jazz musicians ($M = 3.1$, $SD = 0.7$)" [1]. This format is suitable for policy development or clinical interventions where clear, measurable outcomes are needed.

Osborne and Kenny's qualitative study presented their findings in the form of a narrative, such as: "One participant described feeling 'like an impassable mountain' on stage for a long time after the failure of his first public performance" [2]. This style is particularly useful in psychotherapy or educational practice, where understanding personal experience is essential.

In comparison, quantitative results emphasise accuracy and objectivity, while qualitative results emphasise context and subjective meaning.

3.7. Comparison of reliability and validity of studies

Papageorgi et al.'s quantitative study ensured reliability through internal consistency testing and assessed validity through factor analysis and correlations with other scales [1]. However, the study did not verify the relationship between questionnaire scores and performance errors, and it lacked tracking data to verify its stability. In addition, performance anxiety and social anxiety were not clearly distinguished, affecting the validity of the study.

Osborne and Kenny's qualitative study assessed inter-encoder reliability and validity through member checking and triangulation. However, the reliance on participants' memories of past events may lead to distortions, such as exaggeration or omission of details. Moreover, all data were self-reported, which may introduce common-method bias and affect the validity of the findings.

Overall, quantitative research emphasises standardisation and reproducibility, making it suitable for large-scale surveys and statistical analysis. Qualitative research emphasises transparency and credibility, making it suitable for in-depth interviews and thematic analysis.

3.8. Comparison of the role of the investigator

In Papageorgi et al.'s quantitative study, the researcher was a neutral observer, collecting data through standardised tools to minimise subjective intervention [1]. This role design emphasises objectivity and is suitable for large-scale surveys and statistical analysis.

In Osborne and Kenny's qualitative research, the role of the researcher is that of an active participant, and the data were obtained through interaction with the participants, which may influence the data generation process [2]. This role emphasises participation and is suitable for in-depth interviews and thematic analysis.

In summary, quantitative research highlights the investigator's neutrality, while qualitative research highlights the investigator's involvement.

4. Conclusion

This article compares quantitative and qualitative approaches to studying the causes and manifestations of performance anxiety. Quantitative research draws general conclusions through large-scale data collection and statistical analysis. Its strengths lie in reproducibility, standardisation, and structured data collection and analysis. By using psychometric tools and online questionnaires to gather large amounts of data, and by analysing variable relationships through statistical methods such as multiple regression, quantitative research is well-suited for exploring the prevalence and predictors of performance anxiety [1].

Qualitative research, on the other hand, reveals the complexity and diversity of performance anxiety through in-depth examination of individual psychological experiences. Its strengths lie in the flexibility and depth of data collection and analysis. Through open-ended questions and content analysis, qualitative research can explore personal experiences in detail and identify key themes and influencing factors, making it particularly useful for understanding psychological responses in specific contexts [2].

The choice of research method should be guided by the specific research objectives and questions. If the goal of the study is to explore the prevalence of performance anxiety and identify its predictors, quantitative methods are more appropriate. Large-scale data collection and statistical analysis allow researchers to draw generalisable conclusions. Conversely, if the goal is to explore individual psychological experiences and complex emotional responses, then qualitative research is the more appropriate option. By delving into personal narratives, qualitative studies can reveal the complexity and diversity of performance anxiety.

In practical research, quantitative and qualitative approaches can be used in conjunction to take full advantage of both. Combining the breadth of quantitative data with the depth of qualitative insights provides a more comprehensive understanding of performance anxiety.

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