frontiers | Research Topics

Motivation in learning and performance in the arts and sports

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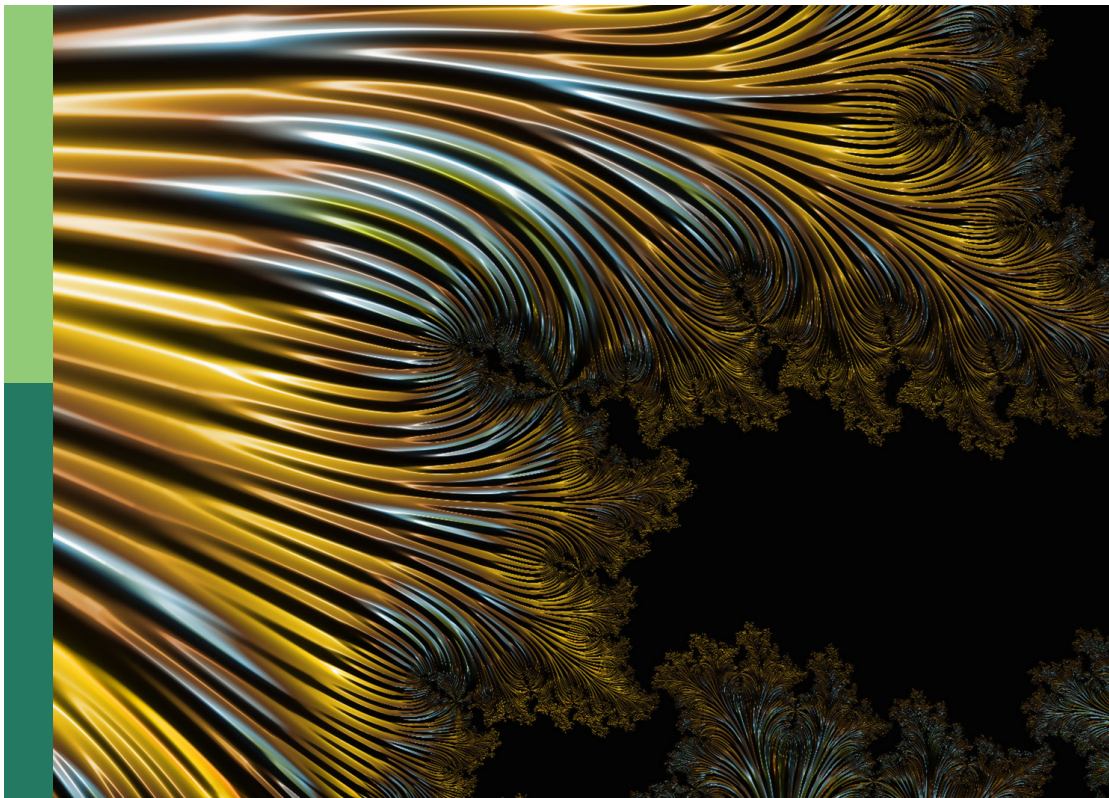
Published in
Frontiers in Psychology



ISSN 1664-8714
ISBN 978-2-8325-6034-1
DOI 10.3389/978-2-8325-6034-1

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Motivation in learning and performance in the arts and sports

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Citation

Mornell, A., Heuser, F., Osborne, M. S., Kageyama, N., eds. (2025). *Motivation in learning and performance in the arts and sports*. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-8325-6034-1

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frontiers | Frontiers in Psychology

TYPE Editorial
PUBLISHED 10 February 2025
DOI 10.3389/fpsyg.2025.1554109

OPEN ACCESS

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RECEIVED 01 January 2025
ACCEPTED 17 January 2025
PUBLISHED 10 February 2025
CORRECTED 16 October 2025

CITATION
Mornell A, Osborne MS, Kageyama N and Heuser F (2025) Editorial: Motivation in learning and performance in the arts and sports. *Front. Psychol.* 16:1554109. doi: 10.3389/fpsyg.2025.1554109

Editorial: Motivation in learning and performance in the arts and sports

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KEYWORDS

motivation, music, performance science, pedagogy, cognitive reappraisal, wellbeing

Editorial on the Research Topic
Motivation in learning and performance in the arts and sports

Introduction

Motivation is a crucial factor in achieving success in any field, but especially in the performing arts and sports, where consistent practice, discipline, and creativity are required to maintain a high level of performance. The science of motivation is relevant today more than ever for several reasons. First, motivation is a fundamental aspect of human behavior, and understanding what drives individuals to perform at their best is essential in many contexts, including education, athletics, and the workplace. Second, motivation is critical for achieving goals, and an understanding of what motivates individuals can help them to set and achieve realistic and meaningful aims. Third, motivation is essential for maintaining mental and physical health and wellbeing, and an exploration of contributory factors can help individuals manage stress and anxiety.

This Research Topic collected articles that provide insights into motivation and drive over the short and long term, even in the face of challenges that may arise. The Research Topic provides interdisciplinary perspectives on motivation and explores factors that motivate learners and professionals to optimize their training methods in order to sustain effort over time. The editors hope that this Research Topic will aid in the development of strategies that promote and maintain motivation.

Summaries

Wieser et al.: *Who stays? Who goes? Motivational Development and Tendency to drop out in Music Schools*

Two articles in this Research Topic investigate the contribution of basic psychological needs (BPN) satisfaction to optimal emotional and behavioral outcomes across music and sport at different stages of expertise. In the first, Wieser et al., explore the factors contributing to music student dropout. Autonomy, competence, and social relatedness need satisfaction were considered alongside parental involvement as key variables in

shaping students' motivation and ultimately their decision to stay or leave music school. Their survey of 140 Austrian music students between the ages of 8 and 27 (M_{age} = 12.86, SD = 3.89) reveals that BPN satisfaction during lessons, coupled with parental involvement, significantly predicts autonomous (self-determined) motivation, which in turn was strongly associated with persistence in music school. Conversely, controlled motivation, driven by external pressures or feelings of guilt, was more likely to lead to dropout. Their study emphasizes the practical implications of fostering need satisfaction and parental involvement to promote autonomous motivation and reduce dropout rates in music education.

Robazza et al.: *Athletes' basic psychological needs and emotions: the role of cognitive reappraisal*

The second BPN article, Robazza et al., presents a questionnaire study conducted with 424 competitive athletes across multiple sports. The authors investigated the influence of cognitive reappraisal and expressive suppression in connection with athletes' feelings of competence, autonomy, and relatedness, and their experiences of emotions including happiness, excitement, anxiety, dejection, and anger. Athletes with greater BPN satisfaction were more likely to utilize cognitive reappraisal as an emotion regulation strategy, which leads to more positive emotions and psychobiosocial performance states.

Immerz et al.: *Student motivation to study music and sport – a comparison between study subjects and study programs on intrinsic and extrinsic motivational aspects*

It is clear that both music and sports require highly-skilled performance based upon optimal training/practice strategies. There are often controversial discussions about the extent to which athletics and the arts are similar and dissimilar. Immerz et al., compared the motivations of music and sport majors for selecting their academic program in a questionnaire study of 151 university students in Freiburg, Germany. They found that both groups demonstrated similarly high levels of intrinsic motivation to pursue their respective field of studies, although there were differences between those enrolled in bachelor in music performance programs vs. those studying school teacher education in programs leading to state certification. Specifically, German teacher education students in both music and sport reported higher levels of extrinsic motivation compared to bachelor students. The authors suggest that this difference might stem from the more defined career paths and structured income associated with teaching compared to the less clearly defined career prospects for those pursuing non-teaching roles in music and sport.

Gumm: *Music motivation depends on what to motivate: research review of Gumm's music teaching and conducting models*

In a review of several decades of research on Gumm's models of music teaching and conducting, Gumm explores teacher and conductor behaviors, or approaches, that motivate specific learning outcomes in music education. The study contrasts two overarching priorities—"control" (e.g., where instructors provide clear task directions and corrective feedback to the student) and "release" (e.g., where students are encouraged to self-diagnose problems or rehearse with and perform for each other). While control is more prevalent, overemphasis on control can lead to teacher burnout and student dropout. Experienced educators tend to shift toward release-oriented teaching, prioritizing deeper learning and student autonomy. The author suggests that professional development could help music educators develop a balanced approach that incorporates both control and release strategies to motivate effective learning.

López-Íñiguez and McPherson: *Using a music microanalysis protocol to enhance instrumental practice*

In a multi-case study by López-Íñiguez and McPherson the authors identify and highlight a potential deficit in the traditional master-apprentice model suggest that this form of teaching does not necessarily promote self-responsibility in the learner. Indeed, developing one's self-regulatory skills is one of the most important challenges of our times (faced not only by musicians). The authors employed the "Optimal Music Practice Protocol" (OMPP) to study the learning process. This microanalysis tool offers a structure of engagement to the learner, a technique for practice that supports autonomy. In a multiple-case study, the authors followed four highly proficient cellists during the preparation of completely new repertoire for a public recital. The use of the OMPP allowed the researchers to evaluate the learners' use of the three parts of the self-regulation model (Zimmerman's SRL—see dos Santos Silva et al. above) which was informed by the self-determination theories of Deci and Ryan. These are the (1) Forethought phase, (2) Performance phase, and (3) Self-reflection phase. The study ran over a period of many months and culminated in a concert performance. In evaluating the results, the authors concluded that the OMPP is a useful framework most effective for those musicians who have a developed "learner identity." In other words, those who adopt a mindset of life-long learning are most motivated to take the steps necessary for the learning process. They invest patience into their work, and remain humble in the face of challenges.

Du: *Modeling the predictive role of music teachers' job commitment and optimism in their sense of self-efficacy*

Music teachers' commitment and academic optimism with respect to self-efficacy were the focus of Du's questionnaire that was developed following a literature review and subsequently conducted at four universities in China. Similar to dos Santos Silva et al. conclusions (see below), the analysis of 340 participants' data led the author to suggest that teacher education in China should be augmented with psychological topics such as motivation, mental health, and support for self-competence and identity—all themes found in multiple other papers in this Research Topic. The author recommends that music teachers receive training in practical techniques to deal with the individual learners and their emotions. By widening the lens of pedagogical training, future teachers can learn to embrace skills beyond musical competence needed to best address the needs of their own students.

Satka and Garneva: *Model of motivational competence: creation of students' motivation, assessment, and research*

In their literature-based study, Satka and Garneva apply a number of analytical approaches to develop a model of motivational competence (MMC) to address their perception of decreased motivation for learning among students at all levels of education over the past several decades. From a review of motivation learning theories, they focus on "competence motivation" as put forth by Elliot and Dweck (2005). The MMC model is based on effective communication and feedback between

mentor and learner, as well as the nurturing of critical thinking skills. Central to this model are competencies based on human values and virtues that co-develop during the learning process in both teachers and students. Their model suggests that educational processes emphasizing strong values and moral virtues should provide the motivation for achieving curricular purposes and academic competencies as well as high spiritual qualities and moral principles.

Latif et al.: *The impact of genre-based instruction on Saudi university students' English writing performance and motivation: a mixed-method study*

Latif et al., explore how a genre-based instructional approach, through which students learn about different types of writing, including structures, characteristics, and conventions, influence their motivation to develop their writing skills in an English writing class at a Saudi university. Using a quasi-experimental research design, student read model texts in a target genre, collaboratively wrote sample essay parts and received feedback, and independently wrote essays in the genre. Argumentative and classification writing performance improved in the areas of text content, organization, vocabulary, language use, and mechanics. These improvements were accompanied by enhanced writing motivation, increased English writing self-efficacy and self-concept while students' English writing apprehension and anxiety decreased. The results support the conclusion that using genre-based instruction develops increased language awareness and writing competence, thereby motivating students to write.

dos Santos Silva et al.: *Attitudes in music practice: a survey exploring the self-regulated learning processes of advanced Brazilian and Portuguese musicians*

Three articles in this Research Topic focus on self-regulated learning (SRL). In the first of the three, dos Santos Silva et al., investigated learning behaviors vary among advanced musicians based on factors such as gender, nationality, instrument, practice quantity, expertise, and professional experience. The authors utilized a 22-item questionnaire completed by 300 participants, to identify three key SRL components: Practice Organization, Personal Resources, and External Resources. The results indicate that as musicians gain experience, their metacognitive processes become more prominent than the social factors influencing their performance. Furthermore, the study suggests that SRL processes are acquired throughout a musician's learning journey and become internalized with significant practice, leading to more efficient practice sessions and reduced time to achieve performance goals. As musicians reach higher levels of professional performance, personal resources tend to surpass reliance on external factors. This study provides important insights into SRL that are helpful for the understanding of two other studies in this Research Topic, those of López-Íñiguez and McPherson as well as Pucihar et al. and reaffirms the fact that, ideally, all institutions of music education would invest in teacher education. Because as important as SRL is for musicians, theoretical knowledge has been slow to be implemented into practice in some countries. Ideally, all institutions of music education would invest in teacher SRL education, support a focus on quality of practice and metacognitive strategies over efficiency, and encourage students to improve self-regulation.

Pucihar et al.: *The key reasons for dropout in Slovenian music schools – a qualitative study*

Pucihar et al., also employed self-determination theory, in this case to examine the difficulties students encounter in sustaining long-term commitment to and motivation for music studies. This study identified external factors such as ineffective teaching approaches, classroom social environment, problematic curricular matters, and limited resources as well as internal issues including a lack of perceived autonomy (student choice), feelings of competence (underdeveloped musical skills), and deficiencies in relatedness (with teachers and/or peers) as contributors leading to student dropout. Their study suggests that a holistic, individualized approach that allows a nurturing learning environment to promote autonomy, competence and relatedness can address these multiple concerns. Implementing the findings of this study could enhance the musical education of participants and reduce dropout rates of students.

Conclusions

Implications of these articles on motivation in learning and performance include recommendations for taking these results into practice. First, create supportive learning environments. For example, by providing learners with choices, opportunities for skill development, and a sense of belonging. Second, encourage adaptive emotion regulation strategies, such as cognitive reappraisal, to better manage emotions in challenging learning situations. Teach learners how to reframe their thoughts and perceptions of difficult tasks, and provide them with opportunities to practice these strategies. Third, create a mastery-oriented training climate to foster intrinsic motivation, enjoyment, and a willingness to embrace challenges rather than a singular focus on outcomes and comparisons with others. Finally, promote positive emotions and adaptive emotion regulation, to enhance both performance and wellbeing.

Author contributions

AM: Funding acquisition, Project administration, Supervision, Writing – original draft, Writing – review & editing. MO: Writing – original draft, Writing – review & editing. NK: Writing – original draft, Writing – review & editing. FH: Writing – original draft, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Correction note

A correction has been made to this article. Details can be found at: 10.3389/fpsyg.2025.1699580.

Publisher's note

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 13 July 2023
DOI 10.3389/fpsyg.2023.1205102

OPEN ACCESS

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RECEIVED 13 April 2023
ACCEPTED 13 June 2023
PUBLISHED 13 July 2023

CITATION
Robazza C, Morano M, Bortoli L and Ruiz MC (2023) Athletes' basic psychological needs and emotions: the role of cognitive reappraisal.
Front. Psychol. 14:1205102.
doi: 10.3389/fpsyg.2023.1205102

Athletes' basic psychological needs and emotions: the role of cognitive reappraisal

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In sport, where high achievements are at stake, athletes often feel pressure and emotions that hinder their performance. Emotion regulation becomes essential for athletes to handle stress, achieve optimal performance, and enhance their overall well-being. To advance both research and practical applications, it is crucial to examine the antecedents of emotion regulation and the impact on emotions and other feelings associated with performance. Specifically, the purpose of this cross-sectional study was to examine the role of athletes' emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) in the relationship between basic psychological needs satisfaction, emotions, and psychobiosocial experiences. The sample consisted of 424 competitive athletes (246 men and 178 women) involved in individual sports (n =164; e.g., fencing, gymnastics, martial arts, swimming, and tennis) or team sports (n =260; e.g., basketball, rugby, soccer, and volleyball), aged 16–36 years (M =23.08, SD =7.65). Their competitive experience ranged from 1 to 21 years (M =9.71, SD =6.34) at regional (71%), national (18%), or international (11%) level, and they practiced their sport on average 3.74 times a week (SD =1.73). Participants completed measures of basic needs satisfaction (i.e., competence, autonomy, and relatedness), emotion regulation style, emotions, and psychobiosocial experiences. Structural equation modeling results showed that competence need satisfaction was positively associated with pleasant emotions and psychobiosocial experiences that are perceived as functional for performance, and negatively associated with a maladaptive emotion regulation style (i.e., expressive suppression) and unpleasant emotions. Relatedness need satisfaction was positively related to an adaptive emotion regulation style (i.e., cognitive reappraisal), pleasant emotions, and psychobiosocial experiences, and negatively related to expressive suppression and unpleasant emotions. Finally, mediation analysis showed positive indirect effects from autonomy and relatedness satisfaction to pleasant emotions and psychobiosocial experiences via cognitive reappraisal. Findings suggest that the satisfaction of athletes' basic psychological needs of autonomy and relatedness is related to the experience of pleasant emotions and functional psychobiosocial states when they adopt an adaptive emotion regulation style.

KEYWORDS

self-determination theory, process model of emotion regulation, cognitive reappraisal, expressive suppression, psychobiosocial experiences

1. Introduction

Perceived pressure and dysfunctional emotions are often experienced in many professional, artistic, and sporting contexts where high achievements are at stake (Guyon et al., 2020; Milne and Neely, 2022; Furley et al., 2023). Emotion regulation is crucial to successfully dealing with stressful situations, attaining good performance, and maintaining or improving physical and psychological health (Ruiz and Robazza, 2020). For research and applied purposes, it is therefore important to investigate the antecedents of emotion regulation (such as basic psychological needs satisfaction) and the consequences on emotions and other feelings related to performance.

Gross's (1998, 2014, 2015) process model of emotion regulation has attracted a wide research interest so far and stimulated investigation into individual strategies used to manage the occurrence, intensity, duration, and experience of emotions (Hu et al., 2014). Five families of emotion regulation strategies are hypothesized to intervene at different points in the emotion-generative process, namely, situation selection, situation modification, attention deployment, cognitive change, and response modulation. These emotional regulation processes can involve conscious effort and can also occur without awareness (Gyurak et al., 2011).

Cognitive reappraisal is one of the most investigated antecedent-focused cognitive change strategies of the process model that occurs before the emotional response has been fully activated (Uphill et al., 2012; Balk et al., 2013). An athlete, for example, can reappraise a forthcoming competitive event as a challenge rather than a threat, and perceive the competition as an opportunity to broaden their range of experiences, thereby changing the emotional impact of a previously perceived potentially harmful situation (Lazarus, 2000; Robazza et al., 2008; Sammy et al., 2021). Reappraisal has usually been reported to be an adaptive style associated with high levels of pleasant affect (e.g., Balzarotti et al., 2010; Uphill et al., 2012; Ioannidis and Siegling, 2015), enhanced interpersonal functioning (e.g., Cabello et al., 2013), and well-being (Levin and Rawana, 2022).

Unlike cognitive reappraisal, which is an antecedent-focused strategy, expressive suppression is a response-focused strategy in which an individual exerts effortful control and inhibits emotion response tendencies (Gross and John, 2003). For instance, before a major competition, an athlete may try to hide their apprehension about a possible poor performance to avoid being judged as weak by their coach and teammates. High expressive suppression has generally been considered a maladaptive style linked to dysfunctional emotions (Cece et al., 2019; see Preece et al., 2020).

Researchers specifically examining cognitive reappraisal and expressive suppression use in sport have found that cognitive reappraisal was positively associated with mental well-being (Bird et al., 2023) and greater experiences of pleasant emotions (Uphill et al., 2012). Similar results were reported for young athletes, showing that more favorable levels of outcome variables (i.e., higher pleasant emotions, enjoyment, confidence, satisfaction, social connection, and lower unpleasant emotions and emotional loneliness) were associated with greater use of cognitive reappraisal and less use of expressive suppression (Kim and Tamminen, 2023).

The results of two studies are particularly relevant to the present investigation. In a sample of college students, Benita et al. (2020) examined the effects of integrative emotion regulation (an adaptive emotion regulation style conceptually similar to cognitive reappraisal) and suppressive emotion regulation (a maladaptive style) on well-being. Along with the process model of emotion regulation (Gross, 1998, 2015), Benita et al.'s study relied on the basic psychological needs theory as conceptualized within the broader framework of the self-determination theory (Ryan and Deci, 2017, 2020). The basic psychological needs theory underscores the importance of satisfying the three basic psychological needs for competence, autonomy, and relatedness to enhance individual motivation and well-being (Ryan and Deci, 2017; Vansteenkiste et al., 2023). According to Ryan and Vansteenkiste (2023), these three needs are central to self-determination theory that was "…initially focused on intrinsic motivational processes, with intrinsic motivation defined as activity that is motivated (energized and directed) by its inherent satisfactions." (p. 9). Intrinsic motivation for any activity requires a sense of autonomy (feeling in control of one's own life), competence (feeling capable of completing a task), and relatedness (feeling part of a caring environment). When these needs are met, people are more likely to be intrinsically motivated.

Competence is conceived as a perception of mastery, a belief that one can progress and succeed. It is fulfilled in contexts that offer optimal challenges, positive feedback, and opportunities for growth. Competence frustration can lead to feelings of failure and helplessness, especially when an individual is struggling to learn or master a task. Autonomy refers to a feeling of initiative and control over one's actions. It is enhanced by the perception of interest and value in one's initiatives, while it is undermined by experiences of external control. Autonomy frustration involves a sense of pressure and inner conflict, a feeling of being pushed in an undesired direction, and a lack of consideration for one's own preferences and choices. Relatedness refers to a sense of belonging and connection, which is enhanced by the expression of respect and consideration. When this need is frustrated, it leads to feelings of social isolation, exclusion, and loneliness (Vansteenkiste et al., 2020; Vansteenkiste and Soenens, 2023). Empirical evidence supports the conceptual distinction between need satisfaction and need frustration, indicating that both sets of experiences are distinct and negatively correlated (see Vansteenkiste et al., 2023). Benita et al. (2020) showed that the satisfaction of the three basic psychological needs was positively related to integrative emotion regulation and well-being, while the frustration of the same basic psychological needs was positively linked to suppressive emotion regulation and negatively associated with well-being. The results align with a growing body of research in sport that confirms (a) a positive relationship between basic needs satisfaction and adaptive sport outcomes, such as intrinsic motivation, enjoyment, well-being, physical health, behavioral engagement, and improved performance, and (b) a negative relationship between need satisfaction and maladaptive outcomes, such as burnout, exhaustion, disaffection, and unpleasant emotions (for reviews, see Schüler et al., 2023; Standage, 2023).

In a study with a sample of athletes, Robazza et al. (2022) investigated the relationships between athletes' perceived motivational climate created by the coach, emotion regulation strategies, pleasant and unpleasant emotions (i.e., excitement, happiness, anxiety, dejection, and anger; Jones et al., 2005), and discrete emotion-related (i.e., psychobiosocial) experiences that are perceived as functional for performance (Robazza et al., 2021). Theoretical frameworks were the achievement goal theory (Nicholls, 1984), which shares assumptions

and notions with basic psychological needs theory (Ryan and Deci, 2017), process model of emotion regulation (Gross, 1998), and individual zones of optimal functioning (IZOF) model (Hanin, 2007). Drawing from the IZOF model, individual psychobiosocial experiences (or states) are described as consisting of psychological (e.g., unpleasant/pleasant emotion, confidence, motivation), biological (e.g., bodily responses), and social dimensions (e.g., social support; see Robazza et al., 2021; Ruiz et al., 2021b). Psychobiosocial experiences reflect the range of emotional and non-emotional manifestations of athletes' functioning in practice and competition (for reviews, see Ruiz and Robazza, 2020). Robazza et al. (2022) found that athletes' perceived mastery climate, in which the coach values individual efforts, task commitment, and improvements, was positively linked to cognitive reappraisal, pleasant emotions (i.e., excitement and happiness), and psychobiosocial experiences that were perceived as functional for performance. In contrast, athletes' perceived performance climate, where the emphasis is placed on winning and outperforming others, was positively associated with expressive suppression and unpleasant emotions (i.e., dejection and anger). Importantly, structural equation modeling showed positive indirect effects via reappraisal in the relation between perceived mastery climate and pleasant emotions/functional experiences. Positive indirect effects through expressive suppression were also observed in the relation between performance climate and unpleasant emotions.

1.1. Study purpose

Studies focusing specifically on cognitive reappraisal and expressive suppression in sport are scarce, even though Gross's (1998, 2015) process model represents a prominent approach to emotion regulation. Furthermore, the role of emotion regulation in the relationship between satisfaction of basic psychological needs and emotions with their associated manifestations (i.e., psychobiosocial experiences), has not yet been studied. The present study aimed to fill this gap in the literature by focusing on athletes' perception of psychological needs satisfaction, emotion regulation, and emotional outcomes. Specifically, based on the results of Benita et al. (2020) and Robazza et al. (2022), the main aim of this investigation was to examine the role of athletes' emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) in the relationship between basic psychological needs satisfaction, selected emotions (i.e., happiness, excitement, anxiety, dejection, and anger), and a broad range of psychobiosocial experiences that are perceived as functional for performance. Examining relevant antecedents (i.e., basic psychological needs satisfaction) and adaptive outcomes of emotion regulation (i.e., emotions and psychobiosocial experiences) can contribute to the extant knowledge on the process model and provide practical indications to improve athletes' well-being and performance.

Drawing from the tenets of the basic psychological needs theory (Ryan and Deci, 2017), the process model of emotion regulation (Gross, 1998), and the IZOF model conceptualization of psychobiosocial states (Hanin, 2007), we predicted that basic psychological needs satisfaction would be positively related to cognitive reappraisal, pleasant emotions (i.e., happiness, excitement), and functional psychobiosocial experiences, and negatively linked to expressive suppression and unpleasant emotions (anxiety, dejection, and anger; Hypothesis 1). Cognitive reappraisal was predicted to be positively associated with pleasant emotions/functional experiences and negatively linked to unpleasant emotions. Expressive suppression was expected to be negatively related to pleasant emotions/functional experiences and positively linked to unpleasant emotions (Hypothesis 2). Most importantly for the present study, we expected to observe indirect effects in the relationship between basic psychological needs and pleasant emotions, as well as between basic needs and functional experiences, via cognitive reappraisal (Hypothesis 3).

2. Method

2.1. Participants

The initial sample consisted of 430 competitive athletes from the main sport clubs in central Italy. After outlier removal, the final sample ($N = 424$) encompassed 246 men (89 from individual sports and 157 from team sports) and 178 women (75 from individual sports and 103 from team sports), aged 16 to 36 years ($M = 23.08$, $SD = 7.65$). The athletes had between 1 to 21 years of competitive experience ($M = 9.71$, $SD = 6.34$) at regional level (71%), national level (18%), or international level (11%). They were involved in individual sports ($n = 164$; e.g., fencing, gymnastics, martial arts, swimming, and tennis) or team sports ($n = 260$; e.g., basketball, rugby, soccer, and volleyball; see Supplementary Table 1). The participants practiced their sport an average of 3.74 times a week ($SD = 1.73$).

2.2. Measures

2.2.1. The Basic Needs Satisfaction in Sport Scale

The Basic Needs Satisfaction in Sport Scale (BNSSS; Ng et al., 2011) is intended to assess Competence, Autonomy-choice, Internal perceived locus of causality, Volition, and Relatedness. The focus of the current study was on the three basic psychological needs of competence, autonomy, and relatedness. Therefore, we used the subscales of Competence (5 items; e.g., "I am skilled at my sport"), Autonomy-choice (4 items; e.g., "In my sport, I get opportunities to make decisions"), and Relatedness (5 items; e.g., "In my sport, there are people who I can trust"). Responses are rated on a 7-point Likert scale ranging from 1 (*not true at all*) to 7 (*very true*). Previous research by Morano et al. (2020a) supported the factor structure of the Italian version of the scale administered to a sample of athletes, showing acceptable internal consistency (ω coefficients) for Competence (0.835), Autonomy-choice (0.831), and Relatedness (0.805).

2.2.2. The Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire (ERQ; Gross and John, 2003) was developed to assess the use of cognitive reappraisal (6 items; e.g., "I control my emotions by changing the way I think about the situation I'm in") and expressive suppression (4 items, e.g., "When I am feeling negative emotions, I make sure not to express them") in samples of undergraduate students. The original stem of the items was modified from "how you control (that is, regulate and manage) your emotions" to "how you control (that is, regulate and manage) your emotions in your sporting context." Ratings were provided on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much*). Previous

research has supported the factor structure of the Italian version of the scale administered to athletes, showing good internal consistency with ω values of 0.785 for reappraisal and 0.648 for suppression (Robazza et al., 2022).

2.2.3. The Sport Emotion Questionnaire

The Sport Emotion Questionnaire (SEQ; Jones et al., 2005) measures the intensity of athletes' precompetitive anxiety (5 items; e.g., "apprehensive"), dejection (5 items; e.g., "unhappy"), anger (4 items; e.g., "annoyed"), excitement (4 items; e.g., "enthusiastic"), and happiness (4 items; e.g., "joyful"). Ratings on a 5-point scale range from 0 (*not at all*) to 4 (*extremely*). The factor structure and reliability (α range = 0.741–0.863, composite reliability range = 0.742–0.864) were supported for the Italian version of the scale administered to athletes (Robazza et al., 2016). In the present study, we modified the question "how you feel right now, at this moment, in relation to the upcoming competition" (Jones et al., 2005) to "how you usually feel before an important competition."

2.2.4. The Psychobiosocial Experience Semantic Differential scale in Sport

The Psychobiosocial Experience Semantic Differential scale in Sport (PESD-Sport; Robazza et al., 2021) comprises 30 bipolar items loading into 10 subscales (3 items each) to assess the psychological, bodily, and social modalities of psychobiosocial experiences. The psychological modality includes: emotion u/p (unpleasant/pleasant; e.g., "unhappy–happy"), confidence (e.g., "unconfident–confident"), anxiety (e.g., "worried in a harmful way–worried in a helpful way"), assertiveness (e.g., "submissive–fighting spirit"), and cognitive (e.g., "distracted–alert") items. The bodily modality encompasses: bodily-somatic (e.g., "physically weak–physically vigorous") and motor-behavioral (e.g., "uncoordinated in my movements–coordinated in my movements") items. The social modality contains: operational (e.g., "ineffective in my performance–effective in my performance"), communicative (e.g., "being communicative is harmful–being communicative is useful"), and social support (e.g., "I feel ignored–I feel considered") items. Each item is anchored by an adjective and its antonym in a semantic differential format. Dysfunctional adjectives for performance are on the left of a Likert-type scale while functional antonyms are on the right. Thinking about "how you usually feel before an important competition," items are scored on a bipolar Likert-type scale ranging from 4 (*very much*) to 0 (*neither … nor*) on the "dysfunctional" side and from 0 to 4 on the "functional" side. Ratings on the dysfunctional side are then transformed into negative scores. Support for the factor structure and reliability was found in a sample of Italian athletes (Robazza et al., 2021), with ω values ranging from 0.740 (communicative) to 0.875 (social support).

2.3. Procedure

The study was carried out in accordance with the Declaration of Helsinki and was approved by the first author's institutional ethics committee (No. 19, 09/09/2021). Participants were recruited by directly approaching sport club managers and head coaches, sending them a study information letter via email followed by telephone contact. After agreement to participate was granted, the general aim of the study and detailed procedures were presented in a meeting with sport managers and coaches before contacting the athletes. The criteria for participation in the study required that the athletes be currently active, practiced at least twice a week, have a minimum of 6 months experience of regular training in the sport, compete consistently during the sporting season, and be at least 16 years old. Before providing informed consent, the athletes were informed about the general objective of the study, the voluntary nature of participation, the possibility to withdraw from the study at any time without consequences, and the confidentiality of their responses. Informed parental consent was obtained for participants under the age of 18. The questionnaires were completed individually in a quiet room prior to a practice session, with an investigator administering the questionnaires in groups of no more than five participants.

2.4. Data analysis

After data screening for potential outliers, assumptions of normality, linearity, multicollinearity, and homoscedasticity (Hair et al., 2019), we examined the factorial validity of the measures through confirmatory factor analysis (CFA) performed in M*plus* 8.5 (Muthén and Muthén, 2017) using the maximum likelihood (MLR) parameter estimator with standard errors and a chi-square test statistic that are robust to non-normality. Model fit was assessed with comparative fit index (CFI), Tucker Lewis fit index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Adequate fit was inferred with values of CFI and TLI > 0.90, and RMSEA and SRMR lower than 0.08 (Whittaker and Schumacker, 2022). Good fit was assumed with CFI and TLI values close or higher to 0.95, and RMSEA and SRMR lower than 0.06 (Hu and Bentler, 1999).

McDonald's ω values were computed to assess reliability of the measures. Convergence among a set of items representing a latent construct of the whole measurement model was examined through the average variance extracted (AVE) of the latent variables. AVE values close to or larger than 0.50 are deemed to support convergent validity of the measurement model (Hair et al., 2019). Furthermore, discriminant validity was established by comparing the AVE estimates of each factor with the squared interconstruct correlations related to that factor. Discriminant validity is assumed when AVE estimates are greater than the corresponding interconstruct squared correlation values (Hair et al., 2019).

Differences by gender and sport categories (i.e., individual vs. team) on the item mean scores of the dependent variables (i.e., the subscales of the measures) were evaluated through multivariate analysis of variance (MANOVA). Without previous evidence in support of an expected effect size for *a priori* power calculation, Kang and Jin (2016) recommended using a medium effect size with an alpha of 0.05 and an expected power of 0.80. The sample size was estimated using G*Power software (Version 3.1.9.7; Faul et al., 2009), with $f = 0.25$ (medium effect size), $\beta = 0.80$, and $\alpha = 0.05$. The resulting recommended sample size was 330, so the initial sample size of 430 participants in our study was adequate.

Finally, structural equation modeling (SEM) was performed in M*plus* to test the indirect effects in the relationship between basic psychological needs and emotions/functional experiences via emotion regulation strategies. Mediation effects were tested using the maximum likelihood (ML) estimator and the bias-corrected bootstrap

method based on 5,000 resamples with a 95% confidence interval around the standardized estimate (β). The sample size for SEM was established using the root mean square error of approximation (RMSEA; Myers et al., 2016). The minimum sample size for RMSEA was computed using the code developed by Preacher and Coffman (2006) for the R program (https://cran.r-project.org/). A sample size of 195 resulted after setting the type I error rate to $\alpha = 0.05$, power = 0.80, null RMSE = 0.05, alternative RMSE = 0.04, and $df = 729$. Again, the sample size in the present study was adequate.

3. Results

3.1. Confirmatory factor analysis

Six cases were discarded because identified as univariate or multivariate outliers (Mahalanobis' distance, $p < 0.001$). The final sample consisted of 424 participants. CFA on the BNSSS, ERQ, and SEQ data did not yield an acceptable fit, as reflected by poor loadings (< 0.40) of some items in the expected factor or cross-loadings. After the removal of problematic items, an acceptable fit to the data was obtained (Table 1) with values for comparative fit (CFI) and Tucker Lewis fit (TLI) indices >0.92, RMSEA and standardized root mean square residuals (SRMR) < 0.06 (Gunzler et al., 2021). McDonald's ω reliability values ranged from 0.66 to 0.89. An acceptable fit to the data was also observed for the two measurement models relating the first to BNSSS, ERQ, and SEQ, and the second to BNSSS, ERQ, and PESD-Sport (Table 1). Acceptable convergent validity of the measurement model encompassing all measures was found, with most AVE values close to or above 0.50 (Table 1). In addition, adequate discriminant validity was observed after taking the lowest AVE value among the factors (i.e., 0.339 for Expressive suppression) as a reference. In fact, the AVE estimates were greater than the squared correlations between two latent factors for 160 of the 190 correlations.

3.2. Descriptive and inferential statistics

Descriptive statistics and correlation coefficients of latent variables are reported in Table 2. An inspection of correlation coefficients showed that (a) Competence was positively related to pleasant emotions (i.e., Excitement and Happiness), and psychobiosocial experiences, except for the Communicative modality, and negatively related to Expressive suppression and unpleasant emotions (i.e., Anxiety, Dejection, and Anger); (b) Autonomy was positively associated with Cognitive reappraisal; (c) Relatedness was positively linked to Cognitive reappraisal, pleasant emotions, and psychobiosocial experiences, except for Anxiety and Communicative modalities, and negatively linked to Expressive suppression, Dejection, and Anger; (d) Cognitive reappraisal was positively associated with pleasant emotions and Psychobiosocial Experiences, except for the Communicative modality; and (e) Expressive suppression was positively associated with Dejection, Anger, and the Communicative modality of psychobiosocial experiences, and negatively associated with Emotion u/p. All correlations were in the expected direction, except for Expressive suppression, which was significantly correlated with the Communicative modality of psychobiosocial experiences.

MANOVA yielded significant differences by gender, sport type, and gender by sport type interaction. The complete results are presented in the Supplementary materials, and follow-up comparisons are reported in Supplementary Table 2. To account for these differences, gender, sport type, and gender by sport type interaction were entered as covariates into subsequent SEM analyses.

3.3. Structural equation modeling

3.3.1. Basic psychological needs, emotion regulation, and emotions

SEM results regarding the relationships between basic needs satisfaction, emotion regulation strategies, and sport emotions showed that Competence was positively related to Excitement and Happiness, and negatively linked to Expressive suppression, Anxiety, Dejection, and Anger. Autonomy and Relatedness were positively related to Cognitive reappraisal. Relatedness was also positively associated with Excitement and Happiness, and negatively linked to Expressive suppression, Dejection, and Anger (Table 3 and Figure 1). Furthermore, Cognitive reappraisal was positively linked to Excitement and Happiness. Mediation analysis showed positive indirect effects from Autonomy and Relatedness to Excitement and Happiness via Cognitive reappraisal (Supplementary Table 3).

3.3.2. Basic psychological needs, emotion regulation, and psychobiosocial experiences

SEM results on the relationships between basic needs satisfaction, emotion regulation strategies, and the modalities of psychobiosocial experiences showed that Competence and Relatedness were positively linked to most modalities of psychobiosocial experiences. Additionally, Autonomy and Relatedness were positively associated with Cognitive reappraisal, while Competence was negatively related to Expressive suppression. Cognitive reappraisal was positively linked to all modalities of psychobiosocial experiences except for the Communicative modality which was positively linked to Expressive suppression (Table 4 and Figure 2).

Mediation analysis revealed positive indirect effects through Cognitive reappraisal from Autonomy and Relatedness to most modalities: Emotion u/p, Confidence, Anxiety, Assertiveness, Cognitive, Bodily-somatic, Motor-behavioral, Operational, and Social support. Moreover, negative indirect effects through expressive suppression were observed from Competence and Relatedness to the Communicative modality (Supplementary Table 4).

4. Discussion

In this study, we investigated the role of athletes' emotion regulation strategies in the relationship between basic psychological needs satisfaction, emotions, and functional psychobiosocial experiences, following the tenets of the basic psychological needs theory (Ryan and Deci, 2017), the process model of emotion regulation (Gross, 1998, 2014), and the IZOF model conceptualization of psychobiosocial states (Hanin, 2007). Taken as a whole, the findings concur with and extend those of a previous study framed within the achievement goal theory (Nicholls, 1984), in which the perceived motivational climate (i.e., mastery and performance) created by the

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TABLE 1 Confirmatory factor analysis fit indices and reliability values of the measures and measurement models.

Measure	Factor (number of items)	χ^2/df	CFI	TLI	RMSEA (90% CI)	SRMR	ω	AVE
BNSSS		2.501	0.954	0.932	0.059 (0.041–0.079)	0.048		
	Competence (3)						0.659	0.400
	Autonomy-choice (3)						0.738	0.507
	Relatedness (3)						0.815	0.599
ERQ		1.403	0.981	0.973	0.031 (0.000–0.053)	0.035		
	Cognitive reappraisal (5)						0.741	0.371
	Expressive suppression (4)						0.667	0.339
SEQ		1.835	0.942	0.931	0.044 (0.036–0.052)	0.053		
	Anxiety (4)						0.808	0.506
	Dejection (5)						0.802	0.463
	Anger (3)						0.668	0.417
	Excitement (4)						0.805	0.504
	Happiness (4)						0.879	0.645
PESD-Sport		1.884	0.940	0.928	0.046 (0.040–0.051)	0.041		
	Emotion u/*p* (3)						0.854	0.661
	Confidence (3)						0.805	0.575
	Anxiety (3)						0.822	0.606
	Assertiveness (3)						0.786	0.549
	Cognitive (3)						0.836	0.642
	Bodily-somatic (3)						0.853	0.662
	Motor-behavioral (3)						0.815	0.583
	Operational (3)						0.831	0.629
	Communicative (3)						0.768	0.522
	Social support (3)						0.890	0.724
[1]BNSSS, ERQ, SEQ		1.475	0.934	0.925	0.033 (0.029–0.038)	0.051		
[1]BNSSS, ERQ, PESD-Sport		1.541	0.934	0.924	0.036 (0.032–0.039)	0.043		

BNSSS, Basic Needs Satisfaction in Sport Scale; ERQ, Emotion Regulation Questionnaire; SEQ, Sport Emotion Questionnaire; PESD-Sport, Psychobiosocial Experience Semantic Differential scale in Sport; χ^2/df, chi-square/degrees of freedom; CFI, comparative fit index; TLI, Tucker Lewis fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; McDonald's ω, omega values; AVE, average variance extracted. [1]Measurement model.

coach was antecedent of emotion regulation strategies and emotions/functional experiences (Robazza et al., 2022).

4.1. Hypothesis 1: basic psychological needs → emotion regulation, and emotions/psychobiosocial experiences

Hypothesis 1 was partially supported, with autonomy and relatedness need satisfaction (but not competence) positively related to cognitive reappraisal, and competence and relatedness need satisfaction (but not autonomy) negatively linked to expressive suppression. Moreover, competence and relatedness were associated positively with pleasant emotions and negatively with unpleasant emotions. Competence and relatedness were positively related to most modalities of psychobiosocial experiences, likely due to the positive mean scores observed on all modalities across gender and sport type. Positive scores on all modalities had previously been observed in two samples of athletes (Robazza et al., 2021), indicating that the PESD-Sport mainly assesses functional experiences.

The results concur with previous research indicating that the satisfaction of athletes' basic psychological needs was positively

TABLE 2 Descriptive statistics for women and men involved in individual and team sports, and correlation coefficients of latent variables for the whole sample (N=424).

	Women		Men																			
	Individual (n=75)	Team (n=103)	Individual (n=89)	Team (n=157)																		
Variable	$M \pm SD$	$M \pm SD$	$M \pm SD$	$M \pm SD$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Basic psychological needs																							
1. Competence	4.95 ± 1.10	4.98 ± 1.38	5.05 ± 1.39	4.94 ± 1.35	––																		
2. Autonomy	4.85 ± 1.42	3.53 ± 1.37	4.92 ± 1.55	3.98 ± 1.33	0.05	––																	
3. Relatedness	5.53 ± 1.17	5.59 ± 1.28	5.90 ± 1.15	5.27 ± 1.28	0.21*	0.16	––																
Emotion regulation																							
4. Cognitive reappraisal	2.53 ± 0.71	2.54 ± 0.61	2.74 ± 0.62	2.69 ± 0.52	0.17	0.27*	0.22*	––															
5. Expressive suppression	2.09 ± 0.63	2.22 ± 0.75	2.27 ± 0.63	2.49 ± 0.62	−0.25*	−0.05	−0.23*	0.03	––														
Sport emotions																							
6. Anxiety	2.13 ± 0.97	1.66 ± 0.81	1.34 ± 0.80	1.48 ± 0.83	−0.22*	−0.05	−0.03	−0.15	0.07	––													
7. Dejection	0.36 ± 0.53	0.29 ± 0.42	0.20 ± 0.40	0.53 ± 0.68	−0.45§	−0.04	−0.29*	−0.14	0.24*	0.32*	––												
8. Anger	0.40 ± 0.68	0.51 ± 0.69	0.37 ± 0.61	0.76 ± 0.83	−0.33*	−0.09	−0.27*	−0.04	0.20*	0.36*	0.79†	––											
9. Excitement	2.59 ± 0.89	2.81 ± 0.73	2.59 ± 0.84	2.73 ± 0.88	0.25*	0.10	0.27*	0.38*	−0.16	0.08	−0.31*	−0.08	––										
10. Happiness	2.56 ± 0.96	2.92 ± 0.81	2.69 ± 0.87	2.74 ± 0.95	0.26*	0.08	0.33*	0.36*	−0.16	−0.16	−0.31*	−0.24*	0.90#	––									
Psychobiosocial experiences																							
11. Emotion u/p	2.29 ± 1.32	2.76 ± 1.15	2.74 ± 1.31	2.56 ± 1.43	0.36*	0.13	0.42§	0.39*	−0.24*	−0.18	−0.43§	−0.30*	0.60†	0.68†	––								
12. Confidence	1.36 ± 1.59	2.05 ± 1.34	2.26 ± 1.21	2.27 ± 1.41	0.43§	0.11	0.33*	0.39*	−0.15	−0.41§	−0.36*	−0.13	0.53§	0.55§	0.81#	––							
13. Anxiety	0.87 ± 1.68	1.11 ± 1.62	1.30 ± 1.55	1.52 ± 1.46	0.32*	0.16	0.09	0.37*	−0.12	−0.25*	−0.18	−0.02	0.39*	0.37*	0.55§	0.73†	––						
14. Assertiveness	2.10 ± 1.46	2.67 ± 1.16	2.66 ± 0.91	2.59 ± 1.36	0.35*	0.04	0.25*	0.35*	−0.13	−0.13	−0.30*	−0.06	0.64†	0.48§	0.73†	0.80#	0.63†	––					
15. Cognitive	2.43 ± 1.24	2.54 ± 1.15	2.69 ± 1.21	2.49 ± 1.42	0.25*	0.11	0.20*	0.22*	0.00	−0.13	−0.23*	−0.21*	0.38*	0.31*	0.56§	0.61†	0.51§	0.68†	––				
16. Bodily-somatic	1.95 ± 1.59	2.36 ± 1.18	2.59 ± 1.19	2.38 ± 1.49	0.26*	0.06	0.21*	0.33*	0.02	−0.13	−0.19	−0.05	0.55§	0.45§	0.71†	0.70†	0.52§	0.79†	0.60†	––			
17. Motor-behavioral	2.15 ± 1.29	2.09 ± 1.26	2.54 ± 1.04	2.46 ± 1.29	0.28*	0.08	0.21*	0.31*	−0.10	−0.15	−0.25*	−0.15	0.45§	0.34*	0.58§	0.69†	0.56§	0.67†	0.74†	0.81#	––		
18. Operational	1.84 ± 1.42	2.05 ± 1.16	2.23 ± 1.25	2.27 ± 1.33	0.35*	0.09	0.23*	0.32*	−0.10	−0.20*	−0.24*	−0.12	0.53§	0.48§	0.68†	0.83#	0.70†	0.71†	0.72†	0.79†	0.92#	––	
19. Communicative	0.44 ± 1.44	0.08 ± 1.82	0.58 ± 1.61	0.82 ± 1.68	−0.08	0.05	−0.19	−0.04	0.46§	−0.05	0.17	0.20*	−0.08	−0.03	0.01	0.17	0.28*	0.09	0.24*	0.20*	0.23*	0.16	––
20. Social support	2.20 ± 1.40	2.43 ± 1.47	2.62 ± 1.11	2.24 ± 1.56	0.33*	0.17	0.48§	0.31*	−0.19	−0.14	−0.35*	−0.22*	0.46§	0.47§	0.83#	0.68†	0.45§	0.53§	0.57§	0.54§	0.53§	0.61†	0.03

Correlation *low, §moderate, †moderately high #high (Zhu, 2012).

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TABLE 3 Standardized estimates and 95% confidence intervals from structural equation modeling results of the relationships between basic needs (competence, autonomy, and relatedness), emotion regulation strategies (cognitive reappraisal and expressive suppression), and emotions.

Relationship	Lower 2.5%	Estimate	Upper 2.5%
Competence → Cognitive reappraisal	−0.004	0.128	0.259
Autonomy → Cognitive reappraisal	0.086	0.215*	0.344
Relatedness → Cognitive reappraisal	0.068	0.184*	0.299
Competence → Expressive suppression	−0.376	−0.230*	−0.084
Autonomy → Expressive suppression	−0.179	−0.047	0.084
Relatedness → Expressive suppression	−0.309	−0.184*	−0.060
Competence → Excitement	0.023	0.142*	0.262
Autonomy → Excitement	−0.144	−0.034	0.077
Relatedness → Excitement	0.025	0.151*	0.276
Cognitive reappraisal → Excitement	0.220	0.335*	0.450
Expressive suppression → Excitement	−0.248	−0.112	0.024
Competence → Happiness	0.026	0.149*	0.271
Autonomy → Happiness	−0.159	−0.055	0.049
Relatedness → Happiness	0.104	0.225*	0.345
Cognitive reappraisal → Happiness	0.183	0.298*	0.413
Expressive suppression → Happiness	−0.225	−0.096	0.033
Competence → Anxiety	−0.317	−0.180*	−0.043
Autonomy → Anxiety	−0.112	0.014	0.140
Relatedness → Anxiety	−0.111	0.019	0.149
Cognitive reappraisal → Anxiety	−0.218	−0.084	0.049
Expressive suppression → Anxiety	−0.064	0.081	0.226
Competence → Dejection	−0.510	−0.396*	−0.282
Autonomy → Dejection	−0.099	0.005	0.110
Relatedness → Dejection	−0.327	−0.198*	−0.068
Cognitive reappraisal → Dejection	−0.183	−0.052	0.079
Expressive suppression → Dejection	−0.067	0.078	0.222
Competence → Anger	−0.449	−0.294*	−0.139
Autonomy → Anger	−0.163	−0.015	0.133
Relatedness → Anger	−0.364	−0.216*	−0.069
Cognitive reappraisal → Anger	−0.078	0.062	0.202
Expressive suppression → Anger	−0.091	0.063	0.217

*$p < 0.05$.

associated with enjoyment (e.g., Jaakkola et al., 2016), optimal social functioning, well-being, and self-development (e.g., Cheval et al., 2017), and negatively related to burnout and ill-being (e.g., Balaguer et al., 2012; for a review, see Raabe et al., 2019). Findings also complement those of Robazza et al. (2022), who found that perceived mastery climate was positively associated with cognitive reappraisal and pleasant emotions/functional experiences. The results of the previous and the present study taken together suggest that a mastery motivational climate, as conceived within goal achievement theory, and the satisfaction of basic psychological needs, as conceptualized within self-determination theory, are associated with adaptive emotions and emotion-related experiences. In this regard, Duda (2013) combined the theoretical notions and applied indications stemming from the two theoretical perspectives within the so-called

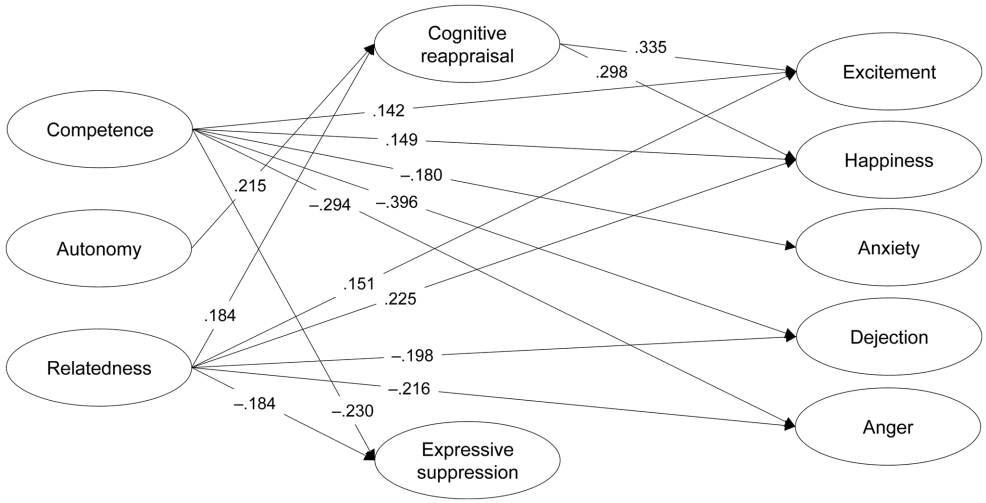

FIGURE 1
Structural equation model illustrating the relationships between basic needs (competence, autonomy, and relatedness), emotion regulation strategies (cognitive reappraisal and expressive suppression), and emotions, controlling for gender, sport type, and gender by sport type interaction (covariates not shown for the sake of clarity). Only significant standardized estimates are presented ($p < 0.05$).

"Empowering Coaching" program, which aims to help coaches create a more empowering motivational climate, assumed to satisfy athletes' psychological needs and promote their quality of engagement in sport and overall health (Duda and Appleton, 2016; for a review, see Birr et al., 2023). In a sample of British athletes, Ruiz et al. (2021a) reported direct and indirect effects of an empowering climate to happiness and excitement via autonomous motivation, and of a disempowering climate to dejection and anger via controlled motivation. The results from the current study are in line with this hierarchical conceptualization of the motivational climate and previous research findings.

4.2. Hypothesis 2: emotion regulation → emotions/psychobiosocial experiences

Hypothesis 2 was also partially supported, with cognitive reappraisal being positively linked to pleasant emotions and most psychobiosocial experiences. The results align with research findings from the general population of predominantly Western cultural background (e.g., Gross and John, 2003; Preece et al., 2020) and with athletic samples (Cece et al., 2019), indicating that the antecedent-focused strategy of cognitive reappraisal is usually associated with pleasant affect (e.g., Balzarotti et al., 2010; Ioannidis and Siegling, 2015). Interestingly, the correlation between the cognitive reappraisal and expressive suppression scores was close to zero, suggesting that these are two independent regulatory strategies (John and Eng, 2014).

The pattern of correlations between expressive suppression and emotions was as expected (i.e., negative with pleasant emotions and positive with unpleasant emotions), although the only significant correlations were found with dejection and anger. Regarding psychobiosocial experiences, expressive suppression correlated negatively with most modalities as predicted, although the only significant correlations were observed with the emotion u/p and communicative modalities. Interestingly, the correlation with the communicative modality was positive, as also found in Robazza et al.'s (2022) study, indicating that communication with significant others (e.g., coaches and peers) may be facilitated when the athletes' externalization of unpleasant experiences is inhibited.

Finally, the lack of a significant correlation between scores of expressive suppression and anxiety may be interpreted in light of research evidence showing that anxiety symptoms can be appraised not only as debilitative, but also as facilitative, depending on the individual's perceived impact on performance (Jones et al., 1994; Neil et al., 2012). Indeed, symptoms such as increased heart rate and muscle tension during competition, while unpleasant, may be perceived by the athlete as helpful in energizing their behavior and keeping their attention focused on the task. Therefore, athletes who appraise their anxiety symptoms as helpful may not need to suppress them.

4.3. Hypothesis 3: basic psychological needs → emotion regulation → emotions/psychobiosocial experiences

Regarding Hypothesis 3, findings support the expected indirect effects of emotion regulation strategies on the relationship between autonomy and relatedness needs satisfaction and pleasant emotions (i.e., happiness and excitement), as well as most modalities of psychobiosocial experiences via cognitive reappraisal. These findings align with and extend those of an earlier study, which showed that perceived mastery climate had positive indirect effects on psychobiosocial experiences through cognitive reappraisal (Robazza et al., 2022). This is as one would expect, considering that in a mastery climate, the coach's attention is on individual criteria of success and positive interactions with peers, rather than on external criteria of success and outperforming others. The results of the current study, as well as existing empirical evidence, support the view that a coach-created empowering motivational climate (Duda and Appleton, 2016),

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TABLE 4 Standardized estimates and 95% confidence intervals from structural equation model results of the relationships between basic needs (competence, autonomy, and relatedness), emotion regulation strategies (cognitive reappraisal and expressive suppression), and psychobiosocial experiences.

Relationship	Lower 2.5%	Estimate	Upper 2.5%
Competence → Cognitive reappraisal	−0.015	0.120	0.255
Autonomy → Cognitive reappraisal	0.085	0.214*	0.343
Relatedness → Cognitive reappraisal	0.071	0.187*	0.302
Competence → Expressive suppression	−0.381	−0.233*	−0.086
Autonomy → Expressive suppression	−0.177	−0.046	0.084
Relatedness → Expressive suppression	−0.311	−0.187*	−0.064
Competence → Emotion u/p	0.122	0.235*	0.348
Autonomy → Emotion u/p	−0.130	−0.020	0.090
Relatedness → Emotion u/p	0.176	0.298*	0.420
Cognitive reappraisal → Emotion u/p	0.192	0.303*	0.415
Expressive suppression → Emotion u/p	−0.257	−0.129	−0.001
Competence → Confidence	0.212	0.339*	0.466
Autonomy → Confidence	−0.150	−0.035	0.079
Relatedness → Confidence	0.094	0.218*	0.342
Cognitive reappraisal → Confidence	0.176	0.294*	0.411
Expressive suppression → Confidence	−0.175	−0.053	0.069
Competence → Anxiety	0.122	0.249*	0.376
Autonomy → Anxiety	−0.075	0.048	0.171
Relatedness → Anxiety	−0.165	−0.045	0.075
Cognitive reappraisal → Anxiety	0.206	0.329*	0.452
Expressive suppression → Anxiety	−0.222	−0.086	0.050
Competence → Assertiveness	0.144	0.269*	0.394
Autonomy → Assertiveness	−0.206	−0.084	0.038
Relatedness → Assertiveness	0.018	0.152*	0.285
Cognitive reappraisal → Assertiveness	0.180	0.296*	0.412
Expressive suppression → Assertiveness	−0.167	−0.038	0.091
Competence → Cognitive	0.111	0.232*	0.353
Autonomy → Cognitive	−0.075	0.049	0.173
Relatedness → Cognitive	0.022	0.148*	0.273
Cognitive reappraisal → Cognitive	0.022	0.138*	0.254
Expressive suppression → Cognitive	−0.039	0.088	0.215
Competence → Bodily-somatic	0.107	0.218*	0.329
Autonomy → Bodily-somatic	−0.142	−0.035	0.073
Relatedness → Bodily-somatic	0.023	0.141*	0.260
Cognitive reappraisal → Bodily-somatic	0.163	0.270*	0.378
Expressive suppression → Bodily-somatic	−0.026	0.094	0.215

(Continued)

TABLE 4 (Continued)

Relationship	Lower 2.5%	Estimate	Upper 2.5%
Competence → Motor-behavioral	0.074	0.209*	0.344
Autonomy → Motor-behavioral	−0.148	−0.020	0.108
Relatedness → Motor-behavioral	−0.016	0.119	0.254
Cognitive reappraisal → Motor-behavioral	0.125	0.248*	0.371
Expressive suppression → Motor-behavioral	−0.171	−0.039	0.092
Competence → Operational	0.162	0.292*	0.422
Autonomy → Operational	−0.137	−0.015	0.106
Relatedness → Operational	−0.010	0.128	0.265
Cognitive reappraisal → Operational	0.130	0.256*	0.381
Expressive suppression → Operational	−0.124	0.002	0.128
Competence → Communicative	−0.076	0.058	0.192
Autonomy → Communicative	−0.015	0.101	0.218
Relatedness → Communicative	−0.205	−0.082	0.040
Cognitive reappraisal → Communicative	−0.225	−0.088	0.049
Expressive suppression → Communicative	0.299	0.446*	0.593
Competence → Social support	0.107	0.228*	0.349
Autonomy → Social support	−0.049	0.057	0.163
Relatedness → Social support	0.270	0.391*	0.511
Cognitive reappraisal → Social support	0.065	0.181*	0.298
Expressive suppression → Social support	−0.176	−0.054	0.068

*$p < 0.05$.

characterized by the satisfaction of individual basic needs of competence, autonomy, and relatedness (Ryan and Deci, 2017) in a mastery climate (Nicholls, 1984), is accompanied by adaptive emotion regulation (i.e., cognitive reappraisal), pleasant emotions, and functional psychobiosocial experiences. In addition, negative indirect effects emerged from competence and relatedness to the communicative modality of psychobiosocial experiences through expressive suppression. As previously noted, this may be due to the positive correlation between expressive suppression and the communicative modality, suggesting that communication may be improved when the athletes inhibit their display of unpleasant feelings.

4.4. Gender differences

Lastly, gender differences are worth noting. In particular, men reported higher scores on both emotion regulation strategies, confidence, and functional anxiety, and lower scores on unpleasant anxiety than women. Moreover, women involved in individual sports scored higher on unpleasant anxiety. These differences are likely due to gender distinctions created by stereotypes and norms embedded in the social and sport systems. These social influences can impact how emotions and related feelings are expressed and, consequently, the use of emotion regulation strategies (Morano et al., 2020b; for a review, see Gill, 2020).

4.5. Practical implications

From an applied standpoint, coaches should provide athletes with a supportive environment to enhance their sense of competence, autonomy, and relatedness (Greenlees, 2022), and promote the experience of pleasant emotions and functional feeling states. Schüler et al. (2023) offered several suggestions on how to promote satisfaction of basic psychological needs in sport. Coaches can foster autonomy by providing athletes with opportunities to make decisions about their sport participation in training and competition, allowing them to express their opinions and preferences, and assisting them in making decisions that are consistent with their goals and values. Competence can be improved by providing informative feedback focused on improvements, setting realistic and achievable goals, and designing practice and competition environments that match the individual's skill levels and abilities. The sense of relatedness can be strengthened by providing opportunities for social interaction and promoting a supportive and inclusive environment in which all athletes feel valued and included.

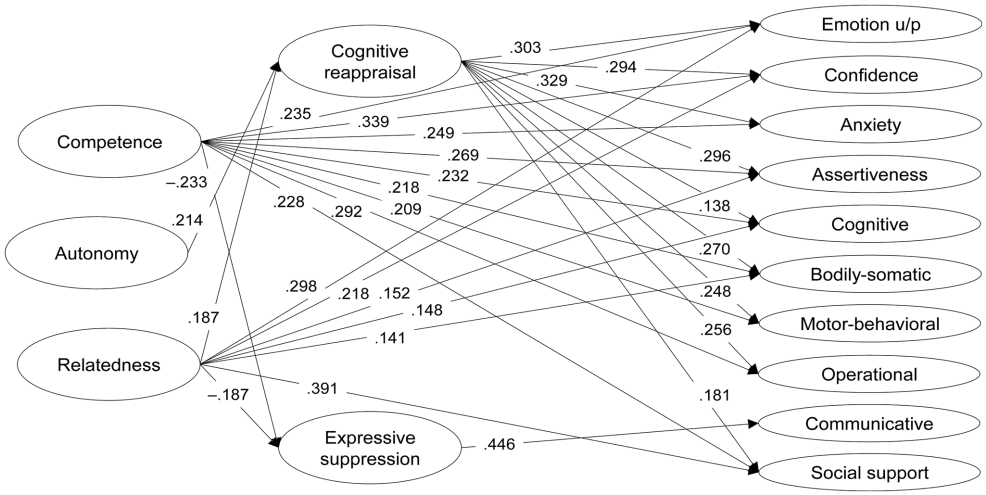

FIGURE 2
Structural equation model illustrating the relationships between basic needs (competence, autonomy, and relatedness), emotion regulation strategies (cognitive reappraisal and expressive suppression), and modalities of psychobiosocial experiences, controlling for gender, sport type, and gender by sport type interaction (covariates not shown for the sake of clarity). Only significant standardized estimates are presented ($p < 0.05$).

Furthermore, practitioners should help athletes adopt an adaptive emotion regulation style, focused on cognitive reappraisal rather than engaging in expressive suppression, to improve their sporting experience and well-being. Athletes should be informed about the differences between adaptive and maladaptive emotion regulation strategies, and the advantages of cognitive reappraisal over expressive suppression in terms of emotional responses and performance outcomes (Uphill et al., 2009). Practitioners should promote open communication in which athletes feel comfortable expressing their feelings and are willing to identify, reframe, and cognitively reappraise dysfunctional thoughts and emotions in training and competition (Lane et al., 2012). Examples of athletes' dysfunctional appraisal are, "I am feeling nervous about this event. I am afraid of embarrassing myself in front of everyone," and "I have already failed my goal under pressure. I did it at a decisive moment in the competition." Suggested adaptive alternatives can be, "Feeling nervous is normal before an event. I can use this energy to focus on my goals and give my best," and "Yes, I feel the pressure, but I have learned from my previous mistakes. I have worked hard and have the skills to deal with it. I just need to stay focused and trust my abilities."

4.6. Limitations and future directions

The cross-sectional nature of this investigation does not allow to establish causal relationships between variables, which also limits the generalizability of the findings. To determine causality, longitudinal or experimental studies are needed to assess the effect of one variable on other variables over time or as a result of an intervention.

Another study limitation is its focus on basic psychological needs and cognitive reappraisal, which represent narrowed aspects of athletes' motivation and emotion regulation within the broader frameworks of the self-determination theory (Ryan and Vansteenkiste, 2023) and the process model of emotion regulation (Gross, 1998, 2014, 2015). While basic psychological needs and cognitive reappraisals are important, they do not cover all factors that motivate and regulate goal-directed behavior. Therefore, a wider approach should consider, for example, individual differences, the dynamics of intrinsic and extrinsic motivations, the roles of expectancies and goals, and the environmental and social factors that influence motivation (Ryan, 2019), as well as a range of emotion regulation strategies used by different individuals (English et al., 2021). This approach could provide a more comprehensive understanding of the interplay between athletes' motivational factors, emotion regulation, and emotional responses on performance processes and outcomes.

Finally, we examined gender and sport type differences in the studied variable scores. Possible differences by age, experience, and competitive level could not be examined due to the unequal distribution of these categories in the sample. Future studies should involve a more balanced number of participants in terms of age, experience, competitive level, gender, and sport type, as well as establish measurement and structural invariance of the measures.

5. Conclusion

Findings suggest a positive relationship between athletes' basic psychological needs satisfaction and the use of cognitive reappraisal (i.e., an adaptive emotion regulation strategy), which involves changing the way a situation is evaluated in the sport context to regulate one's emotions. This, in turn, can lead athletes to experience pleasant emotions and a range of functional psychobiosocial experiences. The results are consistent with the tenets of basic psychological needs theory, within the broader perspective of self-determination theory, which proposes that satisfaction of psychological needs for autonomy, competence, and relatedness is essential for optimal motivation, engagement, and well-being. Overall, these findings suggest that promoting the satisfaction of basic psychological needs in athletes may have important implications for their emotion regulation. Coaches and practitioners can use this

information to design interventions that promote basic psychological needs satisfaction and encourage the use of adaptive emotion regulation strategies. Further research is needed to determine the final impact of basic psychological needs, emotion regulation styles, and emotion-related experiences on athletes' performance and well-being.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by "G. d'Annunzio" University of Chieti-Pescara. Written informed consent to participate in this study was provided by the participants or their legal guardian/next of kin.

Author contributions

CR and LB collected the data. CR performed the statistical analysis. All authors conceived the study, interpreted the results of the research, contributed to manuscript writing and revision, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1205102/full#supplementary-material

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 09 November 2023
DOI 10.3389/fpsyg.2023.1291443

OPEN ACCESS

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RECEIVED 09 September 2023
ACCEPTED 26 October 2023
PUBLISHED 09 November 2023

CITATION
Du Y (2023) Modeling the predictive role of music teachers' job commitment and optimism in their sense of self-efficacy.
Front. Psychol. 14:1291443.
doi: 10.3389/fpsyg.2023.1291443

Modeling the predictive role of music teachers' job commitment and optimism in their sense of self-efficacy

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Introduction: Teachers' psychological factors have been argued to influence various aspects of music education. However, scant research has explored the psycho-affective aspects of music teachers' work. To solve this shortage of research, this study examined the predictive role of Chinese music teachers' job commitment and academic optimism in their self-efficacy.

Methods: To this end, 340 music teachers from four universities in Henan Province completed an online survey including three questionnaires.

Results: The results of structural equation modeling (SEM) and regression analysis demonstrated that music teachers' self-efficacy could be positively and significantly predicted by their optimism and job commitment.

Discussion: The study provided implications for music education to pay further attention to the psychology of teaching in this field. Finally, directions for further research are presented to scholars, who are interested in the psycho-emotional side of music education.

KEYWORDS

music education, teacher job commitment, academic optimism, teacher self-efficacy, SEM

1. Introduction

Music teaching is an important profession all around the world given its significance in social life (Kandemir, 2019). It requires many psychological constructs to succeed (Wang et al., 2022; Pan, 2023; Pan et al., 2023; Wang and Derakhshan, 2023). One such construct is teacher commitment, which has been considered as a pivotal issue in effective music education (Türk and Korkmaz, 2022). Teachers' commitment refers to their affective bond with their job (Shukla, 2014) that shapes their identity and energy (Bakker and Leiter, 2010). It influences teachers' job satisfaction, retention, and perceived responsibility and loyalty (Celep, 2000; Klassen and Chiu, 2011). The level of teachers' commitment directly affects their rate of attrition, resignation, dissatisfaction, and demotivation (Mulkeen et al., 2007). In arts education, like other disciplines, teacher commitment holds significance and meaning in that it leads to a positive learning atmosphere, student growth, and academic success (Halim and Marzidi, 2023). Research shows that different demographic and psycho-affective factors influence teachers' perceived commitment (Moses et al., 2016).

A construct that may correlate with teachers' commitment is academic optimism (Kurz, 2006). Optimism is a concept that flourished with the advent of positive psychology (PP). It

refers to one's perceived hope, obligation, and positive attitude toward his/her life and job (Seligman, 2006). Optimism is critical to academic performance and success because optimistic teachers typically focus on strengths rather than weaknesses, pay attention to the bright side, and try to find solutions rather than succumb to the challenges (Pathak and Lata, 2018). Teachers' optimism creates positive beliefs and learning environments for teachers and students (Hoy et al., 2006). Empirical studies support the contribution of teacher optimism to many other positive factors such as resilience, well-being, rapport, classroom engagement, self-confidence, and job commitment (Hoy and Tarter, 2011; Lu, 2021; Dong and Xu, 2022; Wang et al., 2022; Pan et al., 2023). However, the predictive role of teachers' optimism and commitment in their sense of self-efficacy has rarely been empirically explored in arts education. Most of the existing studies are limited to general education, psychology, and second/foreign language education. As arts education is essential to students' growth, teachers should be skilled and certain of their abilities to provide meaningful arts instructions (Lummis et al., 2014).

To make this happen, teachers' self-efficacy should be enhanced in arts education as this construct determines their future actions (De Vries, 2013; Derakhshan and Fathi, 2023). The concept of self-efficacy refers to one's 'perceived operative capability', which he/she gains a desired level of success. Likewise, teachers' self-efficacy concerns their beliefs in their capability to influence students' learning (Garvis and Pendergast, 2010). Some studies in arts education research argued that teachers' self-efficacy beliefs shape classroom engagement, digital technologies incorporation, and attitudes toward teaching (Garvis, 2009; De Vries, 2013; Lummis et al., 2014; Saudelli and Ciampa, 2016). However, there is a dearth of research on the interplay of teacher commitment, optimism, and self-efficacy in this line of thinking. Without being a committed teacher, who is optimistic and hopeful of his/her career, it is difficult to be perceived as an efficacious arts teacher. To shed some light on this interaction, the present study aimed to unravel the predictive power of Chinese music teachers' commitment and optimism in their self-efficacy. In the literature, there is a lack of predictive research on teacher emotions in music education. By focusing on such a gap, the present study may expand the PP landscape from educational psychology to music education.

2. Literature review

2.1. Teachers' job commitment

The concept of teacher commitment concerns an instructor's perceived dedication, enthusiasm, and motivation toward his/her job and students (Halim and Marzidi, 2023; Zhi et al., 2023; Zhi and Wang, 2023). It is a type of psychological attachment to a significant object that bears meaning and importance to a person (Somech and Bogler, 2002). Committed teachers have a strong rapport with pupils, schools, and the teaching profession (Cohen, 2000). They also invest more time and energy in creating attractive classes for students to artistically grow (Lee et al., 2022). Commitment is a multi-dimensional factor involving three components affective, continuance, and normative commitment (Meyer et al., 1993). The first dimension concerns the emotional connection and attachment that a person develops in relation to a profession (Figure 1). Continuance commitment refers to a person's financial analysis and the cost he/she should pay to leave a job. Hence, he/she remains in the position owing to such challenges and possible penalties.

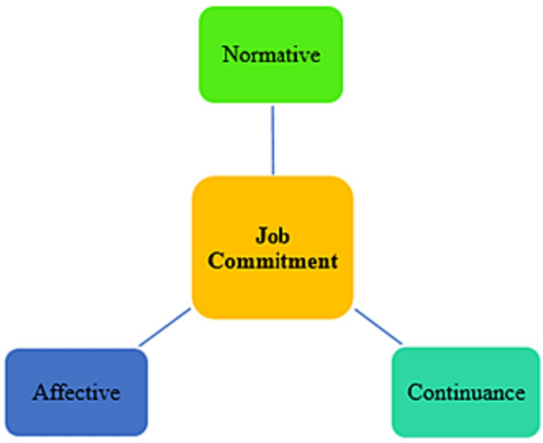

FIGURE 1
The dimensions of job commitment.

As the third dimension, normative commitment pertains to one's moral obligation, allegiance, and faithfulness to a job that prevents him/her from leaving the work. Teacher commitment is crucial for an effective instruction because, without affection for their job, teachers cannot direct education effectively (Crosswell and Elliott, 2004). Teacher commitment is influenced by several individual, contextual, internal, and external factors in academia (Pan, 2023). This is in line with social exchange theory (SET), which argues that teacher commitment is affected by an array of intrinsic and extrinsic factors related to workplaces (Miao et al., 2014). According to SET, individuals' commitment level is the outcome of their perceived sense of support and community at work. Other than demographic and background factors, teachers' commitment has been claimed to be affected by internal and psycho-emotional factors (Al-Jabari and Ghazzawi, 2019). Two intrinsic variables that may correlate with music teachers' sense of job commitment are optimism and self-efficacy, as explained in the subsequent sections.

2.2. Academic optimism

As a concept derived from PP, optimism refers to a person's expectation and mood of a future event regarding it as desirable and favorable (Carver and Scheier, 2002). It deals with an inspirational, affective, and psychological position that a person has toward the future occurring (Lu, 2021). Optimistic individuals look on the bright side even when there are difficulties. In teaching, optimism concerns teachers' intrinsic inclination to have faith in their skills to bring about learning and experience good events rather than troubles and failures (Hoy et al., 2008). As shown in Figure 2, teacher academic optimism has three dimensions of academic emphasis, collective efficacy, and faculty trust, which highlight teachers' strengths and engender positive outcomes in education (Hoy et al., 2006). As the first dimension of optimism, academic emphasis points to teachers' behaviors and beliefs in providing an optimistic learning atmosphere to foster learning and academic success (Hoy and Miskel, 2013).

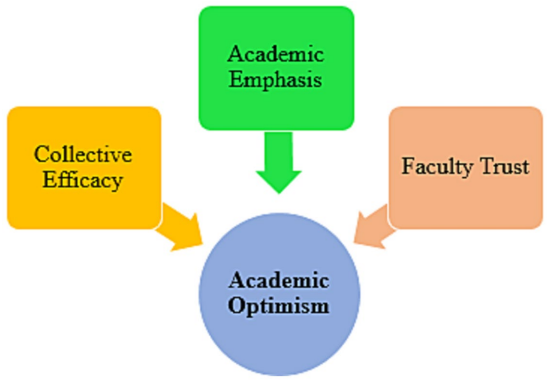

FIGURE 2
The dimensions of teacher academic optimism.

Moreover, collective efficacy concerns teachers' confidence in their skills to run instruction efficiently and produce achievement in learners. As the third dimension, faculty trust pertains to teachers' faith in students and parents to be given a role to play in the learning process (Hoy et al., 2006). The construct of optimism is also theoretically founded by Seligman's (2006) theory of academic optimism and Bandura's (1986) social cognitive theory (SCT). The former theory underscores the role of positive outlooks of the future in producing and maintaining positive outcomes, while the latter posits the dynamic impact of individual experiences, the actions of others, and environmental factors on one's learning. These theories underlie this study because academic optimism is an intrinsic, individual factor that is shaped by the mutual interaction of self, others, and social context. It is dynamic and affected by several factors two of which include commitment and self-efficacy. These two factors are supported by the individual basis of academic optimism posited in PP, optimism theory, and SCT.

2.3. Self-efficacy

The construct of self-efficacy dates back to the theory of self-regulation, which argues that a person's beliefs in his/her abilities produce actions that lead to outcomes expected (Bandura, 2001). The aim of self-efficacy is to change one's beliefs in abilities instead of actual abilities (Bandura, 1997; Han and Wang, 2021). Simply defined, self-efficacy is a perceived operative competence that a person holds of self in a job (Bandura, 1997). In the context of teaching, self-efficacy refers to teachers' faith in their own abilities to successfully teach students and make them learn the subject (Garvis and Pendergast, 2010). Self-efficacy is critical to education in that self-efficacy beliefs shape one's future actions and task performance (Skaalvik and Skaalvik, 2007). According to Bandura (1997), teacher self-efficacy is affected by four elements of *mastery experiences* (experiences shaped in teachers due to students' improved learning and outcomes), *vicarious experiences* (experiences obtained by watching others implementing a task successfully), *verbal persuasion* (feedback that a teacher receives about his/her instruction from others), and *physiological arousal* (teachers' psycho-affective responses to teaching events).

Teacher self-efficacy draws on SCT and pertains to a personal analysis of the teaching task in light of one's capacities (Tschannen-Moran et al., 1998). As put by Bandura (1997), individuals with perceived capability to accomplish certain tasks make more attempts to successfully do the tasks. He regards self-efficacy as a regulatory mechanism that shapes various cognitive, motivational, affective, and selection processes in teachers that are pivotal for learning. It is contended that teachers with greater self-efficacy are more confident in their abilities to help all students learn (Bandura, 1997). Teacher self-efficacy is context-specific and affected by different factors as posited by Bandura's (1997) triadic reciprocal causation model. The model argues that personal factors, behaviors, and environmental factors interact in the class to determine human agency and practice. Teachers' optimism and commitment are two personal factors that may play a role in this triadic model, which has received scant attention in arts education research.

2.4. Previous studies

The psychological foundations and implications of arts education have been cogently stressed in the literature (Grum and Grum, 2016; Mannopovna, 2019). Inspired by such a perspective, different studies focused on the conceptualization and measurement of psycho-affective variables in this field (Jin and Ye, 2022). Teacher commitment is among the variables, which has been considered significant in teachers' organizational practices (Imran et al., 2017). Previous studies show that teacher commitment correlates with teachers' sustainable motivation, turnover intentions (Payne and Huffman, 2005), professionalism (Shukla, 2014), and job satisfaction (Thawda and Simon, 2022). Moreover, Halim and Marzidi (2023) conducted a quantitative study in Malaysia with 190 arts teachers and found their commitment strongly correlated with their psychological factors and creativity. Teachers' commitment has also been found the fuel behind teachers' practices and attitudes toward their work (Türk and Korkmaz, 2022). In another recent study, Pan (2023) examined the mediating impact of teacher preparedness and professional learning on Taiwanese teachers' commitment. In the end, she reported a positive correlation among the variables. Another construct that may interact with teachers' commitment is optimism (Çoban and Demirtaş, 2011). In this regard, Kurz (2006) drew on PP and SCT and explored the relationship between teachers' optimism and commitment in Ohio. The results showed that teachers' optimism and positive beliefs were significantly related to their job commitment. Furthermore, Siddique et al. (2023) carried out a correlational study in Pakistan on 61,762 teachers and found a positive and significant relationship between teacher academic optimism and commitment. The factorial structure of academic optimism has also been the center of some studies (Hoy et al., 2008; Hoy and Miskel, 2013; Dai and Wang, 2023).

Another line of research on teacher optimism has focused on its effects on teachers' perceived resilience, well-being, rapport, classroom engagement, self-confidence, and job commitment (Hoy and Tarter, 2011; Lu, 2021; Dong and Xu, 2022; Hu and Wang, 2023; Wang et al., 2023). However, the joint influence of teacher commitment and optimism on arts teachers' work-related variables has remained under-researched. A possible construct, which can be predicted by the interplay of teacher commitment and optimism is self-efficacy. Teacher self-efficacy of arts teachers has been claimed to lead to positive engagement in the classroom (Lummis et al., 2014). In

another study conducted in Australia, de Vries (2013) found generalist teachers' self-efficacy beliefs significant in shaping their pedagogical practices and beliefs about teaching arts and music. The mediating role of technology and digital literacy in arts teachers' self-efficacy has also been proved by Saudelli and Ciampa (2016), who ran an ethnographic study on the impact of technological pedagogical content knowledge (TPACK) on teachers' self-efficacy in Canada. Additionally, Garvis (2009) tested the contribution of self-efficacy training on arts teachers in Queensland and argued that teachers attended the course could regulate their behaviors and beliefs about teaching more positively. As the review of the existing literature revealed, despite the fact that self-efficacy is an important determinant of both commitment and optimism (Hoy et al., 2006; Skaalvik and Skaalvik, 2007), few empirical studies have been conducted on the interplay between teacher commitment, optimism, and self-efficacy. Furthermore, the earlier studies on job commitment, optimism, and self-efficacy have separately focused on the conceptualizations, measurements, and correlations of these variables with other factors. However, their interaction has been somewhat neglected in the context of art education, so further empirical research on this topic is needed.

2.5. Research question and hypothesis

To bridge the gaps in arts education research, this quantitative study seeks to see whether teachers' commitment and optimism could predict their self-efficacy beliefs. In line with this purpose, the following research question and hypothesis will be addressed:

RQ: How much variance in music teachers' sense of self-efficacy can be predicted by their job commitment and optimism?

> H_0: Job commitment and optimism can not significantly predict teachers' self-efficacy.

3. Methods

3.1. Participants

In this study, a sample of 340 Chinese music teachers participated. They were practicing teachers from both genders (males = 48, females = 292). The age of the respondents varied from 20 to 60 years old ($M = 28$). They were graduates of musicology (i.e., the study of all aspects of music across cultures and periods), pedagogy (teaching music), and primary education (the practice of music education at primary levels across disciplines). The participants were teaching different aspects of music including traditional folklore in China, Western music, and popular instruments (e.g., guzheng, dizi, erhu, and pipa). Musicology majors accounted for the largest proportion of participants in the questionnaire, accounting for 60%. Regarding their education, the participants had certificate (20.6%), high school diploma (27.6%), bachelor's (26.2%), master's (11.5%), and doctorate (14.1%). The teaching experience level of the teachers varied, too. Particularly, 246 had 1 year of teaching, 21 had 2 years of teaching, 13 had 3 years of teaching, 15 had 4 years of teaching, 11 had 5 years of teaching, and 34 had more than 5 years of teaching. The respondents attended the study based on convenience sampling and their freedom and confidentiality were ensured at the outset of the research.

3.2. Instruments

3.2.1. Teacher commitment questionnaire

Allen and Meyer's (1990) proposed questionnaire was used to measure this construct. It encompassed 18 items divided into three sub-components of affective commitment (6 items), continuance commitment (6 items), and normative commitment (6 items). The scale followed a 5-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree." As an example, "I would feel guilty if I left this university now" represents the first component of the employed scale. Concerning reliability, the results of Cronbach's alpha indicated indices of 0.73, 0.81, and 0.79, respectively. In addition, McDonald's omega reported indices of 0.71, 0.83, and 0.78, respectively.

3.2.2. Teacher academic optimism questionnaire

To evaluate this variable, this study used Tschannen-Moran and Woolfolk Hoy's (2001) questionnaire. It comprised 42 items, the answers to which can vary from 1 "Strongly disagree" to 5 "Strongly agree." The questionnaire consists of three components, namely teachers' sense of efficacy, teachers' trust in parents and students, and individual academic emphasis. The reliability of the questionnaire components was calculated. The results indicated that the reliability index of each component for this inquiry was 0.79, 0.78, and 0.83, respectively. "I trust the parents' of my students" is a sample question from the scale. In addition, McDonald's omega reported indices of 0.78, 0.76, and 0.80, respectively.

3.2.3. Teacher self-efficacy questionnaire

Concerning this variable, the researcher used Tschannen-Moran and Woolfolk Hoy's (2001) self-efficacy questionnaire. It involved 24 items, each assessed on a 5-point Likert-type scale (1 = nothing, 5 = a great deal). The questionnaire comprises three different dimensions, including student engagement, classroom management, and instructional strategies. The overall reliability of this scale was 0.99 and the reliability of its sub-components was 0.77, 0.78, and 0.84, respectively. "How much can you do to get through to the most difficult students?" is an example from the scale. In addition, McDonald's omega reported indices of 0.79, 0.75, and 0.82, respectively.

3.3. Data collection procedure

The study was conducted in the form of a booklet questionnaire including three separate scales related to each variable. After explaining the goal of the study and how the questionnaires ought to be responded, the researcher distributed an electronic version of the questionnaires among 340 Chinese music teachers. They had different demographic and educational backgrounds. The data collection was conducted in both English and Chinese lasting 2 months and completed in early March 2023. The data were collected from four universities in Henan Province, located in Xinxiang, Zhengzhou, and

Xinyang. They were mostly teaching music in these universities, yet sporadically claimed to work in elementary and secondary schools, too.

It is essential to guarantee that the research was carried out with minimum risk to all parties engaged. Referring to autonomy, each participant was aware of the right to a free choice regarding participation or refusal to participate in the research, as well as withdrawal from the research at any time. The researcher also asked the participants to formally give their consent to participate. Additionally, the identity of all the participants was protected, and their right to privacy was guaranteed at all times. This also embraced their contact details, which were revealed to a third party without their consent. Finally, the collected data were protected and used exclusively for what they were gathered. Similarly, the principle of confidentiality was maintained at all stages of data collection and analysis. Additionally, the researcher assured the participants that their responses and data would be destroyed in an ethical manner after the completion of the research project. When the data were collected in the form of an Excel file, the researcher re-examined the responses for their accuracy and relevance. Then they were finalized for the subsequent statistical analyses using SPSS and Amos software.

3.4. Data analysis

The researcher used different statistical techniques to analyze the collected data. In doing that, the latest versions of SPSS and Amos software were utilized. To validate the scales, the original versions of the scales subjected to a confirmatory factor analysis (CFA). The scales were revised based on the results of CFA. The final versions of the scales were subjected to Cronbach's alpha and McDonald's omega to estimate the reliability of the instruments. Next, to answer the research question, the researcher used Linear Regression and SEM analysis to depict and test associational models of the three variables. Finally, appropriate statistical tables and figures were used to illustrate the final results.

4. Results

To validate the employed scales in this study, CFA was performed through IBM SPSS Amos (Version 26). Based on previous studies and the review of existing literature, a three-factor model was proposed separately for each variable. To acknowledge the convergent validity of their relationship, CFA was run again. The initial model showed a good fit to the data (see Figure 3). Goodness-of-fit indices can be seen in Table 1.

In Table 1, the result indicated that five determiners are ratio of CMIN-DF, goodness-of-fit index (GFI), comparative fit index (CFI), Parsimonious Normed Fit Index (PNFI), Tucker–Lewis Index (TLI), and root mean square error of approximation (RMSEA). The model fit indices are all within specifications. Therefore, CMIN/DF is 3.010 (spec. $\leq$3.0), GFI = 0.935 (spec. >0.9), CFI = 0.935 (spec. >0.9), PNFI = 0.770 (spec. >0.5), TLI = 0.930 (spec. >0.9), and RMSEA = 0.074 (spec. <0.080).

The results of Table 2 show that composite reliabilities of the factors are acceptable (CR > 0.70). In other words, the model has achieved composite reliability. The values also demonstrate that the convergent validity of the factors reach to an acceptable value (AVE > 0.50) or the model has achieved convergent validity. Another requirement of convergent validity is factor loading more than 0.50. The results of factor loading are presented in Table 3. In addition, the results indicate that the model has achieved discriminant validity (the square root of AVE > inter-construct correlations).

The results of Table 3 show that almost all of the values are more than 0.50. It means that the model has achieved the convergent validity.

To answer the research question, Linear Regression was run in SEM. The estimation of such models has relied on covariance analysis methods, usually with the maximum likelihood (ML) estimator. The results of this analysis are presented in Table 4 and Figure 4.

The results of Table 4 represent that music teachers' self-efficacy can be strongly and favorably predicted by their job commitment ($\beta = 0.64$, $p < 0.05$) and optimism ($\beta = 0.77$, $p < 0.05$).

5. Discussion

This quantitative study examined the predictive role of Chinese music teachers' commitment and optimism in their sense of self-efficacy. Using SEM and Regression analysis, the researchers found that job commitment could predict about 64% of changes in the teachers' self-efficacy. This result concurs with Bandura's (1997) SCT which regards self-efficacy as an outcome of numerous personal and environmental factors. Teachers' job commitment is a sample personal factor that is affected by environmental factors and this interplay, in turn, determines music teachers' self-efficacy beliefs. Additionally, this interaction is in line with the affective and normative dimensions of commitment, which highlight the emotional connection and obligation of a person to his/her profession. This form of attachment influences one's behaviors, feelings, and practices, as well. The results are also empirically supported by de Vries (2013), who ran narrative research in music education and found that teachers' self-efficacy beliefs are realized through their professional commitment. This correlation can be explained by the affective nature of both constructs in that a teachers' emotional attachment to his/her job fosters strategic investment, enthusiasm, resilience, and dedication that play a critical role in self-efficacy beliefs. When a teacher is strongly committed to teaching, he/she constantly tries to increase his/her pedagogical abilities and certainty in implementing different methodologies. It seems that the participants had enough knowledge of PP and the interaction among various work-related and teacher-related factors. This might be due to Chinese teachers' pre-service and in-service training, where the psychology of music education had been taught by experts. Another justification for this result can be the participants' consideration of job commitment and attachment as a precondition for personal factors (i.e., self-efficacy). They had concerns about the job before their certainty in self-abilities. This can be attributed to their macro-view in music education.

Moreover, the results of this study indicated that optimism predicted about 77% of changes in the teachers' self-efficacy. This statistical bond agrees with Hoy et al.'s (2006) conceptualization of academic optimism, which regards the sense of efficacy as a dimension of optimism. Likewise, this result is consistent with Seligman's (2006) academic optimism theory, which underscored the contribution of optimism to the generation of several other outcomes in individuals (e.g., self-efficacy). Furthermore, the result

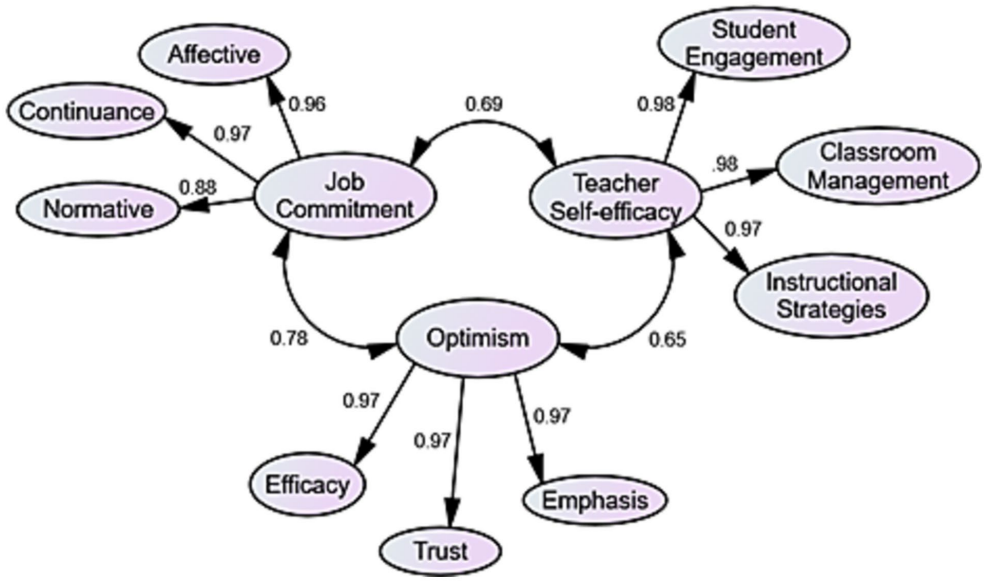

FIGURE 3
The final modified CFA model with standardized estimates.

TABLE 1 Evaluation of the CFA goodness of fit.

		Threshold			
Criteria		Terrible	Acceptable	Excellent	Evaluation
CMIN	9957.087				
DF	3,308				
CMIN/DF	3.010	>5	>3	>1	Acceptable
RMSEA	0.074	>0.08	<0.08	<0.06	Acceptable
GFI	0.935	<0.9	>0.9	>0.95	Acceptable
CFI	0.935	<0.9	>0.9	>0.95	Acceptable
PNFI	0.770	<0.5	>0.5		Acceptable
TLI	0.930	>0.9	>0.9	>0.95	Acceptable

TABLE 2 Composite reliability and discriminant validity of the factors.

	CR	AVE	MSV	MaxR(H)	Optimism	Teacher self-efficacy	Job commitment
Optimism	0.990	0.972	0.121	0.994	**0.986**		
Teacher self-efficacy	0.994	0.981	0.477	1.006	0.348	**0.990**	
Job commitment	0.956	0.878	0.477	0.969	0.278	0.691	**0.937**

Bold values are significance of the variable.

augments SCT in that it adds a further approval to the idea that self-efficacy is affected by internal, individual variables, too. According to Bandura (1997), self-efficacy may emerge by a person's physiological arousal in a job. Hence, it can be interpreted that optimism as an instance of such psycho-affective responses to teaching interacts with and stimulates music teachers' self-efficacy. The result can be explained by Chinese teachers' positive mentality and positive future outlook for music education that could foster their assurance in their abilities to teach music. This positivity might be developed in teachers during university education or other professional development programs. Another reason for this result could be the educational culture of China, which places emphasis on the psychology of teaching and learning. Correspondingly, teaching fine music, which is basically connected to one's emotions and imagination, is best implemented in an emotion-based education. It also appears that the participants had a high emotional literacy regarding music education and its common psycho-emotional factors. That is why, they believed in the interplay of commitment, optimism, and self-efficacy. What is left unnoticed in this study is the possible intervention of demographics and educational profiles

TABLE 3 Factor loading of the initial CFA model.

			Estimate	S.E.	C.R.	*p*
Teacher self-efficacy	<-->	Job commitment	0.694	0.072	9.423	0.000
Optimism	<-->	Teacher self-efficacy	0.651	0.065	5.740	0.000
Optimism	<-->	Job commitment	0.782	0.060	4.597	0.000
Affective	<---	Job commitment	1.008	0.054	18.628	0.000
Continuance	<---	Job commitment	1.072	0.051	21.033	0.000
Normative	<---	Job commitment	1.000			
Student Engagement	<---	Teacher self-efficacy	0.956	0.027	35.178	0.000
Classroom Management	<---	Teacher self-efficacy	1.001	0.021	47.040	0.000
Instructional Strategies	<---	Teacher self-efficacy	1.000			
Emphasis	<---	Optimism	1.000			
Trust	<---	Optimism	1.385	0.071	19.558	0.000
Efficacy	<---	Optimism	1.377	0.072	19.001	0.000
AF1	<---	Affective	1.000			
AF2	<---	Affective	1.011	0.044	23.093	0.000
AF3	<---	Affective	1.062	0.044	24.005	0.000
AF4	<---	Affective	1.062	0.039	27.374	0.000
AF5	<---	Affective	1.057	0.040	26.690	0.000
AF6	<---	Affective	0.822	0.065	12.606	0.000
CO6	<---	Continuance	1.000			
CO5	<---	Continuance	0.999	0.025	40.563	0.000
CO4	<---	Continuance	1.016	0.028	36.568	0.000
CO3	<---	Continuance	1.063	0.026	41.656	0.000
CO2	<---	Continuance	0.863	0.045	19.111	0.000
CO1	<---	Continuance	0.963	0.029	32.956	0.000
NO6	<---	Normative	1.000			
NO5	<---	Normative	0.883	0.040	22.194	0.000
NO4	<---	Normative	0.983	0.035	27.762	0.000
NO3	<---	Normative	0.967	0.036	26.554	0.000
NO2	<---	Normative	0.977	0.041	24.041	0.000
NO1	<---	Normative	0.920	0.036	25.429	0.000
SE1	<---	Student engagement	1.000			
SE2	<---	Student engagement	1.002	0.028	36.397	0.000
SE3	<---	Student engagement	1.014	0.027	38.240	0.000
SE4	<---	Student engagement	0.999	0.026	39.132	0.000
SE5	<---	Student engagement	0.994	0.026	38.812	0.000
SE6	<---	Student engagement	1.003	0.025	40.314	0.000
CM1	<---	Classroom management	1.000			
CM2	<---	Classroom management	0.993	0.022	46.084	0.000
CM3	<---	Classroom management	0.992	0.021	47.352	0.000
CM4	<---	Classroom management	1.017	0.020	50.756	0.000
CM5	<---	Classroom management	0.995	0.020	50.200	0.000
CM6	<---	Classroom management	0.981	0.021	47.844	0.000
SE7	<---	Student engagement	1.002	0.024	42.537	0.000
SE8	<---	Student engagement	1.017	0.024	43.001	0.000
CM7	<---	Classroom management	0.993	0.021	46.576	0.000
CM8	<---	Classroom management	0.978	0.022	44.427	0.000
IS1	<---	Instructional strategies	1.000			
IS2	<---	Instructional strategies	1.018	0.023	43.805	0.000
IS3	<---	Instructional strategies	0.990	0.023	43.170	0.000
IS4	<---	Instructional strategies	0.941	0.033	28.601	0.000
IS5	<---	Instructional strategies	0.996	0.022	45.427	0.000
IS6	<---	Instructional strategies	0.988	0.024	41.799	0.000
IS7	<---	Instructional strategies	1.005	0.022	46.311	0.000
EF6	<---	Efficacy	1.000			
EF5	<---	Efficacy	1.007	0.019	53.439	0.000
EF4	<---	Efficacy	1.036	0.019	53.802	0.000
EF3	<---	Efficacy	0.990	0.019	51.499	0.000
EF2	<---	Efficacy	1.011	0.019	53.641	0.000
EF1	<---	Efficacy	1.038	0.020	52.772	0.000
EF7	<---	Efficacy	0.990	0.018	54.645	0.000
EF8	<---	Efficacy	1.032	0.017	59.758	0.000
EF9	<---	Efficacy	0.962	0.021	45.608	0.000
EF10	<---	Efficacy	1.006	0.018	54.472	0.000

TABLE 3 (Continued)

			Estimate	S.E.	C.R.	*p*
EF11	<---	Efficacy	0.905	0.024	38.235	0.000
EF12	<---	Efficacy	0.834	0.029	28.805	0.000
EF13	<---	Efficacy	0.973	0.022	44.155	0.000
EF14	<---	Efficacy	1.005	0.023	44.577	0.000
TR8	<---	Trust	1.000			
TR7	<---	Trust	0.936	0.021	45.366	0.000
TR6	<---	Trust	0.921	0.022	41.135	0.000
TR5	<---	Trust	1.010	0.019	54.353	0.000
TR4	<---	Trust	0.617	0.042	14.579	0.000
TR3	<---	Trust	0.994	0.024	42.145	0.000
TR2	<---	Trust	0.646	0.042	15.442	0.000
TR1	<---	Trust	0.742	0.035	21.051	0.000
TR9	<---	Trust	1.005	0.018	56.745	0.000
TR10	<---	Trust	0.952	0.021	44.841	0.000
TR11	<---	Trust	0.984	0.019	53.188	0.000
TR12	<---	Trust	0.806	0.030	27.288	0.000
TR13	<---	Trust	0.898	0.024	36.965	0.000
TR14	<---	Trust	0.568	0.045	12.609	0.000
EM8	<---	Emphasis	1.000			
EM7	<---	Emphasis	0.849	0.072	11.786	0.000
EM6	<---	Emphasis	1.057	0.067	15.862	0.000
EM5	<---	Emphasis	0.847	0.068	12.540	0.000
EM4	<---	Emphasis	0.977	0.068	14.474	0.000
EM3	<---	Emphasis	1.164	0.065	18.003	0.000
EM2	<---	Emphasis	1.017	0.066	15.438	0.000
EM1	<---	Emphasis	1.201	0.070	17.146	0.000
EM9	<---	Emphasis	1.366	0.068	19.950	0.000
EM10	<---	Emphasis	1.356	0.068	19.931	0.000
EM11	<---	Emphasis	1.146	0.067	17.158	0.000
EM12	<---	Emphasis	1.373	0.070	19.672	0.000
EM13	<---	Emphasis	1.348	0.069	19.572	0.000
EM14	<---	Emphasis	1.223	0.066	18.541	0.000

AF, affective commitment; CO, continuance commitment; NO, normative commitment; SE, student engagement; CM, classroom management; IS, instructional strategies; EF, sense of efficacy; TR, trust in parents and students; EM, individual academic emphasis.

of the participants in the proposed model of association. This can be tested in future studies.

6. Conclusion and implications

The present study investigated the predicting role of music teachers' job commitment and optimism in their self-efficacy. Based on the results, it can be concluded that like other disciplines, music education has a psycho-affective basis, which determines different areas of teachers' work. To become sure of one's skills to teach music, it is essential for teachers to be optimistic and committed to teaching, at first. When an instructor has a positive outlook of future and events in

TABLE 4 Results of linear regression analysis with SEM.

			Estimate	S.E.	C.R.	*p*
Teacher self-efficacy	<---	Job commitment	0.644	0.072	9.423	0.000
Optimism	--->	Teacher self-efficacy	0.771	0.065	5.740	0.000
Affective	<---	Job commitment	0.958	0.054	18.628	0.000
Continuance	<---	Job commitment	0.971	0.051	21.033	0.000
Normative	<---	Job commitment	0.879			
Student engagement	<---	Teacher self-efficacy	0.978	0.027	35.178	0.000
Classroom management	<---	Teacher self-efficacy	0.981	0.021	47.040	0.000
Instructional strategies	<---	Teacher self-efficacy	0.991			
Emphasis	<---	Optimism	0.988			
Trust	<---	Optimism	0.995	0.071	19.558	0.000
Efficacy	<---	Optimism	0.974	0.072	19.001	0.000

teaching music and is dedicated to it, he/she is more likely to experience self-efficacy compared to someone, who is dubious of the job and feels no attachment to it. In other words, music education is strongly connected to emotions and psycho-affective factors, which reciprocally interact to determine teachers' behaviors and practices. This conceptualization is supported by PP, which sees academicians' emotions tied to many other emotions. With these in mind, the current study is claimed to be advantageous to music teachers, trainers, and policy-makers. More particularly, the results can help music teachers understand the psycho-affective aspect of their profession and the interaction among three important factors involved in teaching music. They can use the results to develop a positive outlook of their profession and feel dedicated to what they are doing in a way that their inner states are positively triggered and enhanced. Moreover, music teacher trainers can utilize the results of this study and offer emotion-based training courses to music teachers, where practical techniques are taught to teachers to deal with emotions related to music education and pedagogy. They can elaborate on the principles and practices of PP in relation to music education in interactive courses with teachers. Similarly, policy-makers of music education can draw on the results can shift their decisions and plans from mere pedagogical concerns to psycho-affective considerations of teaching and learning fine music in China. They can envision and suggest practical plans to engage music teachers and learners through various motivators.

Despite these implications, this study has some limitations, especially its mere quantitative research design. Future research can be done using qualitative and mixed-methods designs in music education. Moreover, the data were collected from only a single context (i.e., China) and this requires care in interpreting and generalizing the results to other places. To compensate for this lack, further research is suggested to focus on cross-cultural studies on the interaction among commitment, optimism, and self-efficacy. Additionally, future researchers can compare and contrast different disciplines in light of the three constructs examined in this study. The differences between novice

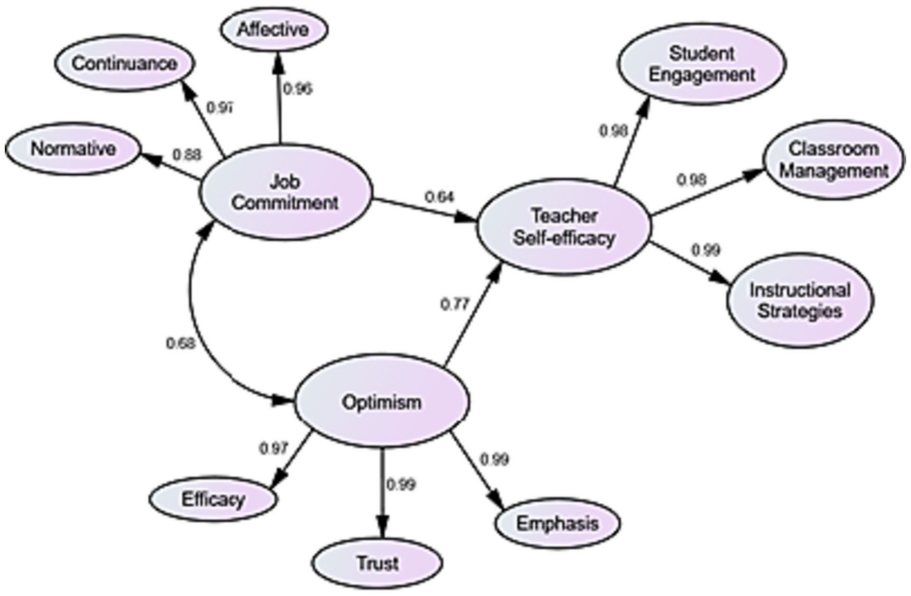

FIGURE 4
The final measurement model.

and experienced music teachers in light of the interplay of constructs is also recommended. Finally, the role of contextual and environmental factors in shaping teachers' professional commitment, academic optimism, and self-efficacy has rarely been explored (Derakhshan et al., 2023). Future research is demanded to fill this gap.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Academic and Ethics Committee of Xinxiang University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

YD: Writing – original draft, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This work is supported by Key research projects for Higher Education of Henan province "Research on the strategies of promoting the development of primary and secondary school science education by relying on higher education resources" (grant Number: 24B880047).

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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frontiers | Frontiers in Psychology

TYPE Review
PUBLISHED 23 November 2023
DOI 10.3389/fpsyg.2023.1293872

OPEN ACCESS

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RECEIVED 13 September 2023
ACCEPTED 18 October 2023
PUBLISHED 23 November 2023

CITATION
Gumm AJ (2023) Music motivation depends on what to motivate: research review of Gumm's music teaching and conducting models. *Front. Psychol.* 14:1293872. doi: 10.3389/fpsyg.2023.1293872

Music motivation depends on what to motivate: research review of Gumm's music teaching and conducting models

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The history and philosophy of music education are traced with varied efforts to hone, enhance, and shift a strong tradition of performance-based instruction. The purpose of this study is to summarize the research of Gumm's empirical models of eight music teaching and six conducting approaches and their application in the profession across three decades toward varied philosophical aims. Each approach coordinates a distinct set of instructional and motivational behaviors toward a particular learning effect or outcome. Different balances of approaches reveal broader aims, such as performance, comprehensive musicianship, cooperative, discovery, and affective learning, or even basic on-task behavior. Broader yet are two overarching aims found in common to both music teaching and conducting—to control or release. Controlling music teaching asserts correct on-task behavior through clear task directions and corrective feedback, motivates attention to task nonverbally, efficiently fills time with active tasks, and clarifies and affirms positive learning. In contrast, cooperative group leadership releases interdependent learning, questioning fosters music concept learning, imagery and movement release artistry, and discussing unique perspectives releases independent ideas and feelings. In conducting, precise gestures control accurate timing, signals and alerts motivate attention, and mimicry of musician exertions controls physical tone production; whereas shaping of phrases and score markings release musical expression, psychosocially familiarized gestures foster interdependence, and tension-easing gestures release freer independent tone production. Control-oriented teaching is most prevalent across the field, yet links to greater burnout and appeals to accommodating students motivated by effort and ability more than students motivated by social and affective enjoyment of music. In conducting, music-oriented precision and expression are more prevalent than musician-oriented approaches. Releasing approaches are more prevalent in Western than Eastern culture, upper levels, early rehearsals well before concerts, smaller ensembles, competitive ensembles, and teachers and conductors with greater experience or varied movement training. Conclusive implications are that the key to motivation is to draw attention to specific and intentional forms of learning, and that whatever is motivated to attention also motivates a particular philosophy of music education. Future research is suggested in general music and ethnic, folk, popular, community, and professional music ensembles.

KEYWORDS

music teaching, music conducting, music motivation, music performance, comprehensive musicianship, music education philosophy

1 Introduction

The history and philosophy of music education are traced with varied efforts to hone, enhance, and shift a strong tradition of performance-based instruction. Starting in the 1970s, music education research sought to sort out how to effectively keep behavior focused on directed performance tasks and meet comprehensive and alternative aims (Gumm, 1992). Most theories focused on a single set of dichotomous aims, such as unsupportive vs. supportive (c.f., direct vs. indirect, formal vs. informal, or teacher- vs. student-oriented), high vs. low magnitude or intensity, complete vs. incomplete sequential patterns (i.e., task directions, student response, reinforcing feedback), and most to the point, music performance vs. comprehensive musicianship. Also, starting in the 1970s, research on conducting sorted out music-related gestures as well as nonverbal kinesics of conducting that extended to everyday gestures relatable to sign language and mime (Gumm et al., 2011). Music conducting theories focused chiefly on dichotomies of expressive vs. mechanical or inexpressive gestures, high vs. low intensity as an overlapping concern, and gestures that induce vs. ease tension in physical technique.

In Gumm (1993) and Gumm et al. (2011), I initiated a more holistic multivariate approach that led to models that remain the most comprehensive in the field. The music teaching model, comprised of eight factors, is encapsulated in the *Music Teaching Style Inventory* (MTSI; Gumm, 2009). The conducting model comprises six factors, is encapsulated in the *Conducting Priorities Survey* (CPS; Gumm, 2016c), and is affirmed as having been developed through the "most systematic research on the functions that the conductor fulfills" (Jansson et al., 2022, p. 513).

The purpose of this study is to summarize research on the varied approaches of these models and their application in the profession across three decades toward varied philosophical aims. Compared to practical pedagogical summaries of the music teaching model (Gumm, 1994, 2003a, 2005a,b) and conducting model (Gumm, 2012, 2020), this is a review of all research studies found to have collected data on the two models—my own 13 survey and mixed-methods studies and nine additional researcher applications of surveys that also include mixed-methods comparisons with qualitative observation and interviews.

As empirical models, I did not invent them through personal experience, expert opinion, or subjective sorting. Rather, each approach is a statistical coalescence of prior research content based on the self-reported behaviors of thousands of practicing music teachers and conductors. As a measurement instrument, the MTSI has been tested for content and construct validity in elementary, lower secondary, upper secondary, and college/university general, choral, and instrumental music settings both across the U.S., (Gumm, 1993, 2004a,b, 2007; Gumm and Essmann-Paulsen, 2001; Basilicato, 2010; Groulx, 2010; Olesen, 2010; Bazan, 2011) and internationally (Tsai, 2000; Shah, 2005, 2007; Hsieh, 2010). Also verified in research is its predictive validity with festival and competition ratings (Gumm, 2003b; Groulx, 2010), discriminant validity with measures of learning style, motivation, teacher burnout, and personality (Gumm and Essmann-Paulsen, 2001; Gumm, 2004a; Basilicato, 2010; Groulx, 2010; Gumm and McLain, 2013), and convergent validity against college student evaluations of ensemble director effectiveness, objective video observations, and teacher/director and ensemble musician interviews (Gumm, 2004b, 2007, 2018; Bazan, 2011; Gumm et al., 2018). The CPS similarly has been validated through mixed-methods research and regional and national surveys of conductors of varied ensemble types, educational levels, and career experience, including discriminant validity and relations with MTSI scores (Gumm, 2016a,b, 2018; Gumm et al., 2018).

Certainly, though, in interpreting statistical results, I drew upon prevalent terminology and understandings that, at this point, warrant clarification. As a first clarification, I recognize the inconsistency of developing a model of music teaching style dimensions versus a model of conducting functions, each drawn from respective research trends at the time. For consistency, in this writing, I address both issues the same for both models, referring to dimensions as *factors* or *approaches* and their functions as *aims*, *intentions, focus*, or *motivations*. In discussing the unique aim underlying a particular balance of approaches, I substitute the words *priority*, *balance*, and *practice* in place of style. First, we look at the varied, effective approaches to music teaching and conducting.

2 Approaches

2.1 Patterns of behavior

I originally posed a definition of music teaching style as patterns of behavior (Gumm, 1993). To bring this up to date, music teaching and conducting approaches moreover are *coordinated* and *stable* patterns of behavior.

2.1.1 Coordinated patterns

The notion of coordinated behavior patterns is similar to the theory of sequential patterns or units of music instruction as complete or incomplete depending on whether each behavior is carried out (Yarbrough and Price, 1981, 1989). This notion is reflected in the research methods I selected to develop both the music teaching and conducting models.

By the factor analysis methods applied, music teachers and conductors participating in theory development had to have distinctively and consistently rated behaviors in coordination for them to coalesce into factors. In theoretical terms, each factor represents latent traits or constructs that are more considerable than defined by measurable behaviors. MTSI and CPS survey items are merely the most reliable and representative measures among a large set of related behaviors, and all coordinated around a distinct global construct.

By survey design, then, high scores result when each behavior or gesture in the pattern is used most frequently, with moderate scores resulting from incomplete or *uncoordinated* use and low scores resulting from low frequency or nonuse overall. Table 1 shows the most representative survey content for each approach.

2.1.2 Stable patterns

From the start, in both lines of research, I further sought to examine stable, pervasive, consistent patterns of music teaching and conducting behavior. As originally reviewed (Gumm, 1992) and then revisited in critique (Sprikut, 2015), researchers have long been divided into whether teaching style is quick-to-change on a whim or stably slow to change. In initial reviews of research (Gumm, 1992, 1993), I detected a certain preoccupation in music education research with shifting teaching behaviors and single-aim approaches to the neglect of stable overarching patterns and trends. I initiated a research line to fill this void.

TABLE 1 Music teaching and conducting factors and most definitive content.

Music teaching model			
Control	Assertive Teaching • Give clear task directions. • Monitor behavior closely. • Communicate an awareness of student behavior. • Remind to follow directions. • Verbally demand sharp attention to tasks. • Give corrective feedback to responses to directions.	Time Efficiency • Give directions as quickly as possible. • Require students to act quickly to directions. • Keep students busy and active. • Keep a brisk pace of activities. • Get as many things done in scheduled time as possible.	
	Positive Learning Environment • Support and care about student feelings. • Clarify information that students are uncertain about. • Take time to answer student questions. • Allow students to answer questions completely. • Praise students when they do a good job.	Nonverbal Motivation • Change intensity or pace of activity. • Change proximity/closeness to musicians. • Attention-getting eye contact, facial expressions, body stance, and hand gestures. • Show enthusiasm.	
Release	Group Dynamics • Have students rehearse/learn in small interactive groups. • Have students work with each other. • Have individuals present and perform for peers. • Have the group be led by student leaders. • Have students brainstorm among themselves.	Artistic Music Performance • Describe/compare musical events in physical, visual, aural/sound terms. • Refine internal music images. • Describe music in metaphors. • Use physical movement methods.	
	Music Concept Learning • Present concepts about music performed. • Ask to recall and recognize music terms/facts. • Ask to draw comparisons between examples. • Ask to diagnose problems in own performance. • Ask to solve a musical/music-making problem.	Student Independence • Use discussion and dialogue. • Develop unique ideas about music. • Encourage students to be creative. • Ask students to explore how they feel about music.	
Music conducting model			
	Music-oriented	Musician-oriented	
Control	Mechanical Precision • Gesture distinct meter patterns. • Provide clear downbeats. • Indicate clear beat points. • Give distinct cues and cutoffs. • Indicate precise tempos and tempo changes.	Motivational • Maintain eye contact. • Shift gaze to alert attention. • Circulate to closer proximity. • Signal reminders ahead of musical events.	Physical Technique • Model healthy technique and stance. • Gesture proper skills for musicians to copy. • Guide movement size, strength, & energy. • Mirror musicians' physical motions.
Release	Expressive • Depict expressive markings in the score. • Change dynamics in right or independent left hand. • Shape phrase contours and peaks. • Gesture the music's overall expressive character. • Reflect the emotional intent of the music.	Psychosocial • Use gestures made familiar to musicians. • Use gestures that vulnerably respond rather than control. • Mime familiar objects or actions portraying the music. • Choose gestures based on ensemble member ideas.	Unrestrained Tone • Use gestures that ease tension in musicians' performance. • Gesture for musicians to release an upward lifting tone. • Shape the flow of ensemble tone. • Minimize motion so musicians learn to follow each other's influences. • Stop conducting for musicians to develop their own internal tempo.

Methodological choices reflect an aim to measure stable factors. In both the MTSI and CPS, behaviors and gestures are rated on a scale of never to always to establish how persistently they are used across time. Items related to each approach are then summed—each set representing a distinct pattern of behaviors or gestures. Moreover, latent traits identified through factor analysis are defined as stable ways people behave that may change slowly with experience.

Finally, the ability of the MTSI and CPS to measure stable approaches was validated in research. Test–retest applications of the MTSI validated the stability of approaches after months of teaching (Gumm, 1993). Correlations between university conductors' CPS self-ratings, content analyses of conductor video-recall interview descriptions and my expert observation analysis of the same series of randomly selected rehearsal episodes (Gumm, 2018) relatively support that the CPS captures stable, consistent approaches. Similarly, Bazan

TABLE 2 Music teaching and conducting approaches, priorities, aims, and influences.

Model Focus†		Approach	Learning aim	Background influences	Method influences *
Music teaching	Control	Assertive Teaching	Correct to task	Lower levels, instrumental more than choral	kinesics (nonverbal communication)
		Time Efficiency	Productive	Higher degree	kinesics, mime, Kodaly
		Nonverbal Motivation	Attentively focused	Higher degree	kinesics, mime, Kodaly
		Positive Learning Environment	Clear and careful	Experience, females	kinesics
	Release	Group Dynamics	Interdependent	Experience, males, farther west (US)	kinesics, yoga, dance, Kodaly
		Music Concept Learning	Critical thinking	Higher levels, higher degree & experience	kinesics, yoga, Kodaly, Dalcroze
		Artistic Music Performance	Embodied expressively	N/A	kinesics, mime, dance, Tai Chi
		Student Independence	Created and felt deeply	N/A	kinesics, yoga, dance, Tai Chi
Music conducting	Control	Mechanical Precision	Timed correctly	Higher degree & years of experience	Mime, Feldenkrais, less Alexander, kinesics
		Motivational	Attentively focused	Higher degree and experience, lower levels	Mime, dance, acting, Feldenkrais, less Alexander
		Physical Technique	Produced strongly	Higher degree and experience	Mime, acting, Alexander
	Release	Expressive	Expressed musically	Higher degree and experience, farther west, males	Mime, dance, yoga
		Psychosocial	Familiarly grasped	Experience	Mime, dance, acting, Alexander
		Unrestrained Tone	Produced freely	Higher degree and experience, farther west	Kinesics, dance, acting, Dalcroze, Alexander

†Further informed by prior contrasts of direct vs. indirect, formal vs. informal, unsupportive vs. supportive, dependent vs. interdependent/independent, and teacher-oriented vs. student-centered (Gumm, 1992; Gumm and Essmann-Paulsen, 2001).
*The more types of methods training the more musician-oriented the teaching and conducting; no significant impact of Laban training on any teaching or conducting approaches has been detected in these studies (Gumm and Simon, 2011; Gumm, 2016a).

(2011) found how interview self-descriptions of music teaching approaches used across a concert season balanced out similarly to MTSI scores—answering a puzzle of not seeing a balance in limited rehearsal observations. Conclusively, the CPS and MTSI capture stability that is only externally observable across a representative sampling of rehearsals.

2.2 Underlying aims

Patterns of behavior not only coordinate into distinct approaches but are coordinated toward particular learning *aims*. The aim behind each behavior pattern I determined interpretively, informed by closest matching prior theories and approaches (Gumm, 1993; Gumm et al., 2011). Table 2 lists the learning aims interpreted by each music teaching and conducting approach.

2.2.1 Productive and correct to task

Time efficiency has the basic aim of keeping students productive or, more simply, covering more ground and getting more done. This aim is initiated by keeping instructional directions brief, direct-to-task, and focused on action, including managing multiple tasks to accomplish several things at a time. In short, it is about staying actively on task, with the amount of clock time kept on task as both the motivational incentive and criterion of success.

Assertive teaching is rooted in the earlier music education theory of sequential patterns of task presentation, student response, and feedback (Yarbrough and Price, 1981, 1989), which itself is rooted in behaviorist reinforcement theory. Assertive teaching expands and clarifies prior theory in four ways. Firstly, the pattern was refined to start with specific task directions, follow with close monitoring of response, and end motivationally with specific feedback about how students responded to directions. Secondly, the interpreted aim of the pattern is to respond *correctly* to task directions. Thirdly, motivation of correctness went beyond three sequential steps to include: communicating awareness of behavior, saying to follow directions, remind of the intended task, verbally demanding sharp attention to task, and offering consequences—though this last behavior remains in the MTSI as least definitive and reliable by its shift in focus to incorrectness. Fourthly, the added steps suggest more of an ongoing teaching cycle that sticks to the task until it is done right rather than a single sequential unit that stops at first completion.

Efficient timing and correctness are matched in conducting by mechanical precision. The conducting aim is to have the correct synchronous timing of music events. Musically, this includes beat, meter, rhythm, and the cuing of entrances at the start and cutoffs at the end of textural events. Being in time with the conductor also controls tempo, especially changes of tempo not as an expressive concern but as a matter of accuracy.

2.2.2 Caring and careful learning

A positive learning environment presents a second clarifying extension to the complete sequential pattern theory that involves an even greater cyclical exchange with students. In this case, the cycle begins by clarifying student understanding of task expectations and ends motivationally with positive feedback. This form of feedback, as explained from the onset (Gumm, 1992, 1993), is called contingent praise to ensure affirmation is only given after positive learning growth

is observed to occur to avoid motivationally reinforcing non-learning or negative behavior. Content from prior research on positive interpersonal relations, such as taking and answering student clarifying questions, swayed my original interpretation of its aim to foster a climate or environment for positive learning. However, the focus is on a positive-learning environment, not a positive learning-environment.

2.2.3 Focused attention

Nonverbal motivation expounds on Yarbrough's (1975) theory of magnitude or intensity of nonverbal behavior. The implied intent is to motivate attention, which explicitly is stated as a research criterion of effectiveness to get students to make eye contact and attend to tasks. Instead of the original use of high intensity alone to motivate attention, the pool of items that factored together (Gumm, 1993) highlighted appropriate shifts in facial and bodily intensity and proximity to students as the motivator. This suggests that attention can be nonverbally intensified as well as moderated, energetically enthused or calmly intrigued, uplifted or downshifted, and expanded out or narrowed in depending on observed mental focus needs at the moment.

This aim continues into a motivational conducting approach with a slight shift in nonverbal gestures. Eyes, gaze, signals, pointing, and circulating to shift proximity to musicians all aim to alert, remind, secure, and maintain attentiveness without a word. Also gleaned from observational analyses (Gumm, 2018; Gumm et al., 2018) were body leans, head turns, nods, okays, thumbs up, and other hand signals that can motivate attention in multiple directions in quick succession or at the same time. Furthermore, attention to crucial music events and their successful execution can be nonverbally alerted ahead of, maintained or reminded during, and affirmed after crucial music events.

2.2.4 Embodied artistic expression

Expressive conducting is the gesturing of a particular set of concepts or features in a performance work. Music features are embodied by the conductor into expressive gestural shapes. As factored together statistically (Gumm et al., 2011; Gumm, 2016b), these include phrase contours and peaks, dynamics, accents, and other expressive score markings. It further includes reflecting the music's overall expressive character as marked or interpreted, as well as the interpreted emotional intent of the music. Along with mechanical precision, this is a music-focused approach and includes well-timed synchronization of sound, in this case, synchronized expressive properties of the music.

Artistic music performance links to expressive conducting by both being rooted in musical score features and motivating expressivity through multisensory imagery and physical motion. It is the most unique and new approach of both models, drawing together content from research areas and theories of learning style, multisensory or cross-modality learning, modeling, metaphor, and imagery—which join together in presenting music visually, auditorily, and kinesthetically. This approach further links to physical technique and unrestrained tone conducting in helping musicians embody the ebb and flow of musical expression and further links to psychosocial conducting in the use of familiar musical imagery and metaphors.

Physical technique conducting uses motor mimicry of muscle strength, energy levels, size, and direction of musician exertions and motion to stimulate unified musical sound. Key instructional and motivational verbs in the process include directing, depicting, guiding, conveying, stimulating, modeling, and reminding of healthy musical techniques. Compared to musically focused expressive conducting, this approach connects directly with musicians to spark the physical production of sound, body to body, instead of abstract conceptual images that transfer to mind, body, and then sound, such as a raised or lowered hand to signal louder vs. quieter dynamic sound. The paired opposite to unrestrained tone, physical technique focuses on invigorating the production of heightened, peak, louder, or otherwise more intense musical sound.

2.2.5 Interdependent shared influence

Music concept learning motivates critical thinking using recall and problem-solving questions. This approach draws together content from all but the highest levels of the cognitive domain along with related critical thinking research (Gumm, 1992, 1993). Learning of music concepts is shown to occur in a transactional exchange with the teacher presenting concepts and then stopping input to ask students to share their fact knowledge and knowledge-based decision-making. In the exchange, students learn from each other's answers more than from the teacher and learn to make decisions more than follow the teacher's decisions.

Group dynamics motivate interdependent social learning through peer leadership and cooperative strategies. The role of the teacher is to present the intended learning goal and either place individual students in the lead to present or perform for their peers or arrange small interactive groups or sectionals to work and brainstorm cooperatively. As with music concept learning, students learn from each other's guidance, but more intentionally and inclusively, with the music teacher only involved in assuring leadership and cooperation toward assigned goals.

Psychosocial conducting uses dance, mime, acting, and other everyday gestures in the negotiation of a familiar set of gestures to which musicians will readily respond. As noted, it relates to artistic music performance in its use of everyday familiar movements. As with group dynamics, it has the intention to foster interdependent learning. As with music concept learning, it forms a transactional exchange, in this case each nonverbal gesture an open question as to how well it gets the intended response, and each musician response the answer that leads the conductor to clarify, adapt, and familiarize the gesture until the intended response is achieved. This requires vulnerability to make adjustments in musicians' favor and be open to trying gestures not traditional to textbook conducting.

2.2.6 Independent learning

In its counter role to the control of physical technique, unrestrained tone links to expressive conducting and artistic music performance teaching. The general aim is for the ensemble to make music unrestrained, yet more specifically to ease tension in physical technique, performance and social anxiety, the resulting tone color, and determination of tempo. This is done by shaping the tone in hovering, circling, flowing and lifting gestures, at most indicating tempo in nudges or shifts if not to entrust tempo to musicians. This conducting approach tinges on the full independent release of control over to an ensemble by reducing and even stopping gestures for musicians to function on their own and follow their own internal tempo. It, therefore, balances between the shared influence of group dynamics and fuller freedom of student independence teaching approaches.

Student independence involves the highest levels of the cognitive domain and components of the affective domain. These are achieved

by asking for and discussing ideas and feelings about music, values and commitments to music, evaluative critiques of music, new creative solutions to musical situations, and what is important to them in music. These are motivated by encouragement and nonjudgment of feelings, creativity, and imagination. Having students share their originality is more time consuming than the caring patience of a positive learning environment. It goes beyond the correct knowledge and application of knowledge of music concept learning to the deepest levels of learning.

2.3 Omitted approaches and aims

Something left wholly unanalyzed is which behaviors or sets of behaviors were either left out due to weak or split loadings in initial factor analyses or replaced in subsequent validity testing (Gumm, 1992, 2004b, 2016b; Gumm and Essmann-Paulsen, 2001; Gumm et al., 2011). There are three likely reasons items did not coalesce into factors. First, they were only loosely related or off-target to the central distinguishing construct of a factor. Second, they were not part of a practice that distinguished between music teachers and conductors, which is informed by the factor analysis method I used to analyze unique variance rather than shared variance that otherwise would have identified commonly used approaches. Third is that items are loaded across multiple factors, which is due to ambiguous, unclear, or multiple intentions being understood of the same survey item by different survey participants.

2.3.1 Going to extremes

Two sets of omitted items help to establish limits as to which teaching behaviors do not best fulfill the underlying learning aim of an approach. Especially they suggest how going to an extreme defeats the intended aim.

Assertive teaching stops short of demanding that students silently listen as the teacher talks, focusing on correcting errors, criticizing student mistakes, using competition to motivate learning, disciplining for inappropriate behavior, getting noticeably impatient with students, and offering rewards or punishments to get students to meet teacher demands. Omissions clarify that the focus is on asserting correctness and not being aggressive, punitive, or demeaning toward incorrectness.

On the other extreme is to stop short of being so positive and interpersonal toward students that the focus on positive learning growth is lost. This is highlighted by the omission of allowing students time to get to know each other, talk to neighbors, and help choose classroom rules, and for the teacher to admit mistakes and share personal information. Items that put the attention on student learning style differences were also omitted, including searching out individual differences, changing teaching to match the way students learn, and stopping to assist individual students. Omissions reveal the fine line between placing the focus on positive learning versus shifting the focus to the teacher being positive, students themselves, or positive interpersonal relations between the teacher and students. Certainly, a positive learning environment is motivated by students' desire for teacher approval, praise, clarification, and accommodation. However, the caution is that it can hook students on positive teacher attention and cause them to lose focus on the ultimate aim of positive learning growth.

2.3.2 Teacher talk

Of special note is how teacher talk is limited in the entire content of the music teaching model, let alone the conducting model, which is fully nonverbal. Verbal talk is limited to clear directions and corrective feedback, the briefest of directions to efficiently get to the task, clarification and affirmation, logistical directions to place individuals and peer groups in the lead, factual and critical-thinking questions to give way for student answers, musical imagery and metaphors to develop sensorial music learning and initiation of open-ended discussion for the student to express feelings and creativity. Teaching and conducting are otherwise nonverbal when monitoring student tasks and interactions, getting attention, nudging ahead using clock time, modeling by example, and nonjudgmentally observing for unique creative ideas.

This conjures a certain guiding principle to speak only as necessary to initiate and motivate an aim, then get out of the way to let learning be the primary focus. Rationally, teacher talk is a teacher/teaching action and not a learner/learning action, and it abstractly reflects back on the past or forward into the future rather than engages learner/learning actions in the present. Items in the MTSI clarify to keep teaching brief and purposefully aimed toward specific learning outcomes, thereby reducing teaching to increase learning.

2.3.3 Common music skill areas

Weak loadings omitted the common music goal of physical technique from the music teaching model, including having students drill physical technique, describe performance skills, explain relationships between performance skills, and learn from the teacher's performed examples of agility or difficult musical passages. Instead of a standalone approach and aim, omissions reveal physical technique to be a part of a coordinated pattern of music teaching aimed toward artistry—a means and not an end or smaller component used toward a deeper artistic aim.

The use of multimedia in teaching music literacy was also omitted, which would seem to relate to artistic music performance as multisensory strategies and music concept learning toward critical thinking about music. Omitted were the uses of audio and/or video recordings as students read along with the music, as musical models, and as an overhead rehearsal guide. It is plausible to view the omission of multimedia as falling outside the teacher/student exchange of music teaching or as not serving a singular, distinctive aim.

Skills of music listening and discrimination skills and the ability to think of music in their heads were also omitted. Perhaps, like physical technique, music literacy is pointed out to be a means and not a philosophical end goal in itself.

Having students probe deeper into music score analysis was also omitted. Omitted items included students analyzing the form of music, reading and translating music, determining the composer's intentions, or interpreting the music. It also omitted content about the teacher concentrating on phrasing questions well, using probing follow-up questions, and waiting for 5 s or more after a question to allow students time to think. Sensibly, these options would belabor and distract from the central aims of making active critical-thinking choices and expressing creative and affective ideas or perhaps ambiguously fall between these aims.

Other omitted items further clarify student independence as to how far to go in developing originality. These included students

comparing improvised patterns, challenging students to accept new ways of thinking, working to get students to accept and react to works of music, and helping students understand their personal feelings. Affect and creativity are shown best to be nurtured and drawn out through nonjudgmental dialogue rather than compared, challenged, worked, or helped along.

2.3.4 Lesson and rehearsal structuring

Several research suggestions for organizing learning were included in the original music teaching survey. However, none made it into the music teaching model. A mix of items created ninth and tenth factors in the initial factor analysis that were not validated by confirmatory factor analysis. I called these tentative factors flexible classroom structure, with a focus on unplanned on-the-spot decisions, and sequential instruction, with step-by-step details adding up to global understanding. Omitted items included allowing students to choose when to get out of their seats and whisper and make asides.

A third set of items implying the opposite of a sequential detail-to-holistic structure was fully omitted from the music teaching model. This content included teaching abstract concepts not teachable in a detailed manner, providing an overview or key focus of the class, teaching according to a prepared set of prioritized goals, creating a climax within the rehearsal, use of whole-class learning, and having students observe and reflect. Grading by paper-and-pencil tests or performance tests also did not sort into any distinctive approaches.

Two items too weak and ambiguous to be included in interdependent group dynamics are noteworthy. Rotating rows or shuffling the permanent seating does serve to shift the dynamic interplay across a group, yet stops short of nurturing interdependence. On the other hand, motivationally appealing to an intrinsic sense of responsibility focuses on releasing control over to students yet stops short of identifying with peer-group learning.

2.3.5 Separation of conducting approaches

In the development of the music teaching model (Gumm, 1993), all mention of conducting as a teaching approach was omitted. These included relying primarily on conducting gestures to communicate with students, teaching students to interpret what conducting gestures mean, and having a student conduct the group. These omissions affirm that separate research was required to more thoroughly distinguish approaches to conducting.

In developing the conducting model (Gumm et al., 2011), several music features did not find a place. Not connecting to expression as expected were heavy-to-light weighted accents, weight of tone, and articulation, the first likely due to opposite terms and all three unclear or split in purpose as either musical or physical/bodily features. In addition, resonant quality and section balance of ensemble sound failed to strongly identify with Expressive or Unrestrained Tone conducting, and right/left-hand mirroring and merging of expression within the right-hand meter pattern failed to identify with any particular aim.

Omitted from psychosocial conducting was a sense of unity with the ensemble rather than dominance, asking and drawing toward rather than requiring to happen, working to keep gestures fresh and unexpected, and dramatizing the story of the music. Split or multiple meanings can be found in each, though as well each seems to sway from the central focus of developing familiarity with gestures.

3 Overarching priorities

Earlier in the previous section, I concluded that different approaches are required to have an effect on different outcomes. What is more, a particular balance of approaches reveals a particular broader aim, priority, camp, school of thought, practice, or philosophy. Some add up and balance toward historical, philosophical aims, others merely show how certain approaches play a subservient role to the aim of a top-ranked approach, yet others have unique underlying aims that I did not find to match common priorities within music education.

3.1 Control and release

3.1.1 A new dichotomy out of old

Complementing previous theories and philosophies, higher-order factor analysis of music teaching approaches revealed and validated a unique pair of overarching aims that joined teacher- vs. student-oriented, extrinsic vs. intrinsic, and active vs. reflective dichotomies into dichotomous aims to cover breadth versus uncover depth (Gumm and Essmann-Paulsen, 2001; Gumm, 2004b). Later, in factoring both models' approaches together, the same pairings of teaching approaches aligned with conducting approaches in a way that suggested a new duality—to control or release (Gumm, 2016b; see Tables 1, 2).

Control is achieved in teaching by verbally asserting correct responses to task directions, nonverbally motivating attention to task, being quick and efficient to task, and affirmingly reinforcing positive learning growth. Control is achieved in conducting by being time precise, gesturally motivating attention, and guiding physical music-making efforts.

Release is achieved in teaching by an interdependent peer-learning group dynamic, asking conceptual questions, connecting artistic sound and physical motion, and nurturing independent ideas and feelings with nonjudgment. In conducting, the release is the common focus behind expressive, psychosocially negotiated, and unrestrained or tension-freeing gestures.

To be clear, there is no domineering or demeaning connotation in my choice of terms. Control is more about narrowing or drawing attention inward and toward, chiefly by extrinsic teacher/conductor control. In contrast, release is about broadening attention outward or letting go toward intrinsic outcomes.

3.1.2 Average priorities

Of these two overarching priorities, control is consistently shown to be most prevalent on average. Upfront, this seems due to both models originating within a context of ensemble teaching and conducting that mostly involves active learning aimed toward performance (Gumm, 1993, 2016a,b; Gumm et al., 2011).

Control remains most prevalent on average across all geographic regions studied. This includes research in the U.S. southeast (Groulx, 2010), mid-Atlantic (Gumm, 2004a; Basilicato, 2010; Anderson, 2013), north-central (Brakel, 1997; Gumm, 2004b, 2007; Bazan, 2011), southwest (Gumm and Essmann-Paulsen, 2001), and across mixed regions (Gumm, 1993, 2016a,b; Olesen, 2010). It also includes research outside the U.S. in Malaysia (Shah, 2005, 2007), Taiwanese in Canada (Hsieh, 2010), and Japan (Courtney, 2014).

Control of active behavioral-task learning has also remained the stable and persistent focus across generations. This observation is based on national studies of choral directions 25 years apart (Gumm,

1993, 2016a) and even when expanded to include conductors of all types of ensembles in multiple U.S. regions (Gumm, 2016b). Across the quarter century, however, differences were less polarized, reflecting overall less assertiveness and increased positive learning on average.

Control bears out to be the top priority in elementary music as evidenced in one study (Shah, 2005, 2007). Yet, release approaches are shown to be of higher priority in elementary than secondary music as evidenced in another (Bazan, 2011). The latter is a relative and not a top-priority finding; nonetheless, these expose a dearth of research applications of the MTSI and CPS in general music, whether elementary or secondary, and none in ethnic, folk, popular, community, or professional ensembles.

3.2 Diverse philosophies

In the variance on both sides of the mean average, a hidden diversity of philosophical practices was revealed (Gumm, 1993, 2016a). Applying cluster analysis, MTSI scores were sorted by commonalities among and between directors to reveal smaller groups who coordinate and balance teaching approaches toward a shared practice, common overarching aim, or educational philosophy.

3.2.1 Music performance

Five cluster groups reveal different degrees to which music performance is prioritized. Each balanced different types and levels of control with and without the release of deeper learning.

The first two reveal a slight shift in focus in managing on-task behavior. The first group I called Task Oriented (Gumm, 1993) by moderate priority toward control of active task learning topped by efficiency and correctness. With no high-priority learning aims, it seemed a basic aim to be correctly on task more of the time. Of note, 25 years later, a group I called Task Nurturing (Gumm, 2016a) retained efficient productivity as the top priority yet showed less assertiveness and more nurturing of positive learning—reflecting the same shift as revealed on average between the 1990 and 2015 samples.

One group in the 1990 sample enhanced a traditional music performance approach with a top priority toward embodied artistry, underlaid by nonverbal attention-getting and corrective approaches. The lowest priority toward time efficiency seems appropriate given how artistry requires a more start-and-stop use of time to link sound and body toward expressive musical performance. I interpreted their global aim as most fully Music-Performance Oriented. No group in the 2015 sample showed a similar balance or global aim.

Priorities toward even deeper learning aims centered around music performance were found 25 years apart. The earlier group I called Discovery Oriented for its top mix of priorities toward group dynamics and artistic music performance, followed moderately by student independence with support of nonverbal motivation (Gumm, 1993). Learning seems focused on self-discovery through shared contributions, the embodiment of expression, and feelingful and thoughtful responses guided silently with teacher enthusiasm. In the 2015 sample (Gumm, 2016a), a group cluster of choral directors I called Engaged Discovery enhanced the artistic embodiment of music and independence of feelings and ideas with an engaging question-and-answer exchange and more efficient use of time in place of shared group leadership.

3.2.2 Comprehensive musicianship

Four groups showed even closer coordination between conceptual, artistic, and independent learning—the pillars of perform, analyze, and create that define comprehensive musicianship. The key difference between these groups shows a merging of two prior dualities: performance vs. comprehensive musicianship and teacher- vs. student-oriented.

Within the 1990 sample (Gumm, 1993), the assertion of correct behavior was given low priority by the first comprehensive musicianship group and high priority by the second. I called these Student-Centered Comprehensive Musicianship Oriented and Teacher-Controlled Comprehensive Musicianship Oriented.

Then, in the quarter-century follow-up study (Gumm, 2016a), the polarity of teacher vs. student dissipated into what I called Shared-Influence Comprehensive Musicianship and Energetic Comprehensive Learning. The first had a complementary balance of positive, efficient, and motivating approaches, with assertiveness well in balance as well. The second supported comprehensive priorities by being highly positive and nonverbally enthused yet far less assertive. The decreased polarity coincided with less focus on asserting correctness and a greater focus on positive learning and time efficiency across the national sample.

3.2.3 Conceptual learning

To teach about music being performed was a key philosophical counter aim to traditional performance dating back decades in music education (Gumm, 1992). This was found to be a priority in three cluster groups.

Surfacing in the 1990 sample (Gumm, 1993) were a Concept-Presentation Oriented group and Content Oriented group. The former was similar to Task Oriented in its moderate priorities toward asserting correct and efficient task learning, yet was supported by conceptual questions. This met the philosophical aim of teaching about music being performed in its simplest form. The latter group delved into the content of music with frequent use of all three inquiry approaches aimed toward clear and positive, music concept, and independent affective/creative learning. Less frequent use of assertiveness, peer-group learning, and efficiency served to nudge active and interactive learning in the balance.

A group in the 2015 sample (Gumm, 2016a) that I called Active Concept Application supported music concept learning with frequent use of positive, nonverbal, and efficient approaches, and moderately linked conceptual learning with artistic and affective/creative aims. This balance seemed strongest in fulfilling the philosophical argument to learn to perform with deeper meaning and understanding under the guidance of a music director.

3.2.4 Cooperative learning

Group dynamics took the forefront in clusters detected in both studies. One 1990 group of directors relied on group dynamics almost to the exclusion of teacher involvement except to keep students efficiently active and ask conceptual questions, both at lower levels by comparison (Gumm, 1993). This group I called Student/Subject Matter Interaction Oriented for simply letting students learn from each other to actively do and reflectively think about music.

Another group prioritized positive and independent learning, peaked by cooperative peer-group learning. These slower-paced approaches were tempered with moderate efficiency, assertiveness, and silent visual motivation by the teacher and enhanced by less

frequent conceptual questions and artistic strategies in a rich balance fit to a Cooperative Learning Oriented philosophy.

Even more pointedly balanced toward group dynamics was a 2015 group focused on Cooperative Affective Learning (Gumm, 2016a). A secondary mix of performance artistry and independent thinking and feeling have a commonality of musical affect, the former embodying emotionally expressive music performance and the latter facilitating the verbal expression of feelings about music.

3.2.5 Less teacher

Earlier, I pointed out how limited mention of teacher talk implies that putting less focus on the teacher teaching keeps the focus more on learners learning. Two final cluster groups, both in the 1990 sample (Gumm, 1993), inform how this works out and how it does not.

First, a group I called Low Teacher Involvement Oriented had the commonality of having students share their affective, creative, and conceptual grasp of music in clear, affirming, and cooperative interpersonal exchanges. These music directors remained uninvolved in controlling learning assertively, nonverbally, or efficiently in favor of deep intrinsic learning. These teachers, then, taught less so that learners may learn more deeply.

Second was a group I interpreted as Nonfocused Low-Interaction Oriented for being flipped upside down from the other. This group was uninvolved toward interdependent, independent, conceptual, and artistic learning aims, with ratings for positive, corrective, efficient, and nonverbally motivated learning as well so low as to suggest they were intentionally aloof and unfocused toward any particular learning aim much at all.

3.3 Sources of stability

I return to the issue of stability again in the context of stable patterns of approaches. The discussion here is how long and in what contexts do unique philosophical priorities linger.

3.3.1 Underlying latent traits

Three studies support the concurrent validity of the MTSI and CPS in measuring stable and pervasive philosophical priorities. Both rating-scale surveys were verified to measure stable latent traits underlying in-the-moment choices across time.

Though seeking to qualitatively explore band directors who scored as being student-oriented on the MTSI, as noted earlier, Bazan (2011) instead found a pervasive teacher-directed focus across the sample. Observations validated the greater priority toward teacher control, yet not much in the way of releasing deeper student learning. Interviews, however, revealed how they used freer, releasing, deep-learning approaches in early rehearsals—including after concerts early on in the next concert cycle. The greater control came closer to a concert—which was when Bazan observed them. Viewed long-range, the MTSI validly captured the overall balance of priorities weighed more toward control than the short-range focus on release. Their reported priorities panned out as being stable across the stretch of multiple concert seasons.

Second, a seasoned band conductor's (Gumm, 2018) and choral director's (Gumm et al., 2018) self-perceived conducting priorities on the CPS correlated strongly with the balance of gesture functions observed across a series of randomly chosen rehearsal episodes. Results validate the ability of the CPS to predict a long-range balance of priorities, in both cases, across the span of one or two rehearsals.

3.3.2 Place and culture

Research has further shown how the stability of teaching and conducting approaches is anchored in geographic location and cultural traditions. In short, seemingly unique and changing choices are stably grounded by the accepted practices of those around us.

There is an east-to-west drift in priorities across the U.S. corroborated by several studies. Positive interactions toward clear and careful learning take top priority along almost all of the east coast, with time efficiency falling and assertion of correctness rising in rank from southeastern to northeastern states (Gumm, 2004a; Basilicato, 2010; Groulx, 2010; Anderson, 2013). Interdependent cooperation and independent learning were the lowest priority in mid-Atlantic states (Basilicato, 2010). Gumm (2003b) found that choral directors farther east were significantly more assertive and nonverbally motivating yet nurturing of positive learning and artistry. In contrast, directors farther west were more supportive of peer-group dynamics and student independence. However, only peer-group learning continued to be a greater Western priority 25 years later (Gumm, 2016a), yet an east-to-west trend toward greater unrestrained and psychosocial ensemble autonomy in conducting adds to a general drift toward supportive instruction farther west.

In the upper central region of the U.S., Brakel (1997) found select band directors to be the most time efficient regardless of individual differences of gender, degree level, or school size. Bazan (2011) found band directors in the region to place the most emphasis on time efficiency, with other controlling approaches following in rank. Choirs in the region, however, ranked their directors as being most positive and efficient, followed by nonverbal motivational and assertive control (Gumm, 2004b). University ensemble members associated efficient and positive approaches with professors viewed as most helpful to their learning and independent learning as preferable over assertively correcting them (Gumm, 2007). This same nudge toward efficiency was found in select Kansas school bands (Gumm and Essmann-Paulsen, 2001), followed by assertive control and then affirmation of positive learning in rank order.

This tradeoff between positivity and efficiency takes on cultural significance in international comparisons. Hsieh (2010) profiled Taiwanese private music teachers in Canada, finding a contrast between conceptual, artistic, and positive approaches suited to Western cultural values and an efficient and assertive approach focused on obedience suited to traditional Chinese/Taiwanese cultural values. Japanese band directors were shown to emphasize assertive teaching, nonverbal motivation, and group dynamics more than a comparative sample of U.S. band directors who put more emphasis on a positive learning environment, music concept learning, and student independence (Courtney, 2014). Time efficiency was a similarly high priority for both.

3.3.3 Context

Finer contextual situations have been found to further anchor instructional and motivational priorities in place (see Table 2). Most circumstances of career positions are shown to steer instructional and philosophical priorities in distinct directions.

The first contextual anchor is the size of the program. Brakel (1997) found significant correlations between band size and positive learning (inverse) and artistry learning aims, and a music-concept

approach and school size, perhaps the lower general affirmation a reflection of more intentional deeper music-learning goals with larger groups. On the contrary, in the smaller geographic region, Bazan (2011) found that the larger the band program, the more assertively and efficiently band directors taught, and the smaller the school enrollment, the more nurturing directors were of independent feelings and ideas. With directors of mixed ensemble types across mixed regions, Gumm (2003b) identified school size as being of significant influence on assertive and nonverbal motivational control and peer-group, concept learning, and student independence release, which altogether suggest larger schools provide for greater exploration of varied learning aims.

Second, rehearsal time and timing are implicated as having an influence on priorities. Bazan (2011) found greater affirmation of positive learning in directors who have fewer numbers of rehearsals and that directors were more nonverbally motivating and inquisitive in asking conceptual questions in ensembles with a greater number of concerts per year. As previously noted, Bazan also found priorities to shift from releasing to controlling approaches in rehearsals farther to closer away from concerts. Furthermore, directors with a greater number of performances were found to affirm positive learning and motivate nonverbally more.

Third is the grade or experience level taught. Gumm (2016a) found that assertion of correctness and nonverbal motivation of attention both in teaching and conducting lowered across choir levels. This reveals that as students advance, these burdens on teachers decrease. With directors of a range of ensemble types, Gumm (2016b) found that those who most conduct ensembles higher in grade, age, or experience level seem to sway toward expression. This also shows greater release as students advance in grade level. Research has yet to study adult community and professional ensembles of varied levels of ability and experience.

Fourth is the type of ensemble most centrally taught. Findings in relation to conducting (Gumm, 2016b) suggested that a career position focused on teaching instrumental, choral, or general music seems to anchor how much or little control is taken over musical precision and a musician's physical technique. Conductors at the university level demonstrated distinct priorities logical to the nature of the ensemble, especially higher priority toward precision in orchestra and physical technique in band and choir (Gumm, 2018; Gumm et al., 2018). Sorting MTSI research by ensemble type, bands seem most efficiently focused (Brakel, 1997; Gumm and Essmann-Paulsen, 2001; Bazan, 2011), even more so with Japanese bands (Courtney, 2014), and choirs consistently place positive learning above efficiency (Gumm, 2003b, 2004b, 2016a). This is yet another issue that requires further research to sort out. However, on the surface, such results make sense to the general historical band and choir traditions. Further research is also needed to see how traditions of other types of ensembles pan out in practice, such as contemporary pop a cappella as well as folk and ethnic music ensembles.

3.4 Sources of change

It is in the relative portions of control approaches and precise mix of release approaches where developmental changes in music teaching and conducting are found. What seems to shift priorities is our experience, situation, and background (see Table 2).

3.4.1 Career experience

As noted earlier, priorities toward control remained relatively stable over the years in the choral music field, yet relaxed slightly by way of reduced assertiveness and less polarized differences between philosophical aims. However, a clear and consistent pattern is evident when it comes to individual change across years of experience—a pattern that I can plausibly describe as deeper, freer, and wiser (see Table 3; Gumm, 2003b, 2004a, 2016a; Bazan, 2011; Gumm and Simon, 2011).

In brief, music teachers start out inefficient yet rather experimental in trying out different approaches; in the first 3 years grow more efficient; by year eight come to share control by facilitating peer-group leadership; by 10 years and increasingly starting year 20 grow significantly more conceptual, artistic, interdependent-group, positive, and efficient. As shown in Table 3, I call these a novice *Self-Reflective Stage* for the greater focus on self in the new teaching role, a competent teacher-centered *Broadening Stage*, a letting-go *Interdependent Transition*, and seasoned or veteran mid-to-later-career *Deepening Stages* more fully freeing of student learning.

Time rises into consideration again in the context of career development. Gumm (2003b, 2004b) found that choral directors of less experience prioritized time efficiency most—as they first worked to gain control. Experienced teachers then grew less time driven.

Gumm's (2016a) findings 25 years later support this pattern of development. With increasing years of experience, directors grew more nurturing of positive learning and more releasing in the use of interactive group dynamics and conceptual questions. Foremost, nonverbal motivation—though a method of control—was revealed to serve as something of a gateway to greater release of control, that perhaps sharper awareness of students' and musicians' attentional focus opens awareness to their deeper self-regulated capabilities.

However, other researchers corroborate only certain facets of career growth. Brakel (1997) and Olesen (2010) corroborated only an experience-based shift toward peer-group or peer-led learning. Bazan (2011) found a strong correlation between the use of peer-group leadership and years of experience and years in the present position and a negative experience-based correlation with positive learning. Anderson (2013) found no differences in music teaching approaches based on years of experience, though the fact that "Equal representation with respect to directors'… years-of-teaching experience were limited" (p. 79) casts doubt on this contrary finding. Again, despite the more substantial concurring evidence, further research is required to assure these facts and interpretations are generalizable.

Experience-related shifts in conducting have been studied less, leaving future research to sort out more thorough patterns of development. Gumm and Simon (2011) found that motivational and physical technique conducting approaches increased with years of experience. Gumm (2016b) corroborated expressive and unrestrained conducting as the two key developments across years of experience. Though I sorted current findings logically in line with music teaching stages (Table 3), future research of the conducting model is required to empirically sort out progressive stages of development.

3.4.2 Impactful experience

Education is a form of experience that is shown to be quicker in changing well-anchored pedagogical approaches and philosophical

TABLE 3 Trends of career experience development.

	Teacher dependent		Interdependent	Student independent
	Years 1–2 Self-Reflective "Novice" Stage	Years 3–7 Broadening "Competent" Stage	Years 8–9 Shared-Influence "Letting Go" Stage	Years 10–19 & 20+ Deepening "Wise Choices" Stages
Advantages	Beginner's enthusiasm & eagerness Creativity and spontaneity	Time efficiency--less wordy, quicker to task Assertive teaching--more externally aware and in control of classroom behavior, able to hold students to task Motivational conducting—attuned to attentional needs, opens awareness toward next stages of development	Group dynamics—shares the burden of decision making by developing student shared leadership Psychosocial conducting—vulnerably adapts so gestures are familiar	Generally more releasing as with earning a higher degree A new aim for students to learn to learn on their own, more deeply and meaningfully Time efficiency and gesture precision become more pertinent and coordinated to varied learning aims On balance, more expressive with an integration of physical technique and unrestrained conducting
Problems	Inefficient time management Wordiness—slow to task Potential burnout with growing efficiency and assertiveness Less expressive in conducting	Quick paced controlling approach can be task-oriented and lack deeper learning aims The tightly controlled environment puts a heavy decision-making burden on the music teacher/conductor Together these may lead to increased burnout symptoms		Student self-responsibility and shared leadership, taken to an extreme, may lead contributing less, being distant and aloof, and less connection with students

aims. Research has uncovered movement training, educational degree earned, and workshop training as influencers of change (see Table 2).

First, movement methods were shown to have a modest but significant and widespread impact on conducting priorities, with training in multiple methods shown as a quicker route toward being a more musician aware and responsive conductor. Gumm and Simon (2011) revealed and Gumm (2016a) corroborated how responsive musician-oriented conducting develops through combinations of movement methods. Effective in swaying priorities in directors of a range of ensemble types (Gumm, 2016a) were dance in relation to expressive, motivational, unrestrained tone, and psychosocial conducting priorities; Alexander technique toward mechanical precision, physical technique, unrestrained tone, and psychosocial conducting priorities; acting with impact on physical technique, unrestrained tone, and psychosocial conducting; Feldenkrais toward precise and motivational conducting; and Dalcroze Eurythmics on unrestrained conducting. With choral directors alone (Gumm, 2016a), precise conducting was lower for Alexander and higher with mime, and expressive conducting was higher with yoga and mime; motivational conducting was lower with Alexander and higher with mime and acting, psychosocial conducting was higher with mime, physical technique conducting was higher with mime and acting, and unrestrained conducting was higher with dance, kinesics, and Dalcroze Eurythmics. The general movement method of Laban was not shown to sway priorities in conducting.

Toward shifting choral directors' teaching priorities (Gumm, 2016a), mime impacted nonverbal motivation and artistry; Kodály impacted nonverbal motivational, efficient, peer group, and conceptual aims; kinesics influenced all but assertive teaching aims; Dalcroze influenced higher priority toward conceptual learning; yoga impacted peer group, conceptual, and independent learning aims; dance had an effect on peer group, artistry, and independent aims, and Tai Chi impacted artistry and independent learning aims. Teaching priorities were not found to significantly vary by music pedagogies of Gordon or Orff, the general movement methods of Alexander, Feldenkrais, or Laban, nor by training in acting. What this suggests is that while certain name-recognized pedagogies may be adopted for their particular benefits, they are not shown to shift or sway choral directors' overall teaching approach one way or the other. Olesen (2010) similarly found that abiding by the aims of an existing method—in this study, a particular warmup method—showed little relationship with the music teaching approach as measured on the MTSI except perhaps for warmups to guide independent thinking across the subsequent rehearsal.

Second is the quicker impact of an advanced degree relative to and separate from years of experience. Brakel (1997) found select band directors in a region of a single state to not have developed different priorities based on degree level. In the 1990 national choral directors sample (Gumm, 2003b), degree level likewise was not found to predict higher priority toward music teaching approaches, though it was associated with lower festival ratings. Higher degree levels in the 2015 choral director sample predicted greater nonverbal motivation, time efficiency, and music concept learning in teaching and higher priority toward all but the psychosocial factors of conducting (Gumm, 2016a). With directors of varied ensembles (Gumm, 2003b), higher degree levels showed heightened priorities toward expressive and unrestrained-tone conducting approaches.

Third, professional development clinics and workshops are an alternative that has a relatively small impact, as shown in the initial 1990 sample of choral directors (Gumm, 2003b). In the study, workshops were found to have a slight effect on increasing artistic music performance, as well as being linked to directors who participated in festivals.

3.5 Different perspectives

Research of these music teaching and conducting models reveals how perceptions of the actions of the same teacher or director differ when viewed from different perspectives. In this section, we compare the external perspectives of the ensemble and expert observer with the internal self-perceptions of music teachers/directors, as well as that of resulting outcomes.

3.5.1 Music teacher/conductor

Music conductors have been found to not consciously grasp all of their own actions right up front. In video-recall interviews (Gumm, 2018; Gumm et al., 2018), conductors initially noticed and described only those approaches that met conscious priorities, then in subsequent viewings of themselves, added prompts to look for gestures fit to each of the model's six conducting aims sparked recognition and affirmation of previously unnoticed gestures—including ones conductors had previously described as philosophically opposed to their conscious efforts. This suggests that much of the rapid decision-making in conducting is reflexive and subliminal, taking no time for conscious thought to react in the moment.

Even so, conductor self-descriptions came to highly correlate with CPS self-ratings after summing unprompted conscious self-observations with prompted realizations of self-behavior. This suggests that in the process of rating gestures item by item without foreknowledge of which fits in a pattern with others, the CPS validly sums up conscious and unconscious priorities. This fits the nature of latent—which means hidden—traits that underlie human actions.

3.5.2 Students/musicians

Two avenues of research inform student ensemble musicians' external view looking back at the educator/conductor. First is student actions or decisions in response to conductors with different priorities, and second is asking musicians to rate and describe their conductors.

Student retention and attrition are informative indicators of student responses to a conductor. Brakel (1997) found that no single music teaching approach predicted attrition and retention in instrumental programs but that combinations of approaches did have a significant predictive effect. Specifically, traditional directors with aims to control behavior had higher dropout rates, and directors who developed independent autonomy and performance artistry to greater extents had higher retention. The fact that coordinated approaches predicted students staying or leaving supports the greater motivational role of the implicit priorities and philosophy in the pattern of teaching.

Ensemble musician MTSI ratings of their conductors were found to differ by how they uniquely learn and are motivated. Ensemble members in two bands (Gumm and Essmann-Paulsen, 2001) and four choirs (Gumm, 2004b) were found to rate directors as foremost controlling of active learning and rate themselves as motivated by personal effort and musical ability to succeed in music. Directors' efforts to keep musicians actively engaged in music are precisely what would catch the attention of students able and willing to put active effort into succeeding. Yet differences in perceptions of directors surfaced when motivational attributes were broken down. Those who noticed controlling approaches to greater extents were musicians motivated more by effort, musical ability, class environment, and preference for music over other activities and less by personal commitment. Musicians motivated by their affective enjoyment of music noticed positive, group dynamic, and conceptual learning aims to a greater extent—all of which allow students to share what they enjoy about music. Those motivated by their experiential and family background in music also noticed peer-learning group dynamics to greater extents, as well as strategies aimed toward artistic music performance and independent learning—all of which let them apply their unique background experiences. In addition to noticing controlling approaches, those motivated by the ensemble class environment to greater extents also noticed directors' efforts to promote interactive class discussion of independent feelings and ideas to greater extents.

Comparing student MTSI and university faculty evaluation survey ratings, Gumm (2007) found band, jazz band, orchestra, and choir students evaluated efficient and positive teaching approaches as most effective and helpful toward their learning and getting to share their independent insights as more preferable over assertively being told what to do. Artistic performance strategies were viewed as being better prepared and being asked to interactively learn from their peers as being less prepared yet a trait of a more accessible conductor. Comparing self-attributed motivations to succeed in music, more experienced, able, and effort-oriented musicians thought less of conductors' positive interpersonal sociability. In contrast, those motivated by affective enjoyment of music thought more of conductors' sociable respect.

Research on conducting priorities (Gumm, 2018; Gumm et al., 2018) has found student views of conductors to be reliable, valid, and consistent with either the conductor or expert observer, seemingly due to either the career stage of the conductor or ensemble type. Ensemble CPS ratings correlated (a) strongly with observation analysis and CPS ratings of an early-career conductor, (b) very weakly with observations and moderately with CPS ratings of a late-career conductor, and (c) strongly with researcher observations, moderately strongly with conductor interview content, and strongly with a random member's interview content. In interviews, the early-career choir director and singers grew more conscious of gesture intent with increasing stages of prompts. In contrast, the late-career choir and band conductors and musicians were more directly conscious of similar functional gesture intentions, which the choir conductor explained were developed and pre-planned.

3.5.3 Expert observer

Earlier, it was pointed out how limited observations did not representatively capture the balance of approaches, aims, and priorities across broader swaths of time (Bazan, 2011). Also pointed out earlier was how representative observational procedures correlated differently with measures from other points of view depending on conductor experience level and perhaps ensemble type (Gumm, 2018; Gumm et al., 2018). An expert observer's view has been shown to correlate highly with ensemble surveys of an early-career choir director and late-career university band director—pointing out their similarity as external views looking in on the conductor—or correlate weakly with ensemble ratings of a late-career choir director.

On the other hand, an expert observer can sum up priorities similar to self-ratings and self-descriptions of experienced band and choir conductors—pointing out their similarity of expertise—yet weakly with self-ratings and interview content of a choir director in the early years of university conducting. Though relatively scant to this point, this evidence corroborates experience-based findings across the body of research.

3.5.4 Effects and outcomes

Effective approaches to teaching and conducting typically are linked to a select criterion of effectiveness or success. Neither the music teaching nor conductor models were developed in relation to preselected criterion measures, and instead, the criterion or aim was interpreted as factored patterns. Nonetheless, certain outcomes have been found when higher priority is shown toward select approaches.

Measures of student learning would serve as a direct indicator of effective music instruction, an option only loosely applied to the music teaching model. Bazan (2011) found that the students of band directors who facilitated peer-led learning more frequently had significantly lower standardized test scores; this approach was more likely an accommodating remedial choice rather than a cause of lower test scores. Anderson (2013) found that efficient, independent, and artistic (inverse) learning approaches significantly correlated with students' self-reported learning success. This suggests that a balance of staying efficiently on task and having students explore their unique feelings and ideas either promotes student learning overall or attracts higher achieving students and perhaps artistry attracts or assists less successful learners.

A cautionary finding is a career outcome found to occur with over-emphasis on assertive and efficient teaching—increased symptoms of teacher burnout (Gumm and McLain, 2013). Both approaches together require quick and numerous decisions to the point of potential burnout. This pairs with the detrimental effects of control-oriented teaching on student dropout (Brakel, 1997). Music teachers with fewer burnout symptoms may have been less controlling in the first place or, as implicated by experiential trends, may have overcome burnout and survived in the profession by learning to be more releasing.

A traditional measure of effectiveness is the rating received at festivals and competitions. Initially used to establish the predictive validity of the MTSI (Gumm, 2003b), higher choir festival ratings were achieved by choral directors who applied nonverbal motivational and artistic music performance strategies to greater extents. In contrast, Olesen (2010) found that it was a balance between time efficiency and student independence, with less assertiveness, that predicted choral directors' professional and choir success. In further contrast, band directors who earned higher competitive band ratings were found to be more efficient and conceptual, more assertive, and less nonverbally motivating (Groulx, 2010). Directors who had their band compete more were also more efficient and conceptual, yet less correctively assertive, positively reinforcing, nonverbally motivating, and group interactive. Contrasts require further research to resolve whether certain findings are spurious or due to contextual differences between ensemble types, regions, or time constraints.

A less subjective performance outcome to expert ratings at festivals and competitions is the objective ensemble sound properties that result from different combinations of conducting approaches. This has been analyzed of only one conductor in one available study (Gumm, 2018), in which noise and harmonic dissonance, tone color, volume, and loudness levels were shown to fluctuate in logical relation to observed conducting approaches. For example, motivational gestures shifted tone and volume, physical technique gestures increased sound and broadened and sharpened tone, and unrestrained gestures reduced noisiness and loudness and darked and refined tone.

4 Discussion

The purpose of this study was to summarize the research of Gumm's empirical models of eight music teaching and six conducting approaches and their application in the profession across three decades toward varied philosophical aims. Synthesis of distinct results led to a hierarchical structure across this writing, revealing how behaviors coordinate into approaches, approaches coordinate into overarching priorities, and overarching priorities link to philosophical practices and schools of thought. Discussion of insights, conclusions, and future research directions—in addition to those posed earlier—follow this same structure.

4.1 Approaches

Key insights from this body of research are that each distinct approach motivates a unique learning outcome, unique learning aims are motivated in unique ways, and therefore, motivation of music learning depends on the intended learning aim. Furthermore, different approaches are required to have an effect on different outcomes. The conclusive lesson is to not merely apply a conducting gesture or teaching behavior situationally but tied to a broader mindful aim in coordination with other relevant gestures and behaviors.

To be clear, I would not conclude to say that content items omitted in initial model development are not done or not to be done, just that practicing music teachers and conductors, on the whole, did not report using or coordinating these behaviors consistently, strongly, and distinctively enough to count. This is a key limitation in this body of research, that all results are based on self-perceived behavior—yet corroborated from other perceptual viewpoints—and on the assumptions designed into factor analysis and other descriptive and multivariate statistics. Omissions help distinguish the diverse professional practices of a diverse range of practicing professionals, nothing more.

4.2 Overarching priorities

Particular schools of thought or philosophical aims are put into practice through a particular combination of behaviors toward a particular combination of approaches. If for nothing else, this body of research shows how historical philosophies have been implemented and practiced in real time and real contexts. Of historically recognized single-aim dualistic approaches, most were refined and elaborated more than confirmed outright, helping to clarify a delicate balance in their meaning and intention. However, research has yet to identify cluster groups of conductors by similar conducting philosophies, the same as done with the music teaching model, chiefly because the model accounted for pre-existing trends identified in the field of research.

Geographic findings seem to align with historical, philosophical trends, with eastern and north central U.S. being where the strict performance ensemble tradition in the U.S. first originated and spread. Western U.S., more at a distance from performance ensemble roots, shows a loosening of control toward more creative and effective intentions, something like a stereotype of its historical character as well. Once established, a tradition is conserved by continuing educational practices, as the evidence seems to support. However,

continued research is still warranted in tracing shifts across time, place, culture, and other individual differences. If for no other reason, this research helps toward understanding the roots of our identities, sense of purpose, and place in our profession, whether following along or striking out in seemingly new directions.

It is plausible that deeper control-releasing approaches do not add up as higher priorities in early-career music teachers because related behaviors are not used in coordinated ways. It is only when the full complement of behaviors is rated highly that it would rise to a higher rank in the balance. Therefore, the difference may be that experience leads to more coordinated and focused teaching around deeper teaching and musician-oriented teaching and conducting. A plausible alternate interpretation is that seasoned teachers come to see behind the extrinsic exterior of behavior to see intrinsic or internal subtleties underlying student behavior. Development of releasing approaches may also take time and experience because they are more subtle and not consciously comprehensible to preservice and early-career music educators—whose primary need may simply be to learn how to extrinsically take control.

A concern posed by this body of research is whether the active, breadth-oriented, controlling approach consistently found most common on average reflects a relatively low proportion of music teachers who persist in the field—that control as an early-career trait skews the average. The average accepted approach across the profession may simply reflect greater numbers of novice and early-career music teachers and fewer of greater experience. This further suggests that plans to develop deeper learning across grade levels may be stymied by a lack of experience to carry them out. Or perhaps such deeper, long-range learning goals are put into place by professionals of longer experience. It may simply take a long experience to manage deepening goals across students' long-range school experience. Music teacher retention is, therefore, highlighted as a crucial concern in meeting national core standards and other differentiated and deep-learning educational goals.

4.3 Pedagogical implications

In this balancing of approaches, a conclusive lesson is that there is so much more to music education than getting music students and ensemble musicians to follow the music teacher's or director's lead. All presumptions that music teachers and conductors are dictatorial and authoritarian are quashed by this research. Our profession needs to learn from our very finest, who come to learn from learners. We all can tap into our learners' unique intrinsic feelings, ideas, influences, and abilities at any time. On balance, just as there is musical fall and rise, contraction and expansion, downbeat and upbeat, loud and quiet, and harmonic and cadential tension and release, so too can music instruction restrain and unrestrain, downshift and uplift, narrow in and widen out, grab hold and let go, and intensify and ease off. All that is needed is to ask, discuss, group up, reduce or stop moving, and check in to find what is being felt, understood, and able to be done collectively or alone—which then better informs and customizes what and how to teach or conduct.

This leads to a suggested sequence across educational and professional development programs. First are the specific instructional and motivational behaviors of each approach (see Table 1) for music teachers and directors to learn to coordinate toward purposeful aims (see Table 2). An evidence-based sequence (see Table 3) would be first to develop how and when to focus learning behavior toward productive, correct, attentive, and clear and positive learning aims. Scanning a music class or ensemble for in-the-moment needs and accomplishments and responding with nonverbal alerts, nudges, and affirmations opens the gate toward forming deeper bonds, connections, unity, and flow states, all linked as one. The transition to deeper stages then starts by simply drawing out exemplary musicians to help set the example, adapting musician motions and ideas into conducting and teaching decisions, and asking peers to help influence and be influenced by each other's understandings and performance movements. This would be followed by approaches aimed toward artistically expressive, interdependent, or independent learning aims. Such a sequence could be applied by professional development planners in providing workshops suited to varied developmental needs and experience levels and by school administrators in evaluating effectiveness in relation to appropriate developmental trends. Overarchingly, career development seems a matter of learning to coordinate behaviors toward the specific aim of each approach and to coordinate approaches toward a broader philosophy.

A subsequent implication is a deeper insight into the powerful instructional and motivational roles of a teacher or conductor. The key to motivation is to draw attention to specific and intentional forms of learning and not place attention on non-learning such that it may motivate more non-learning by heightened attention and highlighted examples. In short, the implication is that whatever is motivated to attention grows.

These multivariate models of music teaching and conducting are shown to be serviceable, functional, matter-of-fact, purposeful, thorough, and practicable ways to put philosophy into action. Knowingly or not, whatever is motivated to attention also motivates a particular philosophy of music education. Toward making decisions more conscious, the eight music teaching and six conducting approaches are empirically validated as pedagogical foundations ready to implement the historical, philosophical, and psychological foundations of music education.

Author contributions

AG: Writing – original draft.

Funding

The author declares financial support was received for the research, authorship, and/or publication of this article. Publication of this review was supported by Central Michigan University Faculty Research and Creative Endeavors, Vice Pres/Research & Innovation, and Dean/College of Arts and Media funds.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 31 January 2024
DOI 10.3389/fpsyg.2024.1324100

OPEN ACCESS

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RECEIVED 19 October 2023
ACCEPTED 02 January 2024
PUBLISHED 31 January 2024

CITATION
dos Santos Silva C, Araújo MV and Marinho H (2024) Attitudes in music practice: a survey exploring the self-regulated learning processes of advanced Brazilian and Portuguese musicians.
Front. Psychol. 15:1324100.
doi: 10.3389/fpsyg.2024.1324100

Attitudes in music practice: a survey exploring the self-regulated learning processes of advanced Brazilian and Portuguese musicians

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Introduction: This study aimed to investigate the Self-Regulated Learning behaviors of advanced Brazilian and Portuguese musicians and how these processes vary in terms of gender, nationality, musical instrument, quantity of practice, expertise, and professional experience.

Methods: 300 participants fully completed the 22-item questionnaire "Attitudes in music practice". The sample comprised of 54.3% males, 44.0% females, and 1% non-binary; 0.7% did not respond. 68.0% (n = 204) were Brazilian, and 32.0% (n = 96) were Portuguese. The mean age was 32.70 years old (SD = 11.261), the mode was 22 years old, with a range of 18 to 66 years. Data analysis procedure included exploratory factor analysis, internal consistency, independent sample t test, analysis of variance (ANOVA), and chi-square tests.

Results: Exploratory Factor Analysis generated three factors: Practice Organization, Personal Resources, and External Resources. The results report there are no differences in SRL scores in terms of gender, nationality, and musical instrument. However, One-way ANOVA test results convey differences in SRL scores and the quantity of practice and expertise with those musicians who reported practicing for longer periods scoring more highly than participants who declared spending less time on daily practice.

Discussion: The results for the expertise variables suggest that more experienced and older musicians scored higher in Personal Resources and lower in External Resources indicating that, as musicians gain in experience, their metacognitive processes become more evident than the social factors of their performance.

KEYWORDS

self-regulated learning, music practice, survey, advanced musicians, exploratory factor analysis

1 Introduction

Musicians who achieve high levels of proficiency invest a significant amount of their time practicing their instrument and continue to train in order to maintain excellent performance levels. However, the quality of this practice is of utmost importance as the outcomes do not solely depend on the quantity of hours invested (Ericsson et al., 1993; Williamon and Valentine, 2000; Byo and Cassidy, 2008; Bonneville-Roussy and Bouffard, 2015). Research into musical

practice has focused on investigating the factors rendering practice efficiency beyond quantity of practice, discussing processes such as how to set personal goals, sustain focus, and persevere in error correction as well as how best to address challenging musical sections (Ericsson et al., 1993; Araújo, 2016; How et al., 2022).

A comprehensive review of music practice research from 1928 to 2020, conducted by How et al. (2022), demonstrates the influence of psychological methodologies on this domain. Their analysis reveals that popular topics and extensively cited articles revolve around psychological constructs such as deliberate practice, motivation, and self-regulation. The role of self-regulation, defined by Zimmerman (2000), p. 14 as "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" in learning processes, may be temporally distributed as described in Zimmerman's cyclical model (Zimmerman, 2000; Zimmerman and Campillo, 2003). Zimmerman's model comprises three phases: Forethought, Performance/Volitional Control, and Reflection. In the Forethought phase, learners employ various actions and strategies for task analysis and goal setting. This is motivated by their self-efficacy beliefs, outcome expectations, and perceived value of the task. Self-control and self-observation are essential during the Performance/Volitional Control phase for the proper employment of learning strategies. This includes focus maintenance, self-monitoring, and other metacognitive subprocesses. During the third phase, Self-Reflection, the learner conducts self-evaluation and manages self-reactions. These self-reflective conclusions feed into the next learning cycle, influencing the subsequent Forethought phase of the model (Zimmerman, 2000).

The model was adapted to music learning and performance by McPherson and Zimmerman (2002, 2011) and extensively applied to music research in order to investigate metacognitive aspects of music practice and performance (How et al., 2022). Even advanced musicians can benefit from SRL strategies and improve their musical performance and daily practice (Clark and Williamon, 2011; Pike, 2017; López-Íñiguez and McPherson, 2020).

From a cognitive point of view, the most conventional definition of a musician is someone who has the ability to play an instrument or sing, this ability being acquired through years of practice (Hallam, 2010; Zhang et al., 2020). Thus, most studies consider the amount of deliberate practice, which is formal and supervised by a teacher, as a primary factor in the development of musical expertise. In Western music, this type of practice occurs mainly in conservatories and higher education music institutions.

According to previous literature (Ericsson et al., 1993), advanced musicians were defined as those who had at least 10 years of experience with their main instrument. However, as research in musical practice has increased, musicians enrolled in higher education institutions, such as universities, professional conservatories and other tertiary institutions, who are preparing to become professional musicians or already working professionally, have been also designated as advanced musicians (Papageorgi et al., 2010; Araújo, 2016). In this study, we will use "advanced musicians" to refer to these individuals. Advanced musicians exhibit practice skills similar to deliberate practice, engage in a focused manner during practice, and have received adequate training to organize their practice based on the technical, theoretical and interpretative aspects of music (Williamon and Valentine, 2000; Miksza, 2015). These musicians have also been described as *elite musicians* (De Bruin, 2019; Kegelaers and Oudejans, 2020; Mornell et al., 2020), *expert musicians* (De Bruin, 2017; Fasano et al., 2020), *undergraduate musicians* (Clark and Williamon, 2011; Zhukov, 2012; McPherson et al., 2019), *professional musicians* (Dos Santos and Gerling, 2011; Pike, 2017), and *college musicians* (Kim, 2010; Boucher et al., 2020, 2021).

Regarding the development of musical expertise, it is possible to consider it in relationship with the training period in higher music education. Before entering the higher education course, there is a specific test to assess the minimum musical skills required to enter the course, skills usually developed through years of practice in music schools and conservatories prior to university. Placement in the professional job market usually occurs after completing an undergraduate course in musical performance (Creech et al., 2008).

Developing musical skills is a comprehensive journey involving a combination of theoretical and practical experiences, with relevant aspects such as a first solid foundation in the theoretical and practical foundations of music, including the study of music theory, sheet music reading, counterpoint, harmony, musical analysis, history of music and constant auditory training through music perception classes. During this time, students also have constant instrument lessons and opportunities to play solo and in an ensemble, a period that culminates with the first public audition. Up to this point, we consider naming the category as students, being those who have not yet performed the mid-course recital. The mid-course recital already has a public character and is normally the first public performance of repertoire prepared under the guidance of a specialist teacher.

After the mid-course recital, musicians can be considered pre-professionals because they are already in the final year of their undergraduate course, in preparation for the final recital. Following the rationale, individuals who finished their undergraduate music course were considered professionals, as they were, by definition, ready for the job market. This categorization is justified as a way of expanding the current notion of musical expertise development, and it is the one we used in the present study.

The literature has extensively studied the quantitative measuring of SRL behaviors in advanced musicians, especially in the last decade (Ritchie and Williamon, 2013; Bonneville-Roussy and Bouffard, 2015; Miksza and Tan, 2015; Araújo, 2016; Ersozlu et al., 2017; Hatfield et al., 2017; Volioti and Williamon, 2017; Topoğlu and Topoğlu, 2018; Boon, 2020; Peistaraite and Clark, 2020; Nusseck and Spahn, 2021; Liu, 2023a). A recent review on musical practice by How et al. (2022) reports that 66.2% of the retrieved articles applied quantitative methods, with questionnaires emerging as the most common instrument type (47.4%). Initially, descriptive-correlational studies in this field employed instruments developed for general education or adaptations of these instruments, such as the Pintrich and de Groot Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich and De Groot, 1990), applied by McPherson and McCormick (1999, 2000), and Nielsen (2004, 2012) or the Self-Regulated Learning Interview Schedule (Zimmerman and Martinez-Pons, 1986), used by Clark and Williamon (2011) and Ritchie and Williamon (2013). However, music practice also involves specific behaviors and task-related demands, which prompted the need to develop a measurement instrument tailored to SRL processes related to musical learning (Miksza, 2012; Araújo, 2016).

The Self-Regulated Practice Behavior scale was designed and validated ($\alpha = 0.76$ to 0.90) for measuring the self-regulatory behaviors of beginner and intermediate musicians (Miksza, 2012). This scale has since been translated and validated in Turkish (Ersozlu and Miksza, 2015; $\alpha = 0.62$ to 0.90), Portuguese (Madeira et al., 2018; $\alpha = 0.71$ to 0.84), and Chinese (Zhang et al., 2023; $\alpha = 0.77$ to 0.86). Subsequently,

Araújo (2016) designed the "Attitudes and Sensations in Music Practice" questionnaire for advanced musicians to assess SRL behaviors and Flow sensations in advanced musicians, which has since been validated and applied in both Portuguese and English ($\alpha = 0.86$). However, considering the best practices based on recent evidence (Costello and Osborne, 2005; Worthington and Whittaker, 2006; Howard, 2016; Rogers, 2022), we deem it necessary to replicate Araújo's study, updating the validation procedures of the "Attitudes in Music Practice" scale (Araújo, 2016) as regards Exploratory Factorial Analysis, before conducting Confirmatory Factor Analysis (CFA), to avoid model specification errors. These updates will be described in section 2.4.

Quantitative studies have investigated if there are differences or relationships between SRL processes and variables like quantity of practice (Ritchie and Williamon, 2013; Bonneville-Roussy and Bouffard, 2015; Araújo, 2016; Topoğlu and Topoğlu, 2018; Boon, 2020; Zhang et al., 2023), gender (Topoğlu and Topoğlu, 2018; Nusseck and Spahn, 2021; Liu, 2023a), musical instrument (Nielsen, 2004; Liu, 2023a), expertise (Boon, 2020; Kaleli, 2021), and age (Bonneville-Roussy and Bouffard, 2015). We did not find evidence of correlations or differences between SRL scores and nationality in the reviewed quantitative studies, besides Araújo's (2016).

Thus, the purpose of the study is to explore the SRL behaviors of advanced musicians from Brazil and Portugal and how these processes vary according to gender, musical instrument, quantity of practice (measured by hours of practice per day and days of practice per week), expertise (determined from information about the participants' formal music education), professional experience (measured by years since first public music performance), age, and nationality.

In light of previous findings in the SRL literature, we formulated the following four hypotheses. First, Exploratory Factorial Analysis will identify the same dimensions as the first study by Araújo (2016); second, similar to the first application of the questionnaire (Araújo, 2016), the SRL scores will report no significant differences regarding gender, nationality, and musical instrument; third, advanced musicians who declare spending more hours per day in music practice will score higher in SRL processes; fourth, more experienced participants will score higher in SRL processes.

2 Materials and methods

2.1 Instrument

The Attitudes in Music Practice questionnaire (Araújo, 2016) applied in this study comprises 22 items (see Supplementary material) and was validated both in Portuguese and English. These items were designed to assess various aspects of self-regulated practice behaviors, such as the management and evaluation of practice goals (e.g., 'I set specific goals for my practice sessions'), time management and physical environment structuring (e.g., 'I plan the time of my practice sessions'), strategy selection (e.g., 'I am aware of the strategies that I use during practice'), self-efficacy beliefs (e.g., 'I am able to achieve my practice goals satisfactorily'), external causal attributions (e.g., 'I cannot reach my practice goals without the support of some external factors - peers, teachers, materials, environment'), help-seeking (e.g., 'I request help from others [teachers, peers, composers, musicologists and specialists]') and external resources (e.g., 'I seek information from several sources - books, CDs, videos, internet, biographies, arts, etc. to support my study').

Participants were required to rate their self-regulated practice behaviors on a 5-point Likert-type scale, based on the frequency of behaviors, ranging from 1-never to 5-always in some items, and level of agreement ranging from 1-completely disagree to 5-completely agree in other items (see Appendix for the complete questionnaire). The questionnaire also included a demographic data section, which requested information about the participants' age, gender, nationality, formal education, musical instrument, practice time (hours of practice per day and days of practice per week), and how many years from their first public musical performance.

2.2 Data retrieval

The questionnaire and the Formal Consent form (approved by the local Ethics Committee) were hosted by the Lime Survey platform, managed by the University of Aveiro, and with completed responses submitted through a hyperlink. Prior to its dissemination, we asked 9 SRL researchers and advanced musicians to answer the questionnaire between January 8 and January 9, 2021 to identify eventual difficulties in understanding experienced by participants. The responses returned by the pilot study were removed from the platform to protect the final data.

Data collection occurred during the periods of lockdown in Portugal and Brazil and all contact with participants was therefore virtual. The researchers prepared two invitations to participate in this research project, one addressed to teachers from higher education institutions, distributed by email, and the other for musicians in general and for students attending these institutions, which was disseminated by e-mail and social media in order to attract a wide range of participants.

The questionnaire link was active from January 10, 2021 until May 7, 2021. 476 people answered the questionnaire; only 306 answered the complete questionnaire correctly.

2.3 Sample

The inclusion criteria consisted of Brazilian and Portuguese advanced musicians. Based on this criteria, we removed six participants because they were under 18 years old and had limited musical instrument experience. The final sample consisted of 300 participants (54.3% male, 44.0% female, 1% non-binary, and 0.7% did not respond). 68.0% ($n = 204$) of the participants were Brazilian, and 32.0% ($n = 96$) were Portuguese.

Their ages ranged from 18 to 66 years old, with a mean of 32.70 years old (SD = 11.261), mode 22 years old; with most participants in the age range between 26 and 35 years of age ($n = 104$, more in Table 1).

Since the educational system in Brazil differs from Portugal, we organized this information from participants into categories of expertise: participants in their first 2 years of professional music education (undergraduate studies) were allocated to the Student category. Participants in their final year of undergraduate studies were classified as Pre-professionals, and participants who had completed undergraduate studies and/or undertook graduate studies were allocated to the Professional category.

TABLE 1 Age range.

Age range	Frequency	Percentage
18–25 years old	96	32.0%
26–35 years old	104	34.7%
36 +	99	33.3%

TABLE 2 Expertise categories.

Expertise	Frequency	Percentage
Student	58	19.3
Pre-Professional	80	26.7
Professional	162	54.0

TABLE 3 Musical instrument categories.

Instrument	Frequency	Percentage
Plucked strings	149	49.8
Keyboards	32	10.7
Bowed strings	38	12.7
Voice	24	8.0
Wind	46	15.4
Percussion	5	1.7
Conductors	5	1.7
Missing	1	0.3

The descriptive results identify how 54% of participants fell into the Professional category. Table 2 presents the results for this variable.

Regarding years of experience since their first public concert, the majority of participants (76.0%) declared having 10 or more years of professional performance experience and with the majority beginning their instrument lessons when they were 12 years old or younger (56.7%).

As regards musical instruments, 49.7% of participants declared playing plucked string instruments ($n = 149$), 15.3% wind instruments ($n = 46$), 12.7% bowed strings ($n = 38$), 10.7% keyboards ($n = 32$), 8% voice ($n = 24$), 1.7% percussion ($n = 5$) and 1.7% conductors ($n = 5$). Due to analysis requirements regarding the minimum number of participants in each category (Field, 2018), percussionists and conductors were not included in the inferential analysis. One participant did not register information about the instrument (Table 3).

When asked about the practice quantity, participants answered how many days per week they practiced, and how much time per day (in hours). 13.3% declared practicing 1 to 2 days per week, 23.2% practiced 3 to 4 times per week, 37.3% of participants ($n = 112$) declared practicing 5 to 6 days a week, and 26.0% ($n = 78$) practiced daily. The majority of participants declared practicing between 1 and 2 h per day (27.7%). Table 4 reports the length of daily practice hours.

TABLE 4 Practice hours per day.

Practice time per day	Frequency	Percentage
<1 h	48	16.0
1–2 h	83	27.7
4–3 h	80	26.7
3–4 h	59	19.7
> 4 h	30	10.0

2.4 Data analysis procedure

2.4.1 Exploratory factor analysis

Exploratory Factor Analysis (EFA) served to explore the structure of the scale and assess its internal reliability. The dispersion matrix was generated by polychoric correlations (Muthén and Kaplan, 1985, 1992; Baglin, 2014). Researchers suggest employing polychoric correlations when conducting EFA on data derived from ordinal variables (Baglin, 2014). We assessed sampling adequacy and factorability according to the Kaiser-Meyer-Olkin (KMO) index and significance by Bartlett's test of sphericity (Rogers, 2022). The extraction method adopted was Robust Diagonally Weighted Least Squares (RDWLS–Asparouhov and Muthen, 2010). This estimator is most suitable for categorical data and is robust in handling deviations from normality (DiStefano and Morgan, 2014). To determine the appropriate number of factors, we deployed parallel analysis with random permutation of observed data (Timmerman and Lorenzo-Seva, 2011; Baglin, 2014) that has proven to be more effective than traditional methods in accurately determining the actual number of dimensions (Timmerman and Lorenzo-Seva, 2011; Baglin, 2014). Items with factor loadings ≥0.30 were considered relevant and included in the model. We implemented the Robust Promin rotation method (Lorenzo-Seva and Ferrando, 2019). It is advisable to select oblique rotation methods for multidimensional scales, as most factors within these scales tend to have some level of interrelation, and orthogonal rotations presume that the factors are independent (Fabrigar et al., 1999; Fabrigar and Weneger, 2011; Baglin, 2014; Lloret-Segura et al., 2014; Howard, 2016). Model adequacy was assessed by the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Non-Normed Fit Index - Tucker-Lewis Index (NNFI). According to the literature (Fabrigar et al., 1999; Brown, 2015), the RMSEA values should be less than 0.08, and the CFI and NNFI results should be above 0.90. EFA was performed using the software FACTOR version 12 (Lorenzo-Seva and Ferrando, 2006; Ferrando and Lorenzo-Seva, 2017; Rogers, 2022).

2.4.2 Internal consistency

We tested the internal consistency of each factor by McDonald's Omega coefficients (Hayes and Coutts, 2020) and the Composite Reliability Index (Raykov, 1997; Valentini and Damásio, 2016; with ≥0.60 considered satisfactory). These calculations were performed by Jasp software (version 0.16.4) for McDonald's Omega, and the Composite Reliability Calculator for the Composite Reliability Index. We did not apply Cronbach's alpha coefficient due to current discussions questioning its suitability for the types of data and models deployed in psychological research, which often violate the assumptions made by this coefficient (McNeish, 2018; Hayes and Coutts, 2020). Especially in scales with a smaller number of items, Cronbach's alpha may report reliability lower than the scale actually attains (Zinbarg et al., 2006; McNeish, 2018).

2.4.3 Independent sample t test

An independent sample t-test was conducted to investigate how the "Attitudes in Music Practice" scale scores differed between groups, according to Gender and Nationality. The assumption of homogeneity of variance was evaluated using Levene's test and, when violated,

we applied Welch's statistic. Bootstrapping procedures (1,000 re-samples; 95% IC BCa) were performed to correct for the non-normality of the sample distribution and to increase the reliability of the results (Tan and Tan, 2010). We calculated the effect size according to Hedges g to account for bias in unbalanced samples in keeping with Cohen's benchmarks (Cohen, 1988); g = 0.2, 0.5, and 0.8 correspond to small, medium, and large effects (Lakens, 2013). This data analysis made recourse to IBM SPSS Statistics software (Version 28).

2.4.4 Analysis of variance (ANOVA)

One-way ANOVA evaluated the potential differences in musical practice attitudes based on the scores of the three dimensions (Practice Organization, Personal Resources, External Resources) within group variables: instrument, practice hours per day, days of practice per week, number of concerts per year, expertise, and age. The assumption of variance homogeneity was assessed using Levene's test, and post-hoc evaluation was performed using the Bonferroni correction for multiple comparisons (Field, 2018). We then applied bootstrapping procedures (1,000 re-samplings; 95% IC BCa) to obtain a higher level of result reliability, correcting any normality deviations from the sample distribution and returning more robust confidence intervals for the mean differences (Haukoos and Lewis, 2005; Tan and Tan, 2010). The coefficient ω^2 represented effect size, according to Cohen's benchmarks (Cohen, 1988, 0.01 = small; 0.06 = medium; 0.14 = large). We made recourse to IBM SPSS Statistics (Version 28) as the statistical software for this analysis.

2.4.5 Chi-square

We assessed the relationships among the categorical variables by the chi-square test of association. These relationships were deemed significant when the adjusted residuals were > 1.96 (regardless of sign).

3 Results

3.1 Construct validity and internal consistency

3.1.1 Exploratory factor analysis

We examined the dataset to identify any inconsistent and/or missing values related to participant responses to scale items with no such inconsistencies detected. However, we excluded from this analysis participants who did not respond to all the scale items. Therefore, for analyses related to the internal structure of the instrument, the total sample size was $n = 297$. Table 5 presents the univariate descriptive analysis for the 22 original items of the "Attitudes in Musical Practice" scale.

The first stage of analysis included all the 22 scale items. Bartlett's sphericity test returned a significant result [$\chi^2 = 3219.2$ (df = 231; $p = 0.000010$)] and the KMO measure (0.85772) was also above that recommended (Howard, 2016). The robust goodness of fit statistics were satisfactory (RMSEA = 0.062; NNFI; Tucker and Lewis = 0.963; CFI = 0.970) with the parallel analysis indicating the extraction of two factors. According to the two-factor model, all items achieved a relevant factor loading (≥ 0.30); however, items 6 ("I use specific strategies related to my practice goals") and 17 ("I request help from others teachers, peers, composers, musicologists and specialists") reported cross loading (see Supplementary Table S1).

We carried out further analysis to undertake the extraction of the three dimensions based on Araújo's preliminary study from 2016. The three-factor model maintained the Bartlett [$\chi^2 = 3219.2$ (df = 231; $p = 0.000010$)] and KMO (0.85772) results, and the robust goodness of fit indices returned improvements (RMSEA = 0.043; NNFI; Tucker and Lewis = 0.982; CFI = 0.987). Item 17 ("I request help from others - teachers, peers, composers, musicologists and specialists") loaded above 0.30 on only one dimension. However, item 6 still presented cross loading (Supplementary Table S2).

The model also reflects theoretical inconsistency in the distribution of items across factors. Item 5 ("I understand that my goals are challenging") was allocated to factor 3, which groups items related to the External Factors dimension. This distribution would thus hinder the discussion of this dimension as a whole. Therefore, items 5 and 6 ("I use specific strategies related to my practice goals") were excluded and we performed a new EFA.

Both Bartlett's test of sphericity and the KMO results were acceptable [$\chi^2 = 2851.7$ (df = 210; $p = 0.000010$); KMO = 0.85718]. The robust goodness of fit indices demonstrated a better fit than the previous models: (RMSEA = 0.037; NNFI; Tucker and Lewis = 0.986; CFI = 0.990). Table 6 displays the factorial loadings of this updated model.

Thus, Factor 1 comprises the items related to Practice Organization processes that incorporate the behavioral determinants of SRL (Zimmerman, 1989). Factor 2, designated Personal Resources by Araújo (2016), gathers those processes associated with personal determinants, and Factor 3, External Resources, refers to influences from the surrounding environment, which is the third determinant described by Zimmerman (1989). This analysis returns extraction scores similar to those of Araújo's (2016) primary study. Thus, analyses below will not contain items 5 and 6.

3.1.2 Internal consistency

Factor 1 internal consistency resulted in McDonald's $\omega = 0.90$; [CI 95% (0.88–0.91)], composite reliability = 0.918; Factor 2 $\omega = 0.78$ [CI 95% (0.75–0.88)], composite reliability = 0.841; and Factor 3 $\omega = 0.93$ [CI 95% (0.93–0.94)], composite reliability = 0.953.

3.1.3 Total Scores

Participants obtained a mean score of 30.13 (SD = 5.93) in Practice Organization, 28.69 (SD = 3.93) in Personal Resources, and 18.98 (SD = 3.22) in External Resources. Supplementary Table S17 contains this data and total scores.

3.2 Differences in the SRL scores deriving from the variables measured

3.2.1 Gender

The T test results for gender return no significant differences in the SRL scores between groups across any of the dimensions [Practice Organization: t (291.802) = −1.509 $p = 0.132$ IC 95% Bca: −2.36; 0.343; Personal Resources: t (292) = 1.069, $p = 0.286$ (IC 95% Bca: −0.401; 1.424); External Resources: t (291.366) = −0.937, $p = 0.350$ (IC 95% Bca: −1.023; 0.345)]. These descriptive statistics are made available in Supplementary Table S3. Considering the low sample size of participants in the non-binary category, we were compelled to conduct the test only with the male and female categories.

TABLE 5 EFA univariate descriptive analysis.

	Item	Mean	Confidence Interval-95%		Variance	Skewness	Kurtosis (Zero centered)
			Lower	Upper			
1	I set goals for my practice sessions	3.95	3.82	4.10	0.897	−0.628	−0.195
2	I set short term goals (minutes, hours, days)	3.70	3.53	3.87	1.240	−0.621	−0.342
3	I set long-term goals (weeks, months, years)	3.89	3.74	4.05	1.073	−0.732	−0.169
4	I set specific goals for my practice sessions	3.91	3.78	4.06	0.903	−0.665	−0.010
5	I understand that my goals are challenging	4.14	4.02	4.27	0.726	−0.780	0.094
6	I use specific strategies related to my practice goals	4.12	4.01	4.25	0.630	−0.841	0.959
7	I am aware of the strategies that I use during practice	4.23	4.12	4.35	0.591	−0.967	1.326
8	I use strategies that have been effective in the past	4.13	4.01	4.25	0.619	−0.694	0.336
9	I know when and in which contexts my strategies will be most effective	3.88	3.75	4.02	0.804	−0.581	0.053
10	I understand the nature and demands of my musical activities	4.38	4.27	4.50	0.614	−1.129	0.599
11	I know what I must do in order to complete my musical activities satisfactorily	4.02	3.89	4.16	0.794	−0.741	0.150
12	I plan the order of the activities of my practice sessions	3.64	3.47	3.81	1.293	−0.453	−0.702
13	I plan the time of my practice sessions	3.45	3.28	3.63	1.386	−0.324	−0.785
14	I organize the physical environment of my practice sessions	3.80	3.63	3.98	1.376	−0.746	−0.346
15	I evaluate the progress made toward my goals	3.73	3.58	3.88	1.003	−0.476	−0.408
16	I seek information from several sources (book, CDs, videos, internet, biographies, arts, etc.) to support my study	3.97	3.82	4.12	1.036	−0.734	−0.263
17	I request help from others (teachers, peers, composers, musicologists and specialists)	3.62	3.47	3.79	1.163	−0.167	−0.936
18	I am able to achieve my practice goals satisfactorily	3.80	3.68	3.92	0.637	−0.424	0.069
19	I cannot reach my practice goals without the support of some external factors (peers, teachers, materials, environment)	3.52	3.35	3.70	1.387	−0.472	−0.641
20	I understand my strengths and weaknesses	4.22	4.12	4.34	0.552	−0.687	0.055
21	I practice in order to improve my musical skills	4.50	4.40	4.61	0.499	−1.496	2.435
22	I practice in order to achieve high ratings (e.g., grades) and positive feedback	3.30	3.13	3.49	1.465	−0.228	−0.825

3.2.2 Nationality

The SRL scores when organized by nationality also presented no significant differences according to the T test results [Practice Organization: t (295) = −0.155 p = 0.877 (IC 95% Bca: −1.505; 1.251), Personal Resources: t (295) = −1.257, p = 0.210 (IC 95% Bca: −1.550; 0.302); External Resources: t (223.718) = 0.818, p = 0.415(IC 95% Bca: −0.475; 1.021)]. In turn, Supplementary Table S4 sets out these descriptive statistics.

3.2.3 Musical instrument

Levene's tests describe a homogeneity of variance across every dimension: Practice Organization [Levene (4, 284) = 0.253, p = 0.908], Personal Resources [Levene (4, 283) = 0.624, p = 646], External Resources [Levene (4, 284) = 1.744, p = 140].

The ANOVA results for differences between musical instruments and SRL were also statistically non-significant [Practice Organization: F (4, 284) = 0.469, p = 0.758; Personal Resources: F (4, 283) = 1.24, p = 0.290; External Resources: F (4, 284) = 1.10, p = 0.354]. These descriptive statistics are available in Supplementary Table S5.

3.2.4 Quantity of practice: practice hours per day

Levene's tests report a homogeneity of variance across all dimensions: Practice Organization [Levene, (4, 294) = 0.795, p = 0.529]; Personal Resources [Levene, (4, 292) = 1.053, p = 0.380];

TABLE 6 Factor loadings.

	Item	F1	F2	F3
1	I set goals for my practice sessions	0.969		
2	I set short term goals (minutes, hours, days)	0.736		
3	I set long-term goals (weeks, months, years)	0.385		
4	I set specific goals for my practice sessions	0.956		
12	I plan the order of the activities of my practice sessions	0.709		
13	I plan the time of my practice sessions	0.703		
14	I organize the physical environment of my practice sessions	0.451		
15	I evaluate the progress made toward my goals	0.636		
7	I am aware of the strategies that I use during practice		0.743	
8	I use strategies that have been effective in the past		0.484	
9	I know when and in which contexts my strategies will be most effective		0.836	
10	I understand the nature and demands of my musical activities		0.804	
11	I know what I must do in order to complete my musical activities satisfactorily		0.861	
18	I am able to achieve my practice goals satisfactorily		0.461	
20	I understand my strengths and weaknesses		0.679	
16	I seek information from several sources (books, CDs, videos, Internet, biographies, arts, etc.) to support my study			0.449
17	I request help from others (teachers, peers, composers, musicologists and specialists)			0.717
19	I cannot reach my practice goals without the support of some external factors (peers, teachers, materials, environment)			0.635
21	I practice in order to improve my musical skills			0.403
22	I practice in order to achieve high ratings (e.g., grades) and positive feedback			0.325

External Resources [Levene, (4, 294) = 1.554, $p = 0.187$]. The descriptive statistics for all groups and dimensions are set out in Supplementary Table S6 in the Appendix.

The ANOVA results demonstrate significant differences with small size effects between the groups in Practice Organization [F (4, 294) = 3.818, $p = 0.005$, $\omega^2 = 0.04$]. Specifically, there are differences in the mean scores between musicians who practice less than 1 h per day ($M = 28.55$, SD = 6.05) and those who practice more than 4 h per day ($M = 32.77$, SD = 5.69) as well as between participants practicing between 1 and 2 h per day ($M = 29.17$, SD = 6.26) and those practicing more than 4 h per day (M = 32.77, SD = 5.69).

Regarding the External Resources dimension, there are medium size effect differences (F(4, 294) = 7.608, $p < 0.001$, $\omega^2 = 0.08$). These differences emerge when comparing musicians who practice less than 1 h per day ($M = 17.09$, SD = 3.49) with those who practice within the range of 2 to 3 h ($M = 19.44$, SD = 3.34) and between 3 and 4 h ($M = 20.14$, SD = 2.70), as well as with participants practicing over 4 h per day ($M = 19.60$, SD = 2.52). Additionally, the results also detail differences between participants practicing between 1 and 2 h per day ($M = 18.55$, SD = 3.03) and those practicing for between 3 and 4 h per day ($M = 20.14$, SD = 2.70). Supplementary Table S7 describes the post-hoc tests deploying Bonferroni correction and CI through Bootstrapping.

3.2.5 Quantity of practice: practice days per week

All dimensions display homogeneity of variance: Practice Organization [Levene, (3, 295) = 0.324, $p = 0.808$]; Personal Resources [Levene, (3, 293) = 2.465, $p = 0.062$]; External Resources [Levene, (3, 295) = 0.254, $p = 0.859$] with the complete descriptive statistics set out in Supplementary Table S8 (see Appendix).

The ANOVA results point to small effect differences in the Practice Organization dimension [F(3, 295) = 6.157, $p < 0.001$, $\omega^2 = 0.049$]. In particular, there are significant differences between the categories of musicians who practice between 1 and 2 days per week ($M = 26.88$, SD = 6.51) and musicians who practice between 5 and 6 days per week ($M = 30.83$, SD = 5.74) as well as musicians practicing daily ($M = 31.35$, SD = 5.39).

In the External Resources dimension [F (3, 295) = 9.810, $p < 0.001$, ω2 = 0.081], there are significant medium size differences between musicians practicing between 1 and 2 days per week ($M = 16.95$, SD = 3.08) and musicians practicing between 5 and 6 days per week ($M = 19.28$, SD = 3.04) as well as musicians practicing daily ($M = 20.05$, SD = 3.37). Differences also appear between musicians practicing between 3 and 4 days per week ($M = 18.47$, SD = 2.82) and their peers practicing daily ($M = 20.05$, SD = 3.37). These post-hoc tests appear in Supplementary Table S9.

3.2.6 Expertise

After excluding the possibility of non-homogeneity of variance across all dimensions [Practice Organization: Levene (2, 296) = 0.412, $p = 0.663$; Personal Resources: Levene (2, 294) = 0.186, $p = 0.831$; External Resources: Levene (2, 296) = 1.225 $p = 0.295$], we conducted a one-way ANOVA test to examine the differences between levels of expertise. The corresponding descriptive results are available in Supplementary Table S10.

The ANOVA results reveal significant differences with a small size effect in the Personal Resources Dimension [F(2, 294) = 5.659,

$p = 0.004$; $\omega^2 = 0.030$] between the Pre-Professionals ($M = 27.65$; SD = 3.62) and the Professionals ($M = 29.36$; SD = 3.87). In terms of the External Resources dimension, the results convey significant differences with small size effects [$F(2, 296) = 8.085$, $p < 0.001$; $\omega^2 = 0.045$] between Students ($M = 20.21$; SD = 3.31) and Professionals ($M = 18.35$; SD = 2.98). Supplementary Table S11 (in the Appendix) details the post-hoc tests for this variable.

3.2.7 Age

Levene's test confirms the homogeneity of variance across every dimension [Practice Organization: Levene (2, 296) = 2.475, $p = 0.086$; Personal Resources: Levene (2, 294) = 1.319, $p = 0.269$; External Resources: Levene (2, 296) = 0.232 $p = 0.793$] with the descriptive results provided in Supplementary Table S12 (Appendix).

The ANOVA results report small size differences in the Practice Organization dimension [F(2, 296) = 3.697; $p = 0.26$; $\omega^2 = 0.018$] between participants aged 26 to 35 years ($M = 29.03$, SD = 6.48) and those aged 36 years or older ($M = 31.27$, SD = 5.84). The Personal Resources dimension returned differences with a medium size effect [F (2, 294) = 12.333, p < 0.001; $\omega^2 = 0.071$] between musicians aged 18 to 25 years ($M = 27.88$, SD = 4.00) and those aged 36 years or older ($M = 30.24$, SD = 3.20), as well as between participants aged 26 to 35 years ($M = 27.95$, SD = 4.09) and those aged 36 years or older ($M = 30.24$, SD = 3.20). The External Resources dimension displays differences with a medium size effect between participants [F (2, 296) = 12.690, p < 0.001; $\omega^2 = 0.073$] aged 18 to 25 years ($M = 20.28$, SD = 2.89) and those aged 36 years or older ($M = 18.21$, SD = 3.12). Supplementary Table S13 presents the post-hoc tests.

3.2.8 Time since the first public performance

Levene's test results convey a homogeneity of variance in each of the three factors [Practice Organization: Levene (2, 296) = 0.030, $p = 0.970$; Personal Resources: Levene (2, 294) = 1.618, $p = 0.200$; External Resources: Levene (2, 296) = 0.319, $p = 0.727$]. These descriptive results are available in Supplementary Table S14 (Appendix).

The ANOVA results display medium sized differences in the Personal Resources dimension [F (2, 294) = 10.412, $p < 0.001$; $\omega^2 = 0.060$] between the "1 to 9 years" group ($M = 26.75$; SD = 4.47) and the "10 to 29 years" group ($M = 28.74$; SD = 3.78); between the "1 to 9 years" group and the "30 years or more" group ($M = 30.18$; SD = 3.29); and between the "10 to 29 years" group and the "30 years or more" group. In the External Resources dimension, we may report medium sized differences [F (2, 296) = 10.547, $p < 0.001$; $\omega^2 = 0.060$] between the "1 to 9 years" category ($M = 20.73$; SD = 2.88) and the "10 to 29 years" category ($M = 18.83$; SD = 3.15); and between the "1 to 9 years" category and the "30 years or more" category ($M = 17.98$; SD = 3.23). The complete post-hoc tests may be found in Supplementary Table S15 (Appendix).

3.3 Relationships between variables

3.3.1 Practice hours per day X expertise

We then carried out a chi-square test of independence (3×5) to investigate the relationship between hours of study and participant expertise levels (student, pre-professional, and professional). The results identify a significant association between practice hours and expertise [$\chi^2(8) = 16.812$, $p = 0.032$, Cramer's V = 0.16]. Analyses of the adjusted standardized residuals demonstrate that the student category statistically associated with more hours of study (1 to 2 h and 3 to 4 h of study per day). On the other hand, professionals were statistically associated with fewer hours of study (up to 1 h of study per day). Pre-professional participants did not show a significant relationship with any of the practice time categories. Supplementary Table S16 presents these estimates (see Appendix).

4 Discussion

This study set out to investigate the differences in the SRL scores achieved by advanced musicians according to age, gender, nationality, musical instrument, quantity of practice, expertise and quantity of professional experience. As described above, 300 participants completed a survey with the resulting data analyzed through parametric statistical tests. The findings report no statistically significant differences among the categories of gender, nationality and musical instrument. These results are consistent with those obtained in the first application of the same instrument (Araújo, 2016). Other studies of a similar design and sample, produced by Bonneville-Roussy and Bouffard (2015), Liu (2023a), Nusseck and Spahn (2021), and Topoğlu and Topoğlu (2018), also failed to encounter any gender differences.

Similar to our study, Nielsen (2004) reports no significant differences between instrument categories. In Liu's (2023a) survey, brass players reported employing more learning strategies than keyboard players. In our study, woodwind and brass players were included in the same category due to the small sample size. Our results may not point out any significant differences existing as almost half of our sample were plucked string players.

The quantity of practice was measured according to two variables: the number of practice hours per day, and the practice days per week. Regarding the Practice Organization dimension, musicians that declared practicing more hours per day and more days per week obtained higher scores. In the Personal Resources dimension, there are no differences between the SRL scores and the categories of quantity of practice similar to the first application of this scale by Araújo (2016). However, the results for the External Resources dimension did contrast: while musicians who practiced for more than 4 h a day registered lower scores in this dimension (in comparison to participants who practiced between 3 and 4 h), and those who practiced every day of the week reported increased scores (in comparison with participants who practiced less days per week).

The literature has explored the correlation between the quantity of practice time and the self-regulatory behaviors exhibited by advanced musicians. Previous descriptive-correlational studies by Miksza and Tan (2015), Topoğlu and Topoğlu (2018), and Ritchie and Williamon (2013), as well as observational studies by Boon (2020) and the microanalysis study by Miksza et al. (2018), which measured the quantity of practice hours per day, also found that a greater number of practice hours corresponds to higher SRL scores.

However, when relating the quantity of practice hours per day to the expertise variable, the chi-square test of independence (3×5) here demonstrates that students were associated with more hours of practice per day than professionals. Furthermore, professionals were statistically associated with fewer hours of practice (up to 1 h of practice per day). Pre-professional participants did not show a significant relationship with any of the practice time categories.

These results are similar to those of Bonneville-Roussy and Bouffard (2015), Araújo (2016), and Dos Santos and Gerling (2011),

suggesting that, as musicians gain more experience, their practice becomes more self-regulated, thereby reducing the practice time necessary to achieving goals. While musicians who practice for extended periods report greater recourse to SRL processes, more experienced musicians claim to practice for less time. Students, who spend more time in the practice room, may simply have more information to report about their strategies. By contrast, professional musicians may spend more time in activities such as rehearsals, performances or teaching (Vellacott and Ballantyne, 2022). Thus, self-regulation eventually serves as a determining factor for individuals to be able to sustain their artistic activities. Studies that measure SRL and time management in advanced musicians portray improvements in time management and enhanced practice efficiency as the main outcomes (Kim, 2010; Clark and Williamon, 2011; Miksza, 2015; Pike, 2017; López-Íñiguez and McPherson, 2020).

The Expertise variable categorized participants into Students, Pre-Professionals, and Professionals. ANOVA analysis identifies significant differences in the Personal Resources dimension, with Professionals obtaining higher scores than Pre-professionals. On the other hand, in the External Resources dimension, Students scored higher than Professionals.

The same differences emerged when musicians were asked to report the number of years since their first public performance. Musicians reporting more years since their first public performance scored higher in the Personal Resources dimension and lower in the External Resources dimension. Similarly, in terms of age, older musicians scored higher in the Personal Resources dimension and lower in the External Resources dimension. Bonneville-Roussy and Bouffard (2015) describe how older participants deploy deliberate practice strategies more frequently than younger participants. These findings suggest that, as musicians gain in experience, their metacognitive processes become more relevant than the social factors of their performance.

The items included in the External Resources dimension encompass processes such as seeking help from others (teachers, peers, composers, musicologists, and specialists) as well as actively searching for other sources of information able to support daily practice, such as books, recordings, videos, the Internet, and social media. In the 2002 article by McPherson and Zimmerman, the first to adapt Zimmerman's cyclical model to music learning, the authors state they did not find any mention of seeking external resources in the literature on musical practice (McPherson and Zimmerman, 2002). Two decades later, music practice research has advanced (How et al., 2022) and therefore enables discussion of these results. Over the years, other studies have reported that professional musicians rely less on external assistance when preparing for performances, in comparison with students, even among advanced musicians from diverse cultural backgrounds who not only received different musical education but also face different job markets (Nielsen, 2004; Dos Santos and Gerling, 2011; Araújo, 2016; Volioti and Williamon, 2017).

On the other hand, when approaching undergraduate students, studies examining the practices of pre-service music teachers obtain results that portray how more advanced students on this study program employ more help-seeking processes than their peers during the early years of the program (Boon, 2020; Kaleli, 2021). Similarly, microanalysis studies register the greater use of external resources among undergraduate participants with higher music performance scores (Miksza et al., 2018; McPherson et al., 2019; Osborne et al., 2021). This suggests that, even though professionals report minimal usage of strategies related to social factors, this behavior is adopted by students with higher levels of performance evaluation in keeping with how aspiring musicians can benefit from seeking external resources during their practice sessions. This proactive behavior enables them to engage in "modeling, listening, and critical appraisal" (Ritchie and Williamon, 2013) and engage in positive reinforcement through exchanging knowledge with peers (Dos Santos Silva et al., 2023; Liu, 2023b), which are crucial for their growth and attainment of performance excellence, particularly during the learning phase.

The results of this study should be considered in light of its limitations. The sample consisted of volunteers, which may affect the generalizability of the findings and may not fully encompass the variety existing in the population studied. Nevertheless, data anonymity may have mitigated potential sample bias.

Furthermore, SRL processes in descriptive research may reach a broader population but may not accurately reflect actual practice behaviors. Recent studies employing the same questionnaire in structured interviews have indicated that conceptions of SRL processes, such as goal-setting and environment structuring, diverge considerably among advanced musicians (Silva and Fiorini, 2021). Other studies have combined quantitative scales with the observation of SRL processes as they occur, for example in microanalysis studies (Miksza et al., 2018; McPherson et al., 2019; Osborne et al., 2021). Future research might combine large sample surveys with observation applied to a sample subset. Moreover, follow-up studies using quantitative scales could efficiently measure the maintenance of SRL behaviors learned through intervention over time.

5 Conclusion

The purpose of our study was to evaluate the reliability of a self-regulation measurement scale in Portuguese. Additionally, we sought to gather current information about the practice habits of advanced musicians who study and work in two Portuguese-speaking countries. Our two first hypotheses were confirmed: the EFA results organized the same items into the three dimensions as Araújo (2016) first study, suggesting that the questionnaire is robust for assessing SRL processes. We may also report that there were no significant differences in SRL scores based on gender, nationality or musical instrument. Participants who declared practicing for more time scored higher in the Practice Organization dimension across both variables (hours per day and days per week). In the External Resources dimension, musicians who declared practicing every day of the week scored higher (than all the other categories). However, participants who reported practicing more hours per day then scored lower in this dimension, and that partially confirms hypothesis 3. Lastly, the fourth hypothesis was also partially confirmed. More experienced musicians scored higher in the Personal Resources dimension but lower in the External Resources dimension, based on expertise, age, and years since their first public performance.

The results of this research suggest that SRL constitutes a set of processes that musicians acquire throughout their learning journey and that these interlink with a significant amount of practice time. As these processes become internalized, practicing becomes more efficient and the time required to achieve performance goals decreases. Similarly, the search for assistance and external resources is an expected behavior in the professional development of musicians. As they attain higher levels of professional performance, personal resources surpass their recourse to external factors.

Developing and validating questionnaires tailored to the specificities of music practice should be encouraged as this may improve music teacher diagnosis of just which SRL dimensions their students need to consider most as well as keeping track of positive changes in SRL behaviors. In the present study, we provided psychometric evidences to this instrument; therefore, new studies should be conducted to establish norms that will be used to contextualize individual scores on this test. Future studies may use the questionnaire to collect empirical results and compare scores with new samples in the context of Brazil and Portugal, concerning the total table.

In small samples, from which data may not be generalized, the questionnaire is especially helpful as it may encourage advanced students to stop and reflect on their practice habits (Silva and Fiorini, 2021). Furthermore, future research might further assess the consistency of this SRL measuring scale for the learning processes undertaken by beginner and intermediate musicians.

Data availability statement

The datasets presented in this article are not readily available because the raw data supporting the conclusions of this article will be available after the full research is completed. Requests to access the datasets should be directed to camillasilvamusica@gmail.com.

Ethics statement

The studies involving humans were approved by UNICAMP–PRÓ-REITORIA DE PESQUISA DA UNIVERSIDADE ESTADUAL DE CAMPINAS–Comitê de Ética em Pesquisa em Ciências Humanas–CHS/UNICAMP. CAAE: 09319219.8.0000.8142. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their on-line informed consent to participate in this study.

Author contributions

CS: Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Software, Validation, Writing – original draft, Writing – review & editing, Conceptualization. MA: Conceptualization, Data curation, Investigation, Methodology, Software, Writing – review & editing, Writing – original draft. HM: Funding acquisition, Supervision, Writing – review & editing, Writing – original draft.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This study is part of a larger research funded by the São Paulo Research Foundation (FAPESP), grant #2018/20809-2 and #2019/21481-3 held by CS. Thanks are due to FCT/MCTES for the financial support to INET-md (UIDB/00472/2020), through national funds.

Acknowledgments

The authors thank Dr. Alex França for providing statistical consultation.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2024.1324100/full#supplementary-material

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 02 April 2024
DOI 10.3389/fpsyg.2024.1368074

OPEN ACCESS

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RECEIVED 09 January 2024
ACCEPTED 19 March 2024
PUBLISHED 02 April 2024

CITATION
López-Íñiguez G and McPherson GE (2024) Using a music microanalysis protocol to enhance instrumental practice.
Front. Psychol. 15:1368074.
doi: 10.3389/fpsyg.2024.1368074

Using a music microanalysis protocol to enhance instrumental practice

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The strategies that enable musicians to adapt their behaviors so that they can break through, feel energized, and perform well collectively distinguish what it is to be a self-regulated learner. These strategies range from one's ability to monitor thoughts and actions to being able to navigate and control one's emotions, especially when feeling frustrated or anxious. Given the challenges of the music profession, it becomes imperative for teachers to equip their students with the necessary skills to self-regulate their own actions, feelings, and thinking so that they are eventually able to cope with the demands required of a contemporary professional musical career. In this study, we focused on the self-regulatory engagement of four master's level cellists who were enrolled in a prominent European higher music education institution. Our data comprised self-regulated learning-based diary-reports that describes the students' practice of self-chosen, especially demanding passages as they prepared for a public recital. Results depict differences between the musicians according to the efficiency of their practice leading up to a formal public recital.

KEYWORDS

metacognition, microanalysis, musical development, motivation, self-regulated learning, musical practice, higher music education, professional education

1 Introduction

Developing autonomy and control of one own's practicing routines and learning strategies is a never-ending quest for performing musicians. A progressive and time-intense practicing process starts at an early age and becomes more important as a developing musician learns to take charge and self-regulate their behavior. Practice autonomy is crucial when musicians transition from higher education to the music profession—an ever-changing, artistically creative, and economically challenging arena. Under such circumstances, one might assume that music graduates would be prepared to step into the industry reality and take charge by themselves, especially in terms of knowing how to practice their instrument and being autonomous in their artistic decisions and strategic learning (McPherson, 2022; Zachariou and Bonneville-Roussy, 2024). An ideal scenario, given today's imperatives of being a professional musician, would be that young musicians enter the profession sufficiently prepared to take on their roles in the vast number of possible employment scenarios within the music profession that are available to them without the ongoing need to rely on the support of a teacher or institution.

The centuries-long conservatoire tradition—based on the master-apprentice model—does not always help to build the required autonomy to learn new and old repertoire (Gaunt et al., 2021; Pozo et al., 2022). Instrumental and vocal students spend a large part of their lives

listening to the advice and observing the playing of their teachers in one-on-one lessons—and that of experts in masterclasses or competitions. This includes explanations and demonstrations on *how* to practice, as well as modeling of the *in which* ways to practice. As a result, many music students remain dependent on their professional mentors' feedback and advice till the end of (and sometimes beyond) their professional studies. Considering the crude neoliberal reality of modern-day performing music careers—where creativity, innovation and autonomy are key elements of flourishing—this pedagogical approach seems inadequate and inefficient (Evans and Ryan, 2022).

Given the challenges of the music profession, it becomes imperative for higher music education—and, generally, for liberal arts universities—to embrace the responsibility and leadership required to equip performing students with the necessary skills to flourish personally and professionally as well-rounded musicians (e.g., López-Íñiguez and Bennett, 2020; Palmer and Baker, 2021). For decades, educational social psychology research has acknowledged that one approach for achieving this includes fostering students' metacognitive engagement with their learning by teaching them how to take charge of their learning (McPherson and Hattie, 2022; Pozo et al., 2022). In short, great teachers encourage their students to self-regulate their actions, feelings, and thinking by helping them become progressively more autonomous and independent so that they are eventually able to cope with the demands required of a contemporary professional musical career (McPherson and Hattie, 2022).

2 Theoretical framework

2.1 Self-regulated learning and professional music performance

Research shows that more proficient and resilient musicians have developed a range of organizational competencies and skills that they draw upon when preparing for a challenging performance (Pecen et al., 2018). The 'toolkit' of strategies that enable musicians to adapt their behaviors so that they can break through, feel energized, and perform well collectively distinguish what it is to be a self-regulated learner (McPherson, 2022). These strategies range from the ability to monitor one's own thoughts (cognition) and actions (behavior) to being able to navigate and control your own emotions (affect), especially when feeling frustrated or anxious (McPherson and Zimmerman, 2011; McPherson, 2022). The process of triangulating these three basic and interrelated human capacities equips music professionals with the toolkit of skills needed for them to develop their own distinctive "learner identity" that will subsequently support them throughout their professional lives (e.g., López-Íñiguez and Bennett, 2021). As McPherson (2022) states, "becoming self-regulated in the mastery of music involves being able to recognize a challenge, understand the scope and nature of this challenge, focusing your motivation to deal with the challenges, enacting strategies and plans to overcome the challenge, and evaluating your progress toward overcoming the challenge" (p. 556).

The above processes are integral to the development of musical expertise (Zimmerman and Moylan, 2009; McPherson et al., 2017; McPherson, 2022). Indeed, in recent years, music research has attended to help graduate music students (e.g., Jabusch, 2016; Antonini Philippe et al., 2020; Rodríguez-Cortés and Casas-Mas, 2023) as well as professional musicians (e.g., López-Íñiguez and McPherson, 2020, 2021) to elicit their general preparation for performance with the aim of improving their self-regulatory skills. Drawing on work by Zimmerman (2002), these studies include efforts to adapt and refine existing self-regulation questionnaires and rubrics from general learning domains that serve diverse purposes in helping people to manage their learning, motivations, and emotions in a more agentic way. Another step forward in supporting learners of different ability to proactively engage with self-regulation, has been the development of a technique known as *microanalysis*, which supports learners in establishing and assessing specific learning goals and strategies to manage their learning in a variety of contexts (Cleary and Callan, 2018), including music (e.g., McPherson, 2022).

2.2 Microanalysis of self-regulated learning in music

Self-regulated learning microanalysis is a helpful technique to examine how learners engage in authentic learning and performance activities according to the cyclical phases and sub-processes of the model depicted in Figure 1. This technique helps to assess how learners in any field of domain apply, monitor, and adapt strategies and actions to improve their own actions, cognition, and affect when learning anything in a specific moment (Cleary and Callan, 2018; in music, McPherson, 2022). The technique is structured by (1) Selecting a well-defined task; (2) Identifying target processes that need most attention; (3) Developing self-regulated learning microanalytic strategies that align to the specific self-regulated learning technique that is being targeted; (4) Linking cyclical phase processes (before, during, after) to task sub-process (behavior, cognition, affect); and (5) Evaluating and planning for the next attempt, practice session, or performance (Cleary et al., 2012).

Over the past decade, a music microanalysis technique has been developed by Author 2 and his colleagues (McPherson et al., 2015; Osborne et al., 2021) for use by musicians of various abilities. The "Optimal Music Practice Protocol" (OMMP) they developed is based on the three-phase model of self-regulated learning (i.e., forethought, performance, and self-reflection) shown in Figure 1, with the expressed aim of cuing "students to describe their actions and then reflect critically on the strategies they choose to improve their playing *in-situ*." (McPherson et al., 2019, p. 19). Most of the research using the OMMP has focused on the practice habits of undergraduate piano performance majors who rely heavily on their teachers' feedback to prepare challenging repertoire for their end of semester recital examinations. To date, there have been no research studies using the microanalysis technique with musicians during the transition stage from higher education to music careers when no teacher feedback is available to them, and when they are preparing to play profiled concerts rather than exam recitals.

3 Aims of the research

With the above in mind, this study focuses on the self-regulatory engagement of four highly skillful (i.e., invested in their studies, giving regular trial performances, having been accepted to a highly competitive study program) classical music performance students enrolled in a prominent European higher music education institution. We followed

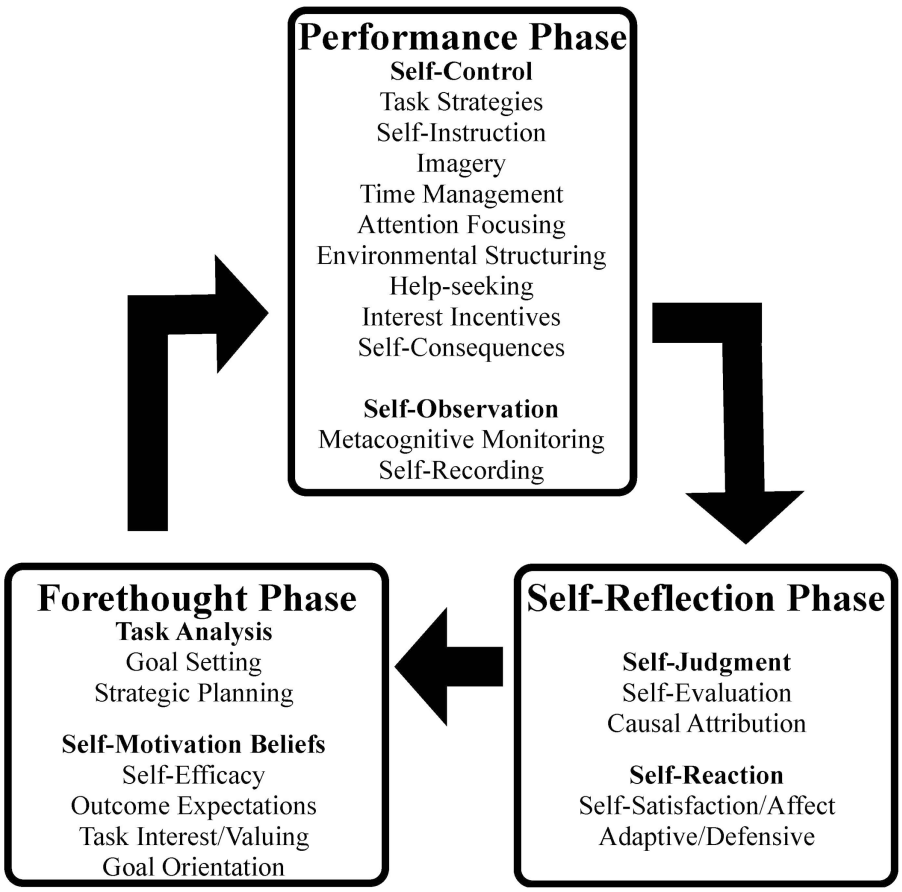

FIGURE 1
Phases and sub-processes of self-regulated learning in music. Reprinted with permission from McPherson ((2022), p. 555).

their self-directed practice across a semester-long process of preparations for their own virtuoso classical-romantic repertoire recitals at profiled concerts. Our data comprised self-regulated learning-based diary-reports that described the students' practice of self-chosen "specially demanding" passages. The following questions guided our research:

- What sub-processes of self-regulated learning (as shown in Figure 1, and described in the OMMP), did the musicians use to evaluate the quality of their practice sessions, and how might these be different across the four musicians in relation to their own progress and their chosen repertoires? (i.e., non-comparative study).
- In what ways, if any, did the use of the OMMP self-regulated learning microanalysis technique help the musicians improve their performance of challenging passages of virtuoso repertoires when independently preparing for public concerts at profiled venues?

4 Method

4.1 Sample

Participants included four high ability performing cellists enrolled in official graduate programs at an elite European higher music education institution. At the time of data collection, all were combining the final year of their master's degree in musical performance with remunerated professional performing activities. These participants—who were transitioning from higher music education to the music industry—were born in the early 1990s. All four musicians were completing a master's degree in cello performance and had considerable performance experience in professional chamber and orchestral settings. They had also completed their undergraduate degrees and progressed directly to the master's degree. To ensure maximum variety between them (Stake, 2005), the participants comprised two local and two international master's students. To ensure the anonymity of participants, their names have been changed (see Table 1).

4.2 Materials and procedure

This is a qualitative, purposeful multiple-case study (e.g., Yin, 2017) that involves a pedagogical intervention of self-regulation with four cellists. It is a non-comparative study that includes replications across the four cases to investigate the levels of sophistication of their use of self-regulated learning strategies across three practice sessions as they prepare unknown virtuoso repertoires for a profiled concert (see next section for details).

TABLE 1 Demographics of participants.

	Olga	Lukas	Xie	William
Birth year	1993	1991	1993	1990
Gender	Female	Male	Female	Male
Degree	Master's	Master's	Master's	Master's

TABLE 2 Phases of the study.

Phase 1	Phase 2	Phase 3
• Selecting the repertoire. • Pilot concert (videorecorded). • Interview to select the most challenging passages.	• 3x study sessions (videorecorded). • Applying the Optimal Music Practice Protocol *in-situ*.	• Public concert (videorecorded). • Interview to analyze the effectiveness of the intervention.

The participants were accessed via an open invitation to participate in the study, sent by the Head of the Department in charge, and they were offered study credits for their participation. To ensure this was a project-based learning to foster students' autonomy, the participants agreed on the following aspects prior to the commencement of the study:

1 Choosing a recital repertoire that included pieces that were unfamiliar for them.
2 Reading sources connected to the repertoire that they thought could inform their artistic work (e.g., biographical, musicological).
3 Not bringing this repertoire to their regular cello lessons or to master classes.
4 Not listening to existing audio–/video-recordings of this repertoire.
5 Not attending live concerts where this repertoire was performed.

The reasons we chose to restrict the participants from listening to existing recordings of their chosen repertoires, or to prepare their recitals with other performing experts was twofold. First, in contrast to the practice of professional musicians, music students tend to rely more heavily on external regulators to inform their practice in the very early stages of learning (e.g., Volioti and Williamon, 2016); and second, when graduate musicians premiere contemporary repertoire, they typically do not have recordings, recent performances, or *status quo* performance advice available to them. Thus, the focus of the study was to delve into the students' ability to self-regulate their preparation for their recital entirely by themselves, and to minimize any forms of external regulation that might impact on the choice of self-regulatory processes they employed for mastering the repertoire to be performed at a public event. We saw this as a first step for subsequently expanding the parameters of the current study for use with larger samples of students in which the microanalysis technique can be compared with other forms of practicing that include various forms of self and external regulation.

The study had three phases (see Table 2). In phase 1, the participants selected repertoire that was unfamiliar to them, based on an exhaustive list comprising all cello and piano sonatas from the classical to the early romantic periods. Participants were free to choose their own repertoires according to their interests. The reason for this was that we wanted the participants to be motivated and satisfied about their choices, and to be able to play the repertoire they selected in other contexts after the study, particularly given that the process involved many hours of dedicated practice during various stages across the semester. Furthermore, interest and motivation has been linked to higher self-regulation in musicians (e.g., Miksza, 2006; Evans, 2023). Regarding the selected repertoires, Liebmann (1806); Beethoven (1815); Smyth (1887); Martucci (1880) and Herzogenberg (1886). All participants then practiced on their own and with their pianists for 6 months, before giving a preparatory concert that was performed in front of the first author. This concert was videorecorded, and subsequently, the participants watched their own performances and were interviewed by the first author, to identify and select specific passages that they found challenging and that they would like to improve through their participation in this intervention.

In phase 2, participants received an adapted version of the "Optimal Music Practice Protocol" (OMMP; McPherson et al., 2015, 2019; Osborne et al., 2021). The microanalysis protocol was administered across 3 stages of practice (before, during, after) in each practice session, where the participants focused exclusively on the challenging passages they had selected to master. The OMMP is useful for undertaking a self-analysis of what participants planned in preparation to their practice, what they did/thought/felt during the actual practice, and how they assess the practice session immediately after it had concluded as well as after watching a videotape of the practice. The OMMP booklet includes Likert scale items as well as open-ended questions and can be accessed via the link in the Supplementary material section of this article.

Within phase 2, musicians responded to the first section of the OMMP diary, that was completed before each practice session, and included questions about the tasks (i.e., goal setting, strategic planning) and self-motivation beliefs of these musicians (i.e., self-efficacy, outcome expectancies, task interest, and task value). The second section was carried out during their practice, where they reflected on issues of self-control (e.g., maintenance of concentration and interest, tactics used, structuring of environment) and self-observation (e.g., self-talk during problem solving, keeping record of progress). Finally, the participants provided responses to the third section, after watching a videorecording of their practice, where they made self-judgments on (1) the effectiveness of the practice, (2) their causal attributions for the quality of their practice, and (3) their affect and overall feeling of achievement.

In phase 3, participants played a public concert at a profiled venue, which was also video recorded. After the concert, the participants

watched the recording and were interviewed to assess the effectivity of the intervention on the outcome of the challenging passages they had identified and worked on with the aid of the OMMP. All interviews were transcribed verbatim for data analysis.

4.3 Ethics

Ethical approvals were obtained prior to the study from the Research Ethics Committee at the university where the study took place. Students signed consent forms following the guidelines of the local Advisory Board on Research Integrity, and students were not obliged to participate.

4.4 Analysis

For this study, we applied the self-regulated learning microanalysis technique to analyze the learning strategies participants used before, during, and after each practice session, in connection to the challenging passages of classical-romantic repertoires, and whether they became more complex across sessions. We employed a self-regulation-grounded thematic analysis of the behavior, affect, and cognition the participants reported to improve their learning and performance of the selected passages, as well as their self-rating of improvement across sessions. During the deductive analysis, we read through the dataset multiple times, looking for meaningful themes (e.g., Braun and Clarke, 2012). As this is a multiple-case study, a summary of each individual case, from less to more sophisticated, is reported in the next section. In line with Yin (2017), this is followed by cross-case conclusions.

5 Findings

In the following sections we summarize how each of these musicians worked on the repertoire set for this study, using the OMMP to cue and guide their musical practice and preparation for their recitals. Each comment by the musicians includes a comment in brackets that identifies the self-regulated learning sub-processes shown in Figure 1, for which the comment aligns.

5.1 Olga

5.1.1 Forethought phase

Olga chose the cello entrance of the first movement (Allegro) from Hélène Liebmann's *Grande Sonata for Cello and Piano* (1806) and spent 10, then 17 and then 11 min for each of the three sessions working on this passage. She chose this section of the piece because she was not satisfied with the intonation in the "leap to B flat which should not have been that bad" and "the quality of the sound when there is a string crossing and a position change at the same time" (Strategic Planning). Olga also acknowledged that she "simply could not play [this passage] that well technically" as she was "not so well prepared" (Self-Efficacy). She recognized that it is important "not to rely on luck when my mind tells me I am going to fail" (Outcome Expectations). To solve these issues, Olga thought it would be a good idea to develop "a better contact of the bow hair on the strings" (Strategic Planning), however, she did "not know how to practice [the bow crossing] or how to find confidence in myself to do that" (Self-Efficacy). She also wanted to have "more fireworks and playing it in a more interesting way, to engage the audience more" when interpreting the music (Goal Setting).

Olga started each session by playing the passage through to "figure out what to do" and assess the "situation" (Goal Setting). Her goals before each practice session remained similar, with a strong focus on staying calm "to control everything that was happening" (Goal Orientation), especially being "bow-mindful" to anticipate bow squeaks in string crossing or "practicing slowly and being aware of the intonation by listening carefully" during left hand position shifts (Strategic Planning). Other aspects that she considered included a "lightness in the phrasing and a good sound blend when playing with the pianist" (Goal Orientation). Although she acknowledged that she had "not learnt any new strategies for working on this passage," her confidence about her self-chosen goals and strategies (e.g., bow control, shifts in relation to intonation), as well as her competence to master them was strong (Self-Efficacy). The reasons for choosing these goals and strategies included achieving "a personal best, so that I'm not embarrassed and do not put others down, especially the pianist" (Goal Setting), as well as "avoiding forgetting what I have learnt" (Strategic Planning).

5.1.2 Performance phase

While practicing during the first two sessions, Olga felt defenseless as she could not "improve or achieve anything anymore!" (Self-Consequences; Attention Focusing). She "hate[d] the feeling of recording myself as it made me shocked about the passage, whereas the pleasant music makes me feel neutral" (Self-Recording; Metacognitive Monitoring). Olga stressed however, the importance of "progressively normaliz[ing] the feelings about this passage and recording it" (Self-Recording), although in the last session, she felt "funny to succeed in front of the camera as I was just lucky, while disappointed and frustrated because I am not a perfect machine, obsessed with this [passage]" (Self-Monitoring). Olga also acknowledged that drinking coffee before practicing made her "extremely anxious" (Environmental Structuring). Overall, Olga thought "about new musical things in phrasing"; having "thoughts on improving little things through the influence of historically informed performance practice" (Help-Seeking). She consciously tried to develop a "technical control for bow squeaks, accentuation and articulation" (Self-Instruction), as well as improving the "intonation using double stops as cues [and being more aware of] the differences between B flat and sharp when comparing them to Baroque tunings" (Attention Focusing). She wanted to become "more fluent musically using direction in micro phrases, [adding] clear mordents and more ornaments for phrasing, and vibrato" (Task Strategies).

5.1.3 Self-reflection phase

After each practicing session, Olga consistently reported an improvement in her concentration because "the [OMMP] tool is really useful in helping me to focus better" (Casual Attribution). She reported that this type of practice preparation and microanalysis had helped "especially this time in my life, when I have so little time and so much music to be performed" (Adaptive). Furthermore, she understood "how important this kind of practicing is and how it helps

the final outcome; I did not understand it instantly I must say, but I definitely try to focus better from now on certain tasks" (Self-Evaluation; Adaptive). Although her sense of strategy effectivity and goal achievement after sessions was not strong, she had "not master the passage sufficiently" (Self-Evaluation), and she was initially reluctant to "work on the passage or think about it in terms of strategies" (Defensive). She did, however, acknowledge that being more aware of her goals and strategies helped in developing "more quality in the sound, intonation, and phrasing" (Self-Evaluation; Causal Attribution). During the actual concert, she reported "feeling a bit nervous, indifferent, and insecure" (Self-Evaluation), and although she "felt embarrassed [because] I nevertheless failed with some other passages" (Self-Evaluation), the passage she had practiced with the OMMP tool "came out the best; I was more courageous and had a better flow, and I was thinking, oh, it is better in tune than I thought" (Self-Satisfaction).

5.2 Lukas

5.2.1 Forethought phase

Lukas chose bars 157–182 and 217 to the end of the last movement (Allegro Vivace) from Ludwig van Beethoven's *Cello Sonata in C Major no.4, op. 102* (1815). He spent less than 10 min per session to work on these passages. Lukas identified a few blind spots he wanted to improve, acknowledging that many of them he did not realize during the pilot concert, but only after watching the video, which he considered "an eye-opening activity" (Task Interest/Valuing). He wanted to work on this passage because there were "sudden moments where we were not being completely together with the pianist" (Goal Setting) because "when you play them on your own, they are fine, but then in the concert everything is not like 100%" (Self-Efficacy; Goal Orientation). He also mentioned that "the intonation and the dynamics [of the selected passage] were not so spot on [even if these were the ones] I had worked most on, [but clearly] with not so successful strategies" (Strategic Planning).

For Lukas, his goals remained similar across the practice session, as he was consistently looking to "play the passage right while adjusting to the piano phrasing and the dynamics" (Goal Orientation). He also wanted to work on the "intonation in relation to position shifts and changes while being relaxed, for which he decided to make "rhythmic variations with 16th notes" and "playing around with the passage by using different positions and fingerings, sudden changes in sound quality" (Strategic Planning). To achieve these goals, Lukas' strategies before practicing included "reading the score and visualizing it internally, focusing on its symbols" (Strategic Planning), using "[a long note played by] the tuning machine for guiding intonation while playing the passage slowly" (Strategic Planning), as well as focusing on "playing dynamics carefully and slowly, [working on] position changes through specific intervals and changing across strings more carefully [while playing at a] slow tempo [to assess] where is the weak spot in the shifts" (Strategic Planning). Lukas' confidence in achieving and mastering these goals, as well as his personal interest and value in the longer term for carrying them out were rather high during the first two sessions, whereas they all dropped in his last practice, as he acknowledged experiencing a certain "lack of energy [and] pressure to work harder as the concert approaches, since I want to succeed" (Self-Efficacy). Like the external reasons that were given by Olga, Lukas explained that he engaged with these goals and strategies because he wanted to achieve his "personal best" (Outcome Expectations) and "[keep improving] while not letting the research, audience, and pianist down" (Outcome Expectations; Self-Efficacy).

5.2.2 Performance phase

Regarding the actual practice sessions, Lukas was especially focused on feeling "the right mood, being focused on my goals and not [getting] too emotional" (Attention Focusing; Metacognitive Monitoring). Indeed, Lukas acknowledged that the longer he practiced, "the more frustrated I felt, [thus needing to] stay neutral and positive" (Self-Instruction). There were recurrent thoughts across the sessions, which included "feeling good to go on as all is going well" and wondering "if there was something that I did wrong, like the hands need to relax a bit more and be better coordinated for the quality of the passage" (Task Strategies, Self-Instruction). There were a variety of strategies he used to improve this passage, like "picking the G note with the tuner and playing the passage on top, to see if I am again wrong" (Task Strategies). He also made "rhythmic variations, being more and more progressive with tempo" (Task Strategies) and worked on "making dynamics clearer by listening to the contrast and thinking about it in relation to the piano balance, but also using bow speed as a new discovery to improve [the dynamic range]" (Task Strategies).

5.2.3 Self-reflection phase

After each practicing session, Lukas mentioned that his concentration, sense of practice efficiency and effectivity of the strategies he chose were "quite good," even if this feeling dropped slightly in the last session (Self-Satisfaction). He also mentioned that he "would not have used so much time and effort to this passage without this [OMMP tool] method, so I'd say it was very useful since I'm happy with the result" (Self-Satisfaction). The use of the microanalysis encouraged him before the concert, as he "felt determined and safe to go and play it, since I know how much time and effort, I have put to practicing this" (Self-Satisfaction). During the interview post-concert, Lukas said he was "happy with the end-result [as] I achieved 95% of what I was aiming at; I especially remember being able to play the dynamics out as well" (Self-Evaluation; Self-Satisfaction).

5.3 Xie

5.3.1 Forethought phase

Xie chose the intermezzo of the 3rd movement (Andantino Falebile), and the scale and finale of the 4th movement (Allegro) from Giuseppe Martucci's *Cello Sonata op. 52 in F-sharp minor* (1880), as well as the pizzicato of the 1st movement (Allegro Moderato) and the beginnings of the 2nd and 3rd movements (Adagio non troppo; Allegro Vivace e grazioso) from Ethel Smyth's Cello Sonata no. 2, op. 5 in A minor (1887). To work on these passages, she spent 21, then 35 and then 77 min for each of the three sessions, without breaks. Xie explained that all these sections presented "intonation issues" during the pilot concert, as well as "issues of acoustic [as] the place where

we were practicing with the pianist before the concert was different, so I need to change some articulations for acoustic reasons" (Strategic Planning). Xie also said that, generally, she had "interpretation shortcomings in these passages" (Outcome Expectations) and would like to get over her "worries and fears [and] give more in the performance while staying calmer physically; otherwise, my hands usually become too stiff and less flexible" (Outcome Expectations, Self-Efficacy). For the Martucci movements, she wanted to specifically work on character aspects and emotional connection with these movements by being "more playful, humorous, and fun, also in my communication with the pianist" (Goal Orientation); whereas for Smyth, she wanted to "connect emotionally with her as a woman composer at that time [since] I was reading about her, and she was lonely and challenged by many people" (Goal Orientation). Xie wanted to achieve her personal best, enjoy the learning process, and reduce the pressure of the concert deadline approaching (Strategic Planning).

Xie also wanted all passages to display "a sound I always have in my mind for colors and expression" (Goal Orientation, Outcome Expectations), for which she would "try several times to get closer to that using a different speed with the vibrato, and working on the bowing quality slowly, and watching the recording of my practice several times" (Strategic Planning). With Martucci in particular, Xie focused on "a big and sudden articulation shift, from staccato to a high position change, so you can be late or out of tune easily" (Strategic Planning), trying to "put all together, finding better intonation, playing it rather slowly, being aware of the left hand before the shifts, and then connecting this to the rest of both movements" (Strategic Planning). For Smyth, she tried to "bring the melody out a bit more, practicing only the upper line while singing internally while I play it softly and make a good phrasing connecting all notes beautifully" (Outcome Expectations). She wanted to bring "the Christmassy feeling of this music through the quality of sound and expressive, not hurrying from pizzicato to bowings, making sure the F sharp in the second chord sounds well, as it is usually covered by the piano" (Outcome Expectations).

For the second practicing session, she planned to "start with the easier parts" and then focus on some sort of "opposite interpretation with fingering changes, color changes" to get inspired by "new ideas" (Strategic Planning, Goal Orientation). Some notes from the previous session needed some "duration corrections" (Goal Setting). Xie also wanted to "improve pianissimo sounds while playing continuous vibrato without breaking the connection between long slurs and obtaining a beautiful legato without slowing down" (Outcome Expectations). In the last practicing session, Xie decided to "set an alarm to accomplish" what she wanted to (Strategic Planning) and to give herself "plenty of time to research and read about this music and the composers, as I am curious between keys and harmony in connection to scales" (Strategic Planning; Goal Orientation). She wanted to "focus on the big picture and how it transfers to different emotions" (Goal Orientation), and she also worked on how to "solve that quarter notes aren't too long [by] playing scales and feeling the gaps of the notes with scales using the Bylsma technique" (Strategic Planning, Goal Orientation).

5.3.2 Performance phase

During the first practice session, Xie worked to "find more interesting spots, and things that are repeated several times, so I use different keys to make it more interesting for me, otherwise I get bored" (Task Strategies). She approached both composers' music using "the metronome for tempo, but thinking in bigger interconnected beats, because in the concert and rehearsals with the pianist, he will do that for me" (Help-Seeking). She also tried "different sounds, doing exaggerations and funny things, and listening to other Martucci works" (Task Strategies). Xie focused on her body, "trying to be relaxed during the shifts, and be confident mentally, trusting myself" (Task Strategies; Attention Focusing). She did try "different options for fingerings and bowings, [leaving] a few options open for the concert, so that it is not fully controlled, allowing for more improvised and fresh feeling during the performance" (Task Strategies). She was generally enjoying her practice as "I love this music and it is mostly expressive" (Self-Instruction; Interest Incentives). Overall, she realized that she needed to "practice with the pianist too, whatever I practice, it needs the bigger context, and to discuss ideas with him, to inform me musically and give me inspiration, I am curious" (Help-Seeking).

Although Xie was "stressed at the end [of the second practice session] due to time constrains" (Time Management), she engaged with "practicing the emotions, while being calm, chill, and focused" (Attention Focusing). She did all "I had planned, providing self-feedback, doing harmonic singing while playing the pizzicati, and separating hands for voice clarity" (Task Strategies). She thought that she needed to be "more structured and strategical when I practice this music again," and she also experienced a certain "self-talk regarding curious musical trials" (Self-Instruction). The past practice session included the alarm set again, which made her feel "nervous." Xie wanted to be more "aware of harmonic details," planning where "to better jump and release to make the music more joyful" (Task Strategies). She was determined to draw connections between the "darkness and heavier f sharp minor scale [that brings me] a feeling of being a performing opera singer" (Imagery). She also worked on the "cello's resonance in the lower register, trying different bow pressures on the string," and thinking of coordinating this "with the pianist, for a clearer articulation and resonance balance" (Task Strategies). Across this last practice session, Xie had a kind of "revelation that there is the same rhythm across pieces (motif) which both composers use in my program. I should have filled in the gap between scales earlier, so good that I noticed this now" (Metacognitive Monitoring).

5.3.3 Self-reflection phase

After every practicing session, Xie noticed a "rather steady and slight improvement in concentration" (Self-Evaluation) and that the selected passages "became better than the ones I did not work with the [OMMP] tool" (Casual Attribution). Overall, she felt that "practices and interviews surprisingly reduced a great amount of stage anxiety and stress before the concert" (Casual Attribution) and that she was "quite relaxed and calm [as] for once, it was a truly wonderful experience that I would never forget—all thanks to those reflections and focused practice" (Casual Attribution; Self-Satisfaction). After the concert, she said that she was "quite happy with the overall result, relaxed, and calm" and that most passages she had practiced "worked quite well" (Self-Satisfaction; Self-Evaluation). Even her friends told her that "it was a great performance and at the same time very me," which made her feel content (Self-Satisfaction). Only minor things disturbed her during the concert, as there "were a few pizzicato places I was maybe trying too hard to bring out the harmony and then I pressed the strings too much and it did not end up sounding exactly like how I wanted [and] the beginning of Smyth sonata in the 3rd

movement that was slightly out of tune" (Casual Attribution). Yet, she realized that "no one was actually paying attention to the mistakes I made during the concert, instead the messages I was trying to deliver were being received successfully so I am very happy about it!" (Self-Satisfaction).

5.4 William

5.4.1 Forethought phase

William chose the second Allegretto and the theme and variations of the final movement (Allegro) from Heinrich von Herzogenberg's *Sonata for Piano and Cello no. 1 in A minor, op*. 52 (1886). He spent 60, then 49 and then 52 min for each of the three sessions, without breaks, to work on these passages. William said that during the pilot concert, he had experienced a "short of nervousness, which is very welcomed in the sense that the next performance will not be the first one anymore" (Goal Orientation). He thought that the selected passages were "a bit underprepared" (Self-Efficacy) as he "had the feeling my musical ideas were not too strong [and that] my phrasing had the opposite effect or not what I tried to do" (Task Interest/Valuing). William acknowledged he did "not know what to do with Herzogenberg's musical material" (Goal Orientation), so he agreed to work on "issues of timing," that the "harmony understanding should not be based on intuition, but on studying the score, that should inform me too" (Strategic Planning), and that "videoing the practicing both with the cello and the piano is priceless, plus lots of singing, as I intend to basically catch the idea from all directions" (Strategic Planning). This would help in "figuring out how to convey my musical ideas for these passages" (Strategic Planning).

The most important goal for William before starting practicing was to "find my own musical voice and not the standard around me, to open up perspectives and ideas and not to have a magical solution, [and to be] less stuck in checking the cello part [and instead] find the freedom by seeing the bigger picture" (Goal Orientation, Outcome Expectations). For this, he decided that the best strategies would be to alternate playing both the cello and piano parts, as well as analyzing the score and singing the music it aloud (Strategic Planning). He also thought it would be good to make "differences in musical surprises when material is repeated across the sections and building it faster until I am pleased with the clarity of nuances" (Strategic Planning). That kind of approach permeated all practicing sessions, but his goals and strategies became more focused toward "harmonic-based phrasing, finding character connections between movements at the emotional level" (Strategic Planning). He also planned to invest some time in "developing overall playing familiarity and reflecting and comparing the growth since I started" (Outcome Expectations). Other strategies he though relevant in the last session included "vibrato exercises, shifts, double stops, and thirds in the upper positions [as well as] deciding on the final fingerings and bowings" (Strategic Planning). William's confidence across sessions regarding these goals and strategies grew progressively (Self-Efficacy), and he wanted to work in that way to "enjoy the process, for my own learning, and to contribute to the research project" (Goal Orientation).

5.4.2 Performance phase

During the first practice session, William "shifted from the piano to the cello, to reading and singing the score" (Task Strategies), something he considered brings "much more awareness of all parts, something [they do not really] teach us at the university." He also "mark[ed] a lot on the score, which I do not do a lot, but helped me musically" (Task Strategies), for instance "[jotting down] the harmonic reduction on the cello score to follow the chord changes" helped Willian "realize that the F sharp in the 5th bar is something harmonically unexpected" or "find the magical moments when there is an odd sequence of chords" (Task Strategies, Imagery). He started making some decisions regarding bowings "in connection to [this passages'] singing qualities and harmony" (Task Strategies), and carefully studied "the headpins, and what the emotional idea of them is" (Imagery). During the second session, William felt "[in a] hurry and busy, but enjoying when feeling the interesting music by Herzogenberg, [with a certain] controversy of feeling satisfied to have time to do this [kind of practice]" (Self-Instruction, Interest Incentives). He started "building connection of phrases to be improved from the last session" (Task Strategies), working with a better focus "on the goals, the melody line of the piano, more singing, playing through" (Task Strategies), and mentioned that "the score analysis [from the previous session] revealed certain natural dramatic emotions" (Task Strategies, Imagery). William also started "waving hands to relax" while seeing the difference between "thought processes versus embodiment" (Attention Focusing). The last session involved a "good physical feeling, [an] enjoyment of flow, [and a] feeling of complete accomplishment for having done a good work, being on top of things" (Self-Instruction, Interest Incentives). He engaged with "warming up, vibrato exercises, shifts and extensions, strings crossing" (Task Strategies), and at the end he "wrote down the final fingerings and bowings" and sang the entire piece "to get into the music mood one last time" (Task Strategies).

5.4.3 Self-reflection phase

After the concert, William realized that "video recording [the practicing sessions] was useful to avoid improvising during the concert" (Casual Attribution) and that "setting goals and strategies in advance and setting time aside to work on the chosen passage helped me focus while practicing" (Self-Evaluation; Casual Attribution). He also acknowledged that "setting myself goals other than instrumentally mastering the passage (harmonic and structural analysis) helped me in developing a very clear thought in how I want to play" (Casual Attribution). He felt confident about "all strategies in all sessions" (Self-Evaluation) and that the "selected passage worked out quite nicely [achieving] a slightly more refined performance and a feeling of sureness while playing" (Self-Evaluation; Affect). Overall, his "musical shape for the passage was quite successful and it had a natural flow" (Self-Evaluation); in fact, he "remember[ed] nothing whatsoever of playing the passage which might be a sign that I was into playing at that moment instead of being very analytical about my thoughts" (Self-Satisfaction). William also reported that there was "some room for improvement in how to balance things together with the piano, as [for instance,] I was forced to go slightly outside the boundaries of tone color suitable for the passage to stay balanced volume-wise" (Adaptive). All in all, he considered the intervention "an interesting experiment," and that for further development, he could "have added some time rehearsing the passage together with my chamber music partner by using the [OMMP] tool" (Adaptive).

6 Discussion

A major imperative for any aspiring musician involves transitioning from a highly structured and organized learning environment under the external influence of a master teacher to a professional environment where the musician is placed under constant pressure to find solutions and prepare for performances mainly on their own. To successfully navigate this transition, musicians not only need to have developed the confidence and skills needed to survive as professional musicians (in line with López-Íñiguez and Bennett, 2020), but the abilities also to self-regulate their own learning in ways that allow them to take personal responsibility for monitoring and controlling their own performance (McPherson, 2022).

As described earlier in this article, the behavioral, cognitive, and affective sub-process described in the Self-Regulated Learning approach are now being used to develop microanalysis protocols that can effectively cue and focus the attention of learners before, during and after they have practiced or performed. A prime aim of these protocols is to help developing musicians maximize their ability to achieve at an even higher level. In this study, we explored the use of the Optimal Music Microanalysis Protocol (McPherson et al., 2015; Osborne et al., 2021) to examine (1) the types of self-regulated learning sub-processes musicians described to evaluate the quality of their individual practice session (and how these might be different across the four musicians), and (2) the ways in which the musicians reported the effectiveness of the microanalysis technique for improving their practice and subsequent performance.

For the results reported here, we can observe that the four musicians displayed varying degrees of ability to optimize their own performance as they monitored and controlled what they did, thought, and felt during each practice session. For example, Olga was constantly focusing on her negative feelings regarding her lack of strategies, and her thoughts and actions during practice did not match her goal of trying to convey the beauty of the phrasing in the repertoire she was mastering to her audience. Importantly, she directed most of her attention to technical aspects as she tried to achieve a better sound and intonation through repetitions of the selected passages. Lukas—who, like Olga, had short study sessions, kept working on similar goals, and was externally motivated to practice—spent part of his practicing focusing on shifting his 'mood' toward a more positive one, through body relaxation. He mostly wanted to achieve a better dynamic range to balance the excessive piano coverage, for which he worked on some sudden volume changes, playing slowly, created rhythmic variations of the passages that were softer, and achieving more clarity in the intonation by using the tuning machine.

Unlike Olga and Lukas, Xie set herself different and more complex goals and strategies for each subsequent practice session, and the amount of time spent was longer, although she also wanted to ensure that her body was relaxed and that she felt comfortable while performing. Her ability to plan strategically in different ways for each session means that she was able to focus her attention on "small details, thinking about the image of the passages, and not so much on the technique." She set alarms for her practice, read books to inform her practice, used the metronome, video recorded, and critically analyzed her practice, used creative strategies for intonation, rhythms, and shifts. These tasks were oriented toward achieving the bigger picture and the musical expression of her selected passages, with an overall goal of enjoying learning for herself. William—who shared with Xie this internal process of learning and personal development—was even more fastidious with his practice, and besides doing many of the things his colleagues engaged with, he added singing, harmony reductions and analysis, and playing not only on the cello but also on the piano, which ensured that he knew his selected passages inside out. William not only wanted to make the music material more expressive, but to have a personal artistic voice that would stand out.

In general, all participants acknowledged that the OMMP helped them to achieve a more concentrated focus during their practice, and that they generally played the selected passages much better during the public concert than during the pilot performance. This was explained not only in terms of having had several additional weeks to practice, but to having had the possibility to reflect in a "deeper way than usual" [Olga], and to recognize that "without the [OMMP] tool, I definitely would have not reached this performance level for these passages" [Xie]. The OMMP therefore allowed each individual musician "the time to pause for a moment and think what I really want to achieve and assess whether I am actually achieving it" [William]. It also allowed them to "focus for once on one thing at the time" [Lukas].

We acknowledge that, even if the OMMP tool helped these four highly proficient musicians in enhancing their performances, there were striking differences in the goals and strategies that they chose for their practicing sessions. We explain this in terms of the presence or lack thereof of a *learner identity* in participants at the level of practice (i.e., Coll and Falsafi, 2010; Falsafi, 2011). A learner identity in musicians implies seeking to learn as a means of achieving a fulfillment of the self (e.g., Valdés et al., 2016) and acknowledging that "learning how to learn requires learning to be a learner" (Sinha, 1999, p. 41). This type of identity requires critically assessing "what we are not" (Reay, 2010, p. 2) with humility, for which recognizing ourselves as learners across the lifespan, undoubtedly sets musicians in an ideal learning zone and mindset that makes them more strategic and curious (e.g., López-Íñiguez and Bennett, 2021). Pairing this type of identity and approach to learning with the OMMP tool is an efficient way for musicians to get the most out of their practicing sessions and achieve creative artistic outputs during their concerts.

In conclusion, this article has outlined a technique for clarifying those sub-processes of a musician's learning profile that would benefit from more purposeful attention before, during, and after practice sessions and public performances. Optimizing performance might involve devising strategies for encouraging musicians to be more attentive to the need to set goals and to identify ways of planning before practice has begun, in addition to working to motivate oneself, so that practice is even more efficient. In this regard, we agree with McPherson et al. (2019) and Osborne et al. (2021) who suggest that the technique outlined here provides a framework that can be adapted and modified to fit various learning contexts, depending on the developmental trajectory of the music learner.

Data availability statement

The datasets presented in this article are not readily available because the datasets for this study are not available in order to ensure the anonymity of participants. Requests to access the datasets should be directed to guadalupe.lopez.iniguez@uniarts.fi.

Ethics statement

The studies involving humans were reviewed by Uniarts Helsinki Research Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

GL-Í: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. GM: Conceptualization, Resources, Validation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This work was funded by the Research Council of Finland (grant number 315378) awarded to the first author, and by the Australian Research Council through two projects (grant numbers DP150103330 and DP-150103330) awarded to the second author.

Acknowledgments

The authors express their gratitude to all musicians who participated in this study for their generous time.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2024.1368074/full#supplementary-material

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 24 May 2024
DOI 10.3389/fpsyg.2024.1387009

OPEN ACCESS

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RECEIVED 16 February 2024
ACCEPTED 30 April 2024
PUBLISHED 24 May 2024

CITATION
Abdel Latif MM, Alghizzi TM and Alshahrani TM (2024) The impact of genre-based instruction on Saudi university students' English writing performance and motivation: a mixed-method study. *Front. Psychol.* 15:1387009. doi: 10.3389/fpsyg.2024.1387009

The impact of genre-based instruction on Saudi university students' English writing performance and motivation: a mixed-method study

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Despite the important role motivation plays in students' writing learning and development, not much attention has been given to experimenting particular instructional techniques for developing students' writing motivation. One of the least researched teaching techniques in writing motivation studies is genre-based instruction. In this study, we examined the impact of genre-based instruction on 21 Saudi university students' English argumentative and classification essay writing performance and their writing motivation dimensions (writing apprehension, anxiety, self-efficacy and self-concept). Drawing upon the quasi-experimental research design and non-random sampling technique, we used genre-based instruction with a representative intact class of English-as-a-foreign-language (EFL) writing students at a Saudi university. To examine the potential impact of the treatment, we collected pre- and post-instruction data, along with data gathered through an open-ended questionnaire. The results showed that genre-based instruction has contributed significantly to improving the students' writing performance and also their writing motivation dimensions. These positive gains varied from one writing quality aspect and motivational variable to another. The students' answers to the open-ended questionnaire also showed the positive writing learning and motivation improvements they experienced. It is generally concluded that developing students' language and rhetorical awareness and text composition performance seems to be a prerequisite for improving their writing motivation levels. The paper ends with discussing the implications of the results.

KEYWORDS

genre-based instruction, writing motivation, writing pedagogy, writing psychology, writing performance, genre-based writing instruction

1 Introduction

Learning and instructional practices play an important role in shaping students' writing motivation. Research generally indicates that the larger portion of language and writing learning motivation factors concern instructional practices rather than learning ones (e.g., Atay and Kurt, 2006; Lo and Hyland, 2007). Despite this, examining the motivating impact of particular writing teaching techniques on students' affect is an issue yet to be given due attention.

Previous instructional studies have examined the impact of interventional treatments on students' writing performance and motivation. The treatments used in previous research include: technology-supported instruction (e.g., Li et al., 2014; Zhang et al., 2014; Jiang and Luk, 2016; Kramer and Kusurkar, 2017), strategy instruction (e.g., Limpo and Alves, 2014; De Smedt et al., 2019), feedback treatments (e.g., Duijnhouwer et al., 2012; Tang and Liu, 2017; Yao, 2019), and task interest-based instruction (e.g., Hidi and Anderson, 1992; Hidi et al., 2002). While there is some reasonable research on such interventional types, scarce studies have looked at how students' writing performance and motivation could be fostered by genre-based instruction. There is a dire need for addressing this issue in some particular foreign language writing learning environments. For example, students in the Saudi university context experience writing skill deficiencies causing them to be demotivated to write (e.g., Abdel Latif, 2011; Altukruni, 2019; Qasem and Zayid, 2019). Helping these studies overcome their English writing performance problems and demotivation requires teaching writing to them using different instructional techniques (e.g., Al-Khairy, 2013; Khadawardi, 2022). Therefore, in this study we examined the potential impact of genre-based instruction on Saudi university students' English writing performance and motivation.

2 Literature review

2.1 Writing motivation and its correlates

Motivation plays an essential role in students' writing learning, performance and development. Writing motivation is generally conceptualized as a multifaceted construct which interacts with learners' developmental stages, disciplines and environments (Wright et al., 2019). There have been some previous attempts in conceptualizing writing motivation (e.g., Hidi and Boscolo, 2007; Wright et al., 2019; Abdel Latif, 2021). In light of such taxonomies, learners' motivation is viewed as an umbrella term encompassing their liking or disliking of writing situations and perceived value of writing, the situational feelings they experience while writing and the way they regulate them, the beliefs about their writing ability and skills, and their desired goals for learning to write (Abdel Latif, 2021). With this definition, writing motivation constructs can be categorized into four main types: (a) attitudinal/dispositional constructs (writing apprehension and perceived value of writing); (b) situational constructs (writing anxiety and motivational regulation of writing); (c) writing ability belief constructs (writing self-efficacy and self-concept); and (d) writing learning goal constructs such as writing achievement goal orientations (see Abdel Latif, 2021).

Literature indicates that students' writing motivation is associated with some variables. Abdel Latif (2021) classifies these variables into the following three categories: (a) personal variables (i.e., age, gender and socio-cultural background); (b) performance and belief correlates such as language ability, writing performance, and perceived language and writing competence beliefs; and (c) learning and instruction practices which include the writing topics assigned, and the teaching materials and instructional techniques used. Research implies the motivating impact of assignment topics on students' writing motivation (e.g., Behizadeh and Engelhard, 2014). Some studies also indicate that students' writing demotivation can stem from inappropriate instruction practices (Atay and Kurt, 2006; Abdel Latif, 2015), or the lack of interesting teaching materials (Lo and Hyland, 2007). Accordingly, optimizing writing instruction is key to getting students motivated to write.

2.2 Previous research on genre-based writing instruction

Genre-based instruction is an explicit and consciousness-raising writing teaching technique designed for helping students be familiar with the communicative purposes and the linguistic structures and rhetorical conventions and features of particular genres (see Hyland, 2004, 2016). It draws mainly on getting students to model these features in their own texts. Such technique is particularly important to second language (L2) writing students as it could help in improving their linguistic and communicative abilities (Leki et al., 2008; Paltridge, 2013). It enables students to become successful members in their disciplines by familiarizing them with academic writing norms in the target genre, and with the language and genre features constituting its discourse (Van de Poel and Gasiorek, 2012).

Previous studies testing the impact of genre-based instruction on students' writing are generally scarce. Some of these few studies examined how the use of genre-based feedback influences students' text revisions. For example, Martínez Esteban and Roca de Larios (2010) engaged their L2 students in revising their written texts based on noticing and comparing them to native-speaker model ones. They found that model text noticing and comparison helped their students to incorporate a considerable number of textual and linguistic features in their subsequent revisions. Luquin and Mayo (2021) also examined the effect of collaborative genre-based revision on L2 students' text quality, and ability to solve content and linguistic problems while revising texts. Their study revealed that the experimental group students were able to incorporate a significantly larger number of mechanics- and discourse-related aspects into the post-treatment writing. It is worth to note that these two studies did not deal with the impact of genre-based instruction on students' writing motivation.

There is a paucity of research investigating the way students' writing motivation may be influenced by genre-based instruction. Yasuda (2011) reported a study which mainly addressed how genre-based tasks foster L2 students' language knowledge and writing performance. Her interview data showed that the participants' improved language knowledge levels resulting from genre-based instruction led them to have subsequent better writing ability confidence. Two in-depth studies addressing the impact of genre-based instruction on writing motivation were reported by Van de Poel and Gasiorek (2012) and Han and Hiver (2018). Van de Poel and Gasiorek (2012) used genre-based instruction in two writing courses. Their data showed that the students significantly perceived themselves as more competent writers and had a more positive attitude toward getting feedback from teachers and peers. On the other hand, Han and Hiver (2018) investigated the influence of genre-based instruction upon L2 students' writing self-efficacy and apprehension. They assessed these two motivational constructs using scales before and after instruction, and students' reflective journal and interviews. Han and Hiver found that genre-based instruction positively impacted their students' writing self-efficacy; such improvement was ascribed to the writing mastery experiences the students had during the

genre-based instruction received. However, they found an increase in the students' writing apprehension, which was attributed to their previous poor writing experiences. Apart from its motivating impact, the two studies published by Van de Poel and Gasiorek (2012) and Han and Hiver (2018) also found a positive effect for genre-based instruction on students' writing performance.

Due to the scarcity of relevant research and also the narrow scope of these previous few relevant studies, there is a need for further research exploring the relationship of genre-based instruction with students' writing motivation from a broader angle. First, we can combine writing performance with writing motivation data; such combination will show us how any potential improvement in students' writing performance relates to their writing motivation. Second, it can be noted that the previous few more relevant studies (e.g., Van de Poel and Gasiorek, 2012; Han and Hiver, 2018) only dealt with students' writing self-ability beliefs and apprehension. Therefore, there is a need for addressing a wider range of writing motivation constructs in genre-based instruction research. Finally, it is also important to look at the effect of genre-based instruction on students' performance on two task types; this will give us a clearer picture about its potential impact. Tackling these issues in the Saudi university context could help students overcome the writing performance and motivational problems revealed in previous research (e.g., Abdel Latif, 2011; Al-Khairy, 2013; Altukruni, 2019; Qasem and Zayid, 2019; Khadawardi, 2022).

3 The present study

The present study tried to address these gaps by looking at the effect of genre-based instruction on Saudi university students' English writing performance on two task types, and on their writing apprehension, anxiety, self-efficacy and self-concept. Thus, the originality of the present study stems mainly from addressing these four writing motivation constructs rather than one or two motivational variables only. Accordingly, the present study is guided by the following three research questions:

- To what extent does genre-based instruction influence Saudi university students' English writing performance on argumentative and classification tasks?
- How does genre-based instruction affect Saudi university students' English writing apprehension, anxiety, self-efficacy and self-concept?
- How do Saudi university students perceive genre-based writing instruction and its potential impact on their writing motivation?

As may be concluded, the present study depended on the quasi-experimental research design. We specifically used the one-group pre-post-test design which allows a deeper observation level for comparing the participants' scores on the same measures before and after the treatment (Johnson and Christensen, 2019). We experimented genre-based writing instruction with a sample of English majors at a Saudi university. The study made use of a mix-method research approach by collecting pre- and post-test data, along with a post-course evaluation questionnaire. With this research approach, the study could have important contributions to writing instruction and motivation literature.

3.1 Participants

The study was conducted at a Saudi university with a sample of students majored in English. The sample consisted of 21 students who were in their second year of university study. The students were all in one intact class, and they were attending a 4-year English language teacher/translator education program during the data collection stage. During the data collection stage, this class included the highest number of English writing students in the target university campus. The study drew upon convenience sampling which is a non-random sampling technique. Despite its limitations, convenience sampling is the most commonly used sampling technique in L2 teaching studies (Farrokhi and Mahmoudi-Hamidabad, 2012). In light of literature-based recommendations (e.g., Mackey and Gass, 2005; Dörnyei, 2007), the potential bias in this sampling technique was overcome by selecting a highly representative intact class of English writing students at this level. The students in this intact class resembled second-year peers in their previous university English writing experiences and writing achievement levels. Like their peers in other English language teacher/translator education programs at Saudi universities, the students in the selected intact class received university instruction in writing English essays of various genres for three terms prior to conducting the study. In the 10-week writing course in which the study was conducted, the students studied how to write 5-paragraph argumentative and classification English essays; this was their first time to study the two essay genres. However, it is worth mentioning that prior to this course, the students had studied how to write compare-and-contrast essays, an essay genre similar to the classification one. All the students were males of Saudi nationality. We focused on male students only to control any potential gender-related differences in students' responses to genre-based writing instruction, an issue beyond the scope of the present study. All the participants provided informed consent to take part in the study on a voluntary basis after explaining the purpose of the study to them and confirming the confidentiality of their personal data.

3.2 The genre-based writing instruction used

As indicated above, the study was conducted in an English writing university course which lasted for 11 academic weeks, two classes of 3 h per week. In the first 5 weeks, the students studied argumentative essay writing, and in the last 5 weeks they studied classification essay writing. The second author was the faculty member who taught the course to the 21 students. In teaching each of the argumentative and classification essays to the students, the following three phases were followed:

- *Phase 1: Getting students to read model texts in the target genre*. This phase lasted for two academic weeks and it aimed at fostering students' writing knowledge through getting them to analyze the rhetorical features and structure of the target essay genre. In this phase, the students read ten model essays of the target genre. They started by reading four model essays with marked rhetorical and linguistic features so as to guide them in understanding the genre; and then they collaboratively and later independently read the remaining six model essays and identified their the main rhetorical features, and the common phrases and words used in them.

- *Phase 2: Getting students to collaboratively model essay parts in the target genre*. This phase was implemented in the second and third weeks of teaching each genre. In this phase, the students collaboratively wrote essay parts in the classroom, and this was followed by teacher feedback. In the third week, their collaboratively composed essay parts were peer evaluated, and then received teacher feedback on essays parts. The peer feedback activities were guided by using an evaluation rubric for assessing the inclusion of particular rhetorical features in each essay part.
- *Phase 3: Assigning students independent writing tasks in the target genre*. In this phase, which was implemented in the fourth and fifth weeks of teaching each genre, the students were asked to independently write two essays in the target genre as homework assignments, one essay in each week. Then the essays written by all the students in each week were anonymously complied in Word files for teacher feedback and peer evaluation in the classroom. Like the previous phase, peer feedback activities in this one were also guided by the evaluation rubric. In the two phases, the teacher supported the students' writing learning activities through scaffolding.

3.3 Instruments

The study used following the following types of instruments:

3.3.1 Writing tasks

To test students' writing performance before and after the genre-based instruction, we used a pre-test and a post-test of two obligatory argumentative and classification writing tasks each. The tasks in the two tests were different to avoid the potential influence of topic familiarity on students' writing performance on the post-test. The writing tasks in the pre-test asked the students to argue for or against the negative influence of social media (the argumentative task), and to talk about the different learning styles: learning by doing things, by reading about things; by listening to people, and talking about things (the classification task). In the post-test, the students were asked to argue for or against having a job while studying at university (the argumentative task), and to talk about the various types of restaurants in Saudi Arabia (the classification task). As noted, the tasks in the two tests do not require specialized knowledge. The time allocated for completing each test was 2 h.

3.3.2 Writing motivation measures

The study used the following four measures to assess the students' writing motivation before and after instruction:

- *The English Writing Apprehension Scale*. This is a 12-item measure that assesses students' apprehension of writing and writing evaluation situations. This scale was developed previously by Abdel Latif (2015). The following are examples of the statements included in the scale: "*I usually do my best to avoid writing English essays, I do not like my English essays to be evaluated,* and *I have no fear of my English writing being evaluated*." A 5-point Likert-type scale (strongly agree, agree, uncertain, disagree, and strongly disagree) is used with the statements. Scores on the scale range from 12 (the minimal score) to 60 (the maximal score). The scale had an Alpha Cronbach reliability coefficient of 0.85.
- *The English Writing Anxiety Scale*. This 12-item scale measures students' situational feelings or how anxious they feel while performing the writing tasks. The scale is divided into two parts: the items in first part were adapted from Cheng (2004) Second Language Writing Anxiety Inventory and this part asks students to rate their anxious feelings in writing situations, whereas the items in the second part were adapted from Woodrow's (2011) writing anxiety scale and it asks them to rate how anxious they feel when producing particular text parts. Examples of the items given in the first part: "*I tremble or perspire when I write English essays under time pressure,* and *I feel panicky when I start writing an English essay*"; examples of the items given in the second part: "*How anxious were you when trying to do the following writing activities? Writing sentences without mistakes, and writing a well-organized paragraph*." A 5-point Likert-type scale (always, often, not sure, seldom and never) is used with the statements in the first part, and another 5-point Likert-type scale is used with the statements in the second one (very anxious, anxious, not sure, non-anxious, and non-anxious at all). Scores on this scale range from 12 (the minimal score) to 60 (the maximal score). The scale had an Alpha Cronbach reliability coefficient of 0.76.
- *The English Writing Self-Efficacy Scale*. This 10-item scale is a modified version from the one used previously in Abdel Latif (2015) study. It measures students' confidence in writing a text with particular features, or performing task-specific writing skills such as correctly punctuating sentences, organizing sentences, writing sentences with appropriate grammatical structures and vocabulary, and writing essays parts and paragraphs appropriately. Examples of the statements included in the scale: "*When writing English essays, I am able to: correctly punctuate sentences and paragraphs, write an interesting introduction with a good thesis statement, organize sentences into a paragraph so as to clearly express a theme,* and *write an interesting conclusion paragraph*." A 5-point Likert-type scale (always, often, not sure, seldom and never) is used with the statements. Scores on the scale range from 10 (the minimal score) to 50 (the maximal score). This modified version of the English Writing Self-Efficacy Scale had an Alpha Cronbach reliability coefficient of 0.81.
- *The English Writing Self-concept Scale*. This 12-item measure taps students' beliefs about and confidence in their general writing abilities and the improvability and learnability of writing. The 12 items in this scale were adapted from previous relevant measures (e.g., Palmquist and Young, 1992; Pajares et al., 2001, 2007; Ehm et al., 2014; Limpo and Alves, 2014). Examples of these items include: "*I believe I was born with the ability to write well in English, my teacher thinks I am a good writer, I cannot improve the quality of my English essays,* and *I write better than other students in my class*." A 5-point Likert-type scale (always, often, not sure, seldom and never) is used with the statements. Scores on the scale range from 12 (the minimal score) to 60 (the maximal score). This adapted version of this scale had an Alpha Cronbach reliability coefficient of 0.74.

With regard to the validity of the above measures, the scales assessing the students' English writing apprehension and self-efficacy (the first and third measures) have already been validated in a previous work (see Abdel Latif, 2015), whereas the scales assessing their English

writing anxiety and self-concept (the second and fourth ones) were validated through our discussion of how their items match the adopted definitions of the two constructs. In our discussion, we followed the guidelines suggested for validating writing motivation measures (Abdel Latif, 2021). Through this discussion, we concluded that the items of these two scales match our definitions of the two writing motivation constructs.

3.3.3 Post-course evaluation questionnaire

The study also used an open-ended post-course evaluation questionnaire for collecting data about students' writing learning and motivation experiences after receiving the instructional treatment. The students' answers to the questionnaire were used to supplement the quantitative data. The rationale for using the open-ended questionnaire rather than interviews is that it minimizes the students' social desirability, given that they would respond to it anonymously. The questionnaire includes eight open-ended questions which are primarily concerned with the students' evaluation of the teaching technique used, the perceived strengths and weaknesses of the course, and the potential changes in their writing performance and motivation. The questionnaire was written in Arabic and students were asked to answer the questions in Arabic so as to communicate their perceptions and evaluations more easily. It was also written using Google Forms to enable the students complete it out of the classroom and thus provide as objective answers as possible.

3.4 Data collection and analysis procedures

The data collection process was completed through a number of steps. It started with administering the pre-measures (the writing test and the writing apprehension, anxiety, self-efficacy and self-concept scales) to the students. These instruments were administered by the second author during the first week in an additional session that lasted for two and a half hours (30 min for completing the motivation measures and 2 h for completing the writing tasks). Following the provision of the genre-based instruction in 10 weeks, the second author administered the post-measures (the writing test and the writing apprehension, anxiety, self-efficacy and self-concept scales) in another additional 2.5-h session. While completing the pre- and post-tests of writing, the students were not allowed to access any online materials, but they could use printed dictionaries. This was intended to prevent any potential plagiarism attempts from online sources; students' copying of online materials would not reflect their real English writing levels. Finally, at the end of the last academic week (week 10), the students were asked to complete the open-ended questionnaire on their own out of the classroom. This last procedure was followed to minimize their potential social desirability.

After collecting the data, we collaboratively analyzed it. We started by marking the students' essays on the pre- and post-tests using Jacobs et al.'s (1981) ESL Composition Profile with which the text is rated in terms of its content (30 points), organization (20 points), vocabulary (20 points), language use (25 points), and mechanics (spelling and punctuation) (5 points); thus totaling 100 points. The essays the students wrote on the pre- and post-tests were co-rated by the second and third authors, and the mean scores for both ratings were calculated. To check the reliability of the essay marking made by each rater, we conducted Cronbach's alpha reliability analyses of the scores the two raters gave to the five above-mentioned analytic text quality dimensions in all the essays scored. The scores given by the two raters had an average Cronbach's alpha reliability coefficient of 0.93. The students' pre- and post-scores on the motivational measures were also counted. Following this, we compared the students' pre- and post-treatment scores on the writing tasks and psychological measures. Kolmogorov–Smirnov and Shapiro–Wilk tests showed that the data was not normally distributed, and this means non-parametric tests were more suitable for analyzing it. Therefore, we analyzed the data inferentially using the Wilcoxon Signed Ranks Test which is a well-suited non-parametric test. As for the questionnaire data, we independently read the students' answers to the questions to identify the dominant themes in them. We then had an online meeting for discussing our qualitative data analysis, and for agreeing on the optimal way for presenting the questionnaire data.

4 Results

In the following three subsections, we present the results of the data analyses. As will be noted, the presentation of these analyses is guided by the three research questions.

4.1 The impact of genre-based instruction on the students' argumentative and classification essay writing performance

Table 1 shows the means and standard deviations of the students' analytic scores on the pre- and post-tests of argumentative and classification writing. It can be noted that the students' scores on all the textual dimensions have increased on the post-test as compared to the pre-test. Compared to the ideational and organizational text aspects, the students' vocabulary and language use (i.e., language-related text aspects) mean scores on the pre-test were lower ($M = 8.3$ and 9.1, respectively). But given the writing assessment rubric points allocated to both vocabulary and language use (20 and 25 points, respectively), it is noted that the students made better improvements in these two areas compared to the ideational and organizational text aspects on the argumentative tasks, that language use was generally the writing area in which they made the best improvement.

Meanwhile, the students' writing mechanics scores considerably improved on the argumentative task ($M = 2.8$ and 4.2 on the pre- and

TABLE 1 The means and standard deviations of the students' writing scores on the pre- and post-tests.

Text quality aspect scores	Argumentative task				Classification task			
	Pre-testing		Post-testing		Pre-testing		Post-testing	
	M	SD	*M*	SD	*M*	SD	*M*	SD
Content	15.5	2.8	22.6	3.6	17.7	5.1	24.5	5.2
Organization	9.4	2.4	15.1	1.9	10.4	3.8	16.1	3.7
Vocabulary	8.3	1.6	15.9	2.3	11	3.9	15.9	2.5
Language use	9.1	3.2	18.7	3.4	11	6.1	20	5.1
Mechanics	2.8	0.8	4.2	0.7	3.1	1.1	4.1	0.97
Total score	45.2	10.4	76.7	11.6	54.1	19	80.6	16.9

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TABLE 2 The Wilcoxon Signed Ranks Test analyses of the students' writing scores on the pre- and post-tests.

Text quality aspect scores	Task type	Mean ranks		Sum of ranks		Z	*p*-value
		N. ranks	P. ranks	N. ranks	P. ranks		
Content	Argumentative task	2.5	10.9	2.5	207.5	3.832	0.000
	Classification task	7.2	10.3	14.5	175.5	3.245	0.001
Organization	Argumentative task	0.0	10.5	0.0	210	3.931	0.000
	Classification task	8.7	17.5	11.2	213.5	3.410	0.001
Vocabulary	Argumentative task	0.0	11	0.0	231	4.025	0.000
	Classification task	10	10.5	20	190	3.178	0.001
Language use	Argumentative task	0.0	11	0.0	231	4.018	0.000
	Classification task	8.5	10.7	17	193	3.287	0.001
Mechanics	Argumentative task	0.0	9.5	0.0	171	3.810	0.000
	Classification task	10.7	10.4	43	167	2.380	0.017
Total scores	Argumentative task	0.0	11	0.0	231	4.015	0.000
	Classification task	6.7	10.9	13.5	196.5	3.416	0.001

N. ranks, negative ranks; P. ranks, negative ranks.

post-tests, respectively) but not that much on the classification one ($M = 3.1$ and 4.1 on the pre- and post-tests, respectively). This might have been caused by the task completion order, given that the students were supposed to complete the argumentative writing task before the classification one. Meanwhile, it is also noted that the students' pre-test scores on the classification task are higher than those of the argumentative one ($M = 54.1$ and 45.2, respectively), but the differences between the total scores on the two tasks in the post-test decreased ($M = 80.6$ and 76.7, respectively). As implied above, the students' higher scores on the classification task may have been caused by their previous study of the compare-and-contrast essay type which is similar to the former one.

The Wilcoxon Signed Ranks Test confirmed the significance of these noted differences. Table 2 gives the results of the Wilcoxon Signed Ranks Test analyses of the students' writing scores on the pre- and post-tests. As the table show, all these mean differences are significant with the exception of the mechanics mean scores on the classification task. Overall, these significant differences indicate that genre-based instruction helped the students improve their English argumentative and classification essay writing in terms of text content, organization, vocabulary, and language use. As a result, genre-based instruction also helped in significantly improving the students' total essay scores on both task types.

4.2 The impact of genre-based instruction on the students' writing motivation

Table 3 provides the means and standard deviations of the students' scores on the pre- and post-measures of writing motivation. As noted, there are improvements in the four writing motivations dimensions. The largest differences between the students' mean scores on the pre- and post-measures of writing motivation are in those of writing anxiety and self-concept, respectively. Meanwhile, the students attained better improvements in fostering their writing self-efficacy than in alleviating their writing apprehension ($M = 26.7$ versus 40.9 out of 50 for the writing self-efficacy measure, and 40.9 versus 26.1 out of 60 for the writing apprehension measure).

TABLE 3 The means and standard deviations of the students' scores on the pre- and post-measures of writing motivation.

Writing motivation variables	Pre-testing		Post-testing	
	M	SD	*M*	SD
Writing apprehension	40.9	14.5	26.1	11.8
Writing anxiety	41.4	14.1	21.9	10.2
Writing self-efficacy	26.7	13.6	40.9	9.4
Writing self-concept	30.5	16.4	46.1	9.7

The significance of these noted differences was also confirmed by the Wilcoxon Signed Ranks Test. Table 4 gives the results of the Wilcoxon Signed Ranks Test analyses of the students' scores on the pre- and post measures of writing motivation. The table shows that the differences between the students' mean scores on the pre- and post-measures of the four writing motivation dimensions are all statistically significant. This indicates that the genre-based instruction has led to decreasing the students' writing apprehension and anxiety and also enhancing their writing self-efficacy and self-concept.

4.3 The students' evaluation of genre-based writing instruction and perceptions of their writing motivation development

The students' answers to the open-ended questionnaire questions supported the above quantitative data about the gains in their English writing performance and writing motivation. Nineteen of the 21 students reported very positive views on the genre-based instruction they received. These students found genre-based writing instruction a completely different teaching technique from the ways English writing were taught to them previously. They particularly liked the idea of studying multiple essay models and analyzing their structures. This can be noted in the following two exemplary answers:

TABLE 4 Results of the Wilcoxon Signed Ranks Test analyses of the students' scores on the pre- and post measures of writing motivation.

Writing motivation variables	Mean ranks		Sum of ranks		Z	*p*-value
	N. ranks:	P. ranks:	N. ranks:	P. ranks:		
Writing apprehension	11.3	7.1	181.5	28.50	−2.857-b	0.004
Writing anxiety	11.2	3.3	180	10	−3.422-b	0.001
Writing self-efficacy	4.4	12.5	22	188	−3.101-c	0.002
Writing self-concept	5.7	12.2	23	208	−3.217-c	0.001

N. ranks, negative ranks; P. ranks, negative ranks.

– *I liked this teaching method very much and I found it interesting and useful. It requires critical thinking and analysis, and differs completely from the teaching methods in our previous essay writing courses. It depends on our collaborative analysis of the models to understand the essay organization, vocabulary and the language.*
– *In my opinion, this is a very good teaching method as we have seen and analyzed many essay models. I found a clear focus on developing our writing skills through guiding and motivating us to analyze the model essays and notice their steps and main language elements, and also to improve our writing skills in presenting ideas and arguments logically. The classroom activities helped us greatly in understanding how to write essays in a better way. For me, this is a completely new method.*

In their answers to another questionnaire question related to the perceived benefits of genre-based instruction, they students mentioned a number of positive aspects. Collectively, these include: modeling texts or having a model to guide one's writing, composing the text following certain steps, developing vocabulary and structures related to the target essay type, becoming more motivated writers, having a more positive attitude toward collaborative writing and classroom activities, understanding the process of learning how to learn writing, and recognizing the importance of reading for writing. In the two answers below, the students refer to some of these benefits:

– *Yes, I benefited how to write different essay types based on finding and reading model essays and analyzing their grammar, connectors, and vocabulary. I also learned how to write a well-organized essay by using appropriate structures and arguments, and related vocabulary. My confidence in my writing has greatly increased.*
– *I learned many things in this course. First, collaborative work is very important in learning writing. Second, analyzing model essays is essential to know the vocabulary and grammar I'm supposed to use. I also understood how to organize my essays and to model an essay I have read.*

On the other hand, four students congruently reported that genre-based instruction is time-consuming and that it requires many efforts from them as students. They generally viewed it is inappropriate for the students with low writing motivation or poor language proficiency. One student expressed these concerns as follows:

– Honestly, I did not like this method because it requires many things such as time and effort. Yes, it is a different teaching method but it requires me to do a lot in the classroom.

The above answer suggests that some students in this context may not be used to learner-centered teaching.

With regard to the students' perceived improvement in English writing, the vast majority of them reported experiencing writing development perceptions as a result of receiving genre-based instruction. For some students, such perceived improvement was associated with the higher essay scores and more positive teacher feedback they received during the course. For other students, they had improved perceptions of their writing ability as a result of developing particular writing skill dimensions such as: having fluency with generating ideas and putting them into language, writing more text quantity easily, and organizing the text more effectively. The following exemplary answers indicate some of these factors:

– *Yes, my writing has improved. This is indicated by the higher scores I got on my essays this term.*
– *Sure. Now I can find ideas quickly and vocabulary easily, and I no longer think in Arabic when writing.*
– *Yes, I can write more easily and in a faster way now. In the previous terms, I used to take a long time to write an essay of 100 or 150 words, but now I can write 500 words in about 3 h.*
– *I feel my English writing has improved a lot as I learned how to organize my ideas and opinions in a better way, and how to support my ideas.*

With such perceived improvements in their writing performance, many students mentioned in their answers to the final interview question called for using genre-based instruction in the future writing courses they would attend.

5 Discussion and conclusion

As indicated above, the use of genre-based instruction has resulted in improving the students' English argumentative and classification writing performance in terms of text content, organization, vocabulary, language use, and– to a less extent– mechanics. Relatively better improvements were particularly noted in the students' language use and vocabulary, respectively. These writing performance improvements have been accompanied by enhancement of the students' writing motivation. Specifically, the students' English writing self-efficacy and self-concept increased whereas their English writing apprehension and anxiety decreased. The students' answers to the open-ended questionnaire supported the results of the quantitative data. The students particularly liked some features in genre-based writing instruction such as studying multiple model texts and understanding the vocabulary used in the target genre, and they perceived some improvements in their writing

performance such as becoming more aware of genre rhetorical features, and developing a better writing fluency level.

These results concur with previous research findings that genre-based instruction fosters students' writing ability (e.g., Martínez Esteban and Roca de Larios, 2010; Yasuda, 2011; Van de Poel and Gasiorek, 2012; Han and Hiver, 2018; Luquin and Mayo, 2021). Besides, these results emphasize the view that genre-based instruction enhances students' linguistic and communicative abilities (e.g., Leki et al., 2008; Paltridge, 2013). Overall, the present results support the conclusion that when students develop an expected level of language awareness and writing competence, they become more motivated to write (e.g., Cheng et al., 1999; Pajares and Valiante, 2001; Hertz-Lazarowitz and Bar-Natan, 2002; Abdel Latif, 2015, 2019; Limpo and Alves, 2017; Torres et al., 2020). Our results are also consistent with those of the few published studies indicating that genre-based instruction enhances students' writing motivation (e.g., Yasuda, 2011; Van de Poel and Gasiorek, 2012; Han and Hiver, 2018). The study emphasizes the importance of instructional practices in shaping students' writing motivation (e.g., Lo and Hyland, 2007; Behizadeh and Engelhard, 2014).

Overall, the above results imply that some particular writing instruction characteristics are conducive to developing L2 students' writing performance and nurturing their writing motivation. These characteristics include: exposing students to multiple model texts, familiarizing them with the common vocabulary and organizational patterns of the target text genre, engaging them in collaborative writing activities, raising their awareness of effective writing processes, and developing their ideational and linguistic fluency. As implied, teacher scaffolding and learner active role are key factors for genre-based writing instruction to be effective. Due to its potential benefits, we suggest incorporating genre-based instruction– or at least some of its above-mentioned features– into English writing courses in the Saudi university context in particular, and perhaps into other similar L2 writing learning environments. Once students reach the target level(s) in genre and language awareness, teachers can depend more on writing process instruction. This generally means that L2 writing instruction should be tailored to meet students' linguistic and strategic needs in order to positively influence their writing motivation (Abdel Latif, 2015, 2019, 2021).

While the present study has revealed important insights into the role of instruction in students' writing motivation, other relevant issues remain to be addressed in future research. There is a need for experimenting genre-based writing instruction in other educational stages and contexts to explore students' potential performance and motivation responses to it. Given that the present study used the one-group pre-post-test design, researchers interested in employing genre-based writing instruction in their futures studies may experiment it using other research designs. Besides, we need to examine the potential impact of other instructional techniques on students' writing motivation. Technology-supported instruction and feedback treatment types particularly deserve further research attention. In previous writing instructional research, it is generally noted that motivation has been addressed peripherally (see Abdel Latif, 2021). In future writing instruction studies, researchers need to give writing motivation constructs a prominent place, and to cover a wider range of them. Such research could help us have a clearer idea about the relative effects of various instructional types on students' writing motivation dimensions.

Author's note

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Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by The Deanship of Scientific Research at Imam Mohammad Ibn Saud Islamic University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MA: Conceptualization, Methodology, Project administration, Writing – original draft. TAlg: Conceptualization, Data curation, Formal analysis, Investigation, Validation, Writing – review & editing. TAls: Conceptualization, Data curation, Funding acquisition, Methodology, Validation, Writing – review & editing.

Funding

This work was supported and funded by the Deanship of Scientific Research at Imam Mohammad Ibn Saud Islamic University (IMSIU) (grant number IMSIU-RG23153).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 30 May 2024
DOI 10.3389/fpsyg.2024.1385840

OPEN ACCESS

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RECEIVED 13 February 2024
ACCEPTED 13 May 2024
PUBLISHED 30 May 2024

CITATION
Kavčič Pucihar A, Habe K, Rotar Pance B and Laure M (2024) The key reasons for dropout in Slovenian music schools – a qualitative study.
Front. Psychol. 15:1385840.
doi: 10.3389/fpsyg.2024.1385840

The key reasons for dropout in Slovenian music schools – a qualitative study

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Music education often struggles to sustain students' long-term commitment, with many perceiving lessons as frustrating or unengaging, leading to discontinuation. To address this gap, our study aimed to elucidate the primary reasons for dropout from the perspectives of various stakeholders, including students, parents, teachers, and principals. Drawing upon the self-determination theory, our research comprehensively investigated external and internal factors contributing to dropout. Among external factors, competing extracurricular commitments, music theory and solfége lessons, and teacher's approach emerge as the most prominent. Among internal factors, our findings highlighted the critical role of autonomy, competency, and relatedness in shaping students' decisions to continue or discontinue music education. Inadequate teacher-student relationships, limited peer interactions, and uninspiring classroom atmospheres significantly impacted dropout. Moreover, challenges in the music school curriculum, such as difficulties with music theory and solfège, resource limitations, and excessive workloads, emerged as prominent barriers to student engagement. By addressing these multifaceted issues, our study underscores the importance of fostering supportive environments that cater to individual needs and interests, ultimately enhancing the overall music education experience and reducing dropout rates. This research represents the first systematic empirical study in Slovenian music education, laying the groundwork for future quantitative investigations to advance education practices in Slovenia.

KEYWORDS

music schools, instrumental music education, dropout, music students, parents, instrumental music and theory teachers, music school principals

Introduction

Teaching and learning music have been recognized to serve various human needs. Blackwell & McPherson (2022, p. 72) argue that "over 95% of the population can benefit from systematic music education, and with sufficient practice and systematic training, can even develop their musical potential to a professional level." Reimer (1999) describes teaching and learning music as a way to improve one's ability to gain meaningful and gratifying musical experiences. "Learning a musical instrument can be one of the most enjoyable and rewarding hobbies or pastimes a child can pursue. However, it can also be one of the most frustrating" (McPherson et al., 2015, p. 418). An »alarmingly high« proportion of music students who start to learn a musical instrument subsequently give up (North et al., 2000, p. 270). The first significant surge of dropout comes at the age of 11 (Evans, 2009) and between ages 15 and 17

(Ruth and Müllensiefen, 2021). Williams (2002) suggests that the difficulty of keeping one's realistic perspective of one's self-image during adolescence contributes to one's decisions to continue or discontinue music study. Many music students gave up before achieving even basic proficiency, feeling dissatisfied with their learning experience and disillusioned with musical activities (Evans, 2009). In many cases, students enthusiastically start their lessons but discontinue them before attaining the skill level necessary for musical independence and satisfaction (Costa-Giomi et al., 2005).

Children, youth, and adults participate in music education in formal and informal learning practices (Green, 2017). The array of informal learning practices in music education has been growing in Slovenia. However, this research is focused on the Slovenian formal music education system, specifically for students between seven and 15 years of age. According to the report of the Republic of Slovenia Statistical Office (SURS (2014/2015), 2015), 20, 630 pupils were enrolled in the instrumental music education program in Slovenian music schools. In the previous school year (2013/2014), only 2, 788 pupils successfully finished the 1st or 2nd tier of their instrumental musical education in Slovenian music schools (SURS (2014/2015), n.d.). This steep dropout has yet to be researched in the context of the Slovenian music school system.

Slovenian music education system

A brief outline of the structure and history of the music education (instrumental and vocal) system in Slovenian schools is provided to explain the context to international readers:

The state of Slovenia provides two main types of music education for children and teenagers between the ages of 6 and 19: classroom music education and instrumental and vocal music education (Eurydice, 2024). Classroom music education occurs in elementary schools (children between the ages of 6 and 15) and several high school programs (students between the ages of 15 and 19).

At the elementary level, instrumental and vocal music education occurs in specialized music schools organized in a network of elementary music schools across Slovenia. Five music high schools are at the intermediate level, and one Academy of Music at the University of Ljubljana (AEC Music, 2017).

Slovenian music schools are integral to the European Music School Union (Rotar Pance, 2019; EMU, 2022; Hahn et al., 2024), representing a system with a 200-year-old tradition. This system, evolving significantly after Slovenian independence in 1991 (Rotar Pance, 2012), includes state-run music schools and government-approved private music schools, amounting to 54 public and 17 private institutions (Music Institutions Register, 2024). Slovenian music schools offer programs in music and dance education. In the following section, we focus on instrumental music education programs.

There are 27,161 music school students in the school year 2023/2024, which is 12.61% of the Slovenian school population. Most (84%) are elementary school students aged 7 to 15. There are 22,027 students enrolled in the MUSIC program – instrumental music education or singing (Ministry of Education, 2024).

The Music Schools Act of 2000, amended in 2006, and the related implementing regulation provide the legal framework for this education system, setting forth goals such as: "talent identification, personality development, improving the overall level of the education, and establishing a base of musical knowledge and experience to enable participation in amateur instrumental ensembles, orchestras, choirs, or dance groups" (Music Schools Act, 2000/2006; par. 2). Among other goals, it also prescribes supporting students' personal development per their abilities and the development principles.

The journey of individual instrumental education in Slovenia typically commences at the age of seven, although this may vary depending on the instrument. To enroll in instrumental classes, students must first pass a musical ability entrance exam, ensuring a certain level of proficiency. The curriculum is structured into two tiers: the 1st tier of instrumental music education spans 6 years, followed by the 2nd tier, which lasts 2 years.

The curriculum includes individual lessons on the chosen instrument, classroom theory or solfège classes, and a gradual introduction to ensemble playing and orchestra. In the first 3 years of study, the curriculum consists of two 30-min weekly individual lessons on the chosen instrument and one 45–60-min group theory or solfège lesson. In the 4th year, students of most instruments start to play in some form of ensemble setting (wind band, string orchestra, symphony orchestra, or choir singing). Over the course of 8 years, students are systematically assessed and graded in all music school subjects, including instrumental performance, theory, and ensemble participation, providing a comprehensive learning experience. The curricula are structured around specific learning outcomes as well as progressive learning outcomes. Such a structure should enable music teachers to provide the required differentiation for each student – especially in one-to-one individual instrumental instruction. However, there is no precise data on how this is carried out in everyday music school practice. The necessity of passing annual exams, except in the first grade, shows a systematic yet rigorous approach toward providing a high-quality foundation for instrumental music education.

Although the Slovenian music education system is very specific, there are some similarities with various international types of music education. In Slovenian music schools, children between the ages of 7 and 15 have instrumental music lessons in the form of individual instrumental instruction, internationally known as private studio instruction or one-to-one tuition. The theory and solfège lessons are held similarly to what is internationally known as music theory classes at the higher education level (university), while their ensemble lessons are similar to wind band or choir rehearsals held at schools.

Research on dropout in group and individual musical instrument instruction is presented from now on, as students in Slovenian music schools participate in both types of instrumental education. The age of participants in the following literature review corresponds with the age of Slovenian music school students – 7 to 15 years unless stated otherwise.

While there is a well-established body of literature on dropout in school band and orchestra programs, more research is needed in the context of private studio musical instrument individual teaching. Existing research on reasons for dropping out of instrumental music education discovers intertwining external and internal factors.

Research on dropout in school band and orchestra programs

Research on dropout in school band and orchestra programs finds the following main external dropout factors: other competing interests

and commitments (Cook, 2013; Hurley, 2021; Hash, 2022), logistical issues, including scheduling (Kinney, 2010; Busch et al., 2012; Cook, 2013; Hash, 2022) and issues associated with students' social environment. These include lack of support among peers (Cook, 2013), lack of parental support (Cook, 2013), inadequate parental or teacher support (Pitts et al., 2000), and family structure. There are higher levels of dropout among students from single-parent families (Kinney, 2010), and higher levels of mothers' expressed concerns about practice reflected in higher levels of their children dropping out from instrumental training (McPherson and Davidson, 2002). Socioeconomic status – the lower the SES, the higher the dropout rate is strongly associated with the dropout phenomenon in group music instruction (Corenblum and Marshall, 1998; Albert, 2006; Kinney, 2010; Busch et al., 2012).

Internal contributing factors toward dropout include academic achievement – students who struggle academically may be more prone to drop out (Gamin, 2005; Kinney, 2010); students' attitudes toward their musicianship – if students do not find personal satisfaction in instrumental music, they are more likely to drop out (Hash, 2022); unwillingness to spend time for instrument practice (Gamin, 2005; Cook, 2013) and loss of motivation (Busch et al., 2012).

Krause et al. (2020) examined reasons for dropping out of participation in musical activities among 190 Australian residents aged 17–75 years. In retrospect, the participants provided answers that can be placed in both previously presented categories: "access and opportunity" and "obligations" correspond with the external factors category, while "activity experience" and "difficulty with practice" correspond with the internal factors category.

Gerelus et al. (2017) point out that more than research focused on dropout with band and orchestra students may be needed to generalize findings to individual studio instruction, as later has its unique challenges, different from group instrumental teaching. Gerelus et al. (2017, p. 29) name factors such as »difficult solo repertoire, close teacher relationship, lack of social group aspect and a large extracurricular time commitment« as making private individual lessons different from group music teaching.

Research on dropout in individual instrumental instruction

Contexts of research on individual instrumental instruction slightly differ in each case. Therefore, each is presented in more detail. Costa-Giomi (2004) and Costa-Giomi et al. (2005) found behavioral differences among persisting and dropout piano students. Dropout students were less likely to have siblings, missed more lessons, practiced less, completed less piano homework, and achieved lower scores on piano exams than continuing students. They achieved less from the beginning of their studies than their continuing peers. Costa-Giomi (2004) identified lowered motivation and diminished achievement as early predictors of dropout behavior in piano students. In a subsequent study, Costa-Giomi et al. (2005) found that dropout students elicit more verbal cues from the teacher but get fewer praises from the piano teacher as they accomplish fewer assigned goals. Behavioral differences may help identify late but not early dropouts (Costa-Giomi et al., 2005).

King (2016) identified the primary reasons for dropping out of piano studio instruction. Predictors of musical ability, musical achievement, practice habits, and long-term commitment could accurately predict dropout but did not always impact motivation. Dropout students began lessons later in childhood, had less overall musical ability, weaker practice habits, and were progressing far more slowly than the continuing students. The main reasons for stopping lessons included lack of practice, preferring other instruments, and losing interest. The only predictor that impacted motivation was the quality of parental involvement. King (2016) reached an important conclusion about the connection between motivation and dropout; she found that dropout piano students were significantly less autonomously motivated than their persisting peers.

Gerelus et al. (2017) researched the role of *expertise* (musical ability, academic achievement, and musical achievement) and *environment* (social and educational status, gender differences, parental involvement, and home culture) in students' decisions to drop out of piano lessons. Dropout students reached significantly lower playing levels, despite taking lessons longer, had much higher instances of stay-at-home mothers, and fewer academic or professional mothers; in general, dropout group students' mothers were overall less educated than mothers of persisting students. Gerelus et al. (2017) describe dropout group parents' behavior as being overbearing and contributing to student dropout.

Gerelus et al. (2020) found significant differences in types of motivation between dropout and persisting piano students. Dropout students demonstrated less autonomous motivation and stronger amotivation. They started to play the piano later in their childhood than the persisting students and practiced less, although practicing was not necessarily related to motivation. The authors state that dropout students may have lacked competency, relatedness, and autonomy, which resulted in feelings of amotivation. They define a lack of competency as connected with dropping out. As in King's (2016) research, Gerelus et al. (2020) found parental involvement related to dropping out – parents sitting in lessons were negatively correlated with autonomous motivation, as parents may have overstepped their boundaries to interfere with the lesson setting. The level of autonomous motivation of dropout students was insufficient to sustain further music study. The authors state that the decision to drop out is connected to a lack of autonomous motivation.

Contributing external and internal factors to dropout are quite similar to those in the school band or orchestra settings, but there are some differences: in the internal factors category, piano dropout students had weaker long-term commitment, lower overall musical accomplishment, and musical ability. In the external factors category, they started playing piano later in their life, missed more lessons, were less likely to have siblings, and had higher instances of stay-at-home mothers who were overall less educated than mothers of continuing students (Costa-Giomi, 2004; King, 2016; Gerelus et al., 2017, 2020).

Loss of motivation is a recurring factor in relation to dropping out in both types of instrumental music education. Therefore, it requires further examination.

Motivation in music education

Motivation attributes between 12 and 27% of music achievement (Asmus, 2021), yet there is »a limited number of studies on children's motivation in the context of learning a musical instrument« (Oliveira et al., 2021, p. 105). "Providing an autonomy-supportive, musically

stimulating, and encouraging environment may prove more important than any predispositions to musical learning" (Blackwell and McPherson, 2022, p. 75).

Pitts et al. (2000) investigated the motivations and behavior of young instrumentalists in their first 20 months of learning. They compared motivation in students who ceased lessons and the ones who persevered. The complexity of musical learning is clearly shown in their research, as they describe the interplay of motivation, practice strategies, environment, and personality acting in proportions that authors find difficult to separate. Pitts et al. (2000) found that even the most motivated children had periods of self-doubt and required support from the teacher and parents. Authors suggest that students who lose motivation lack self-efficacy or external support and are especially susceptible to other negative influences. They point out that empathetic parental and teacher support is essential to progress, as is effective practice; they claim children ought to be taught and implemented (Pitts et al., 2000).

McPherson et al. (2012, p. 59) define »*demotive factors*« in the instrumental learning context: »serious short-comings about the quality of practice sessions, lack of parental support, significant antagonism around practice sites, boredom, an absence of personal engagement, limited learning autonomy over nearly all areas of learning, restrictive forms of music making and learning (i.e., the dominance of performance from notation and absence of other forms of performance like playing by ear and improvising), and, for many, very limited progress in terms of musical skill development in both instrumental/technical and notational/literacy areas« (McPherson et al., 2012, p. 59).

Inadequate teaching materials (Asmus, 2021), social comparison, normative grading criteria, public evaluation forms, ability self-assessment, and competitive musical environment (West, 2013) decrease motivation. McPherson et al. (2016) recognize many teaching practices undermining student autonomy and motivation in the classical master-apprentice lesson setting.

Self-determination theory as a theoretical framework for investigating music(de) motivation

Self-determination theory (Ryan and Deci, 2002) has received wide recognition in the context of instrumental music education research (Evans et al., 2012; Evans, 2015; Freer and Evans, 2018; Gerelus et al., 2020; Lee and Leung, 2020; Oliveira et al., 2021; Shaheen, 2022). Self-determination theory explains why an individual is motivated to engage in an activity or to stop engaging in it according to the satisfaction of three psychological needs: competence, relatedness, and autonomy. The need to feel competent is the desire to feel adequate and successful in acquiring and performing skills. The need for coherence is the desire to feel socially connected and integrated. The need for autonomy is the desire to feel self-determination and control over one's activity (Ryan and Deci, 2002).

From the perspective of self-determination theory (Deci and Ryan, 1985), children's motivational decline and eventual dropout occur when their psychological needs for autonomy, competence, and relatedness in their musical learning are »being thwarted« (Evans et al., 2012, p. 17). Evans (2015) suggests that rather than questioning how to motivate students, parents, and teachers should strive to create social environments in which their "students are more likely to generate their own interest, enjoyment, and motivation so that they can identify the value of musical practice, integrate it with their sense of self" (Evans, 2015, p. 78).

Music teachers

There is a duality of dimensions in music teachers, as they need to be both musicians and teachers. They must develop a professional identity and professional activity. During their studies, future music teachers are trained in their musical instrument mastery as well as in the field of pedagogy. The development of both identities is not parallel. Through the educational process of future music teachers, more emphasis is put on developing the identity of a musician/performer compared to the identity of a music teacher (Rotar Pance, 2019).

Blackwell & McPherson (2022, p. 72) outline 12 general principles for those »who provide instrumental and vocal lessons to children: » (1) everyone can benefit from music education, (2) start early, (3) immerse the child in other aspects of music, beyond learning to perform, (4) allow choice when selecting and choosing to change instruments, (5) consider the developmental appropriateness of the learning environment, (6) motivation is the key to success, (7) understand how students learn, (8) make the learning journey »visible« in order to foster a sense of musical identity, (9) do not use tests of music aptitude to determine who learns music, (10) design learning to minimize biases and stereotypes, (11) focus on the love of music and avoid external rewards, pressures, and controls; (12) develop a healthy state of mind through support, love, and encouragement».

As the teacher's role in individual musical instrument instruction dropout has yet to be researched in more detail, the existing research does provide some answers: music teachers point to two significant dropout factors in students: unwillingness to spend time practicing and poor academic performance (Gamin, 2005). Williams (2002) points to the complexity of students' motivation to continue or discontinue musical studies. Individual instrument teachers can detect early signs of students' motivation decreasing and intervene accordingly (Williams, 2002). He indicates that some parents allow their children to take full responsibility for their learning, while some students hold their teachers responsible for the outcomes of their lessons.

Davidson et al. (1998) researched music teachers' characteristics and the young instrumentalists' progress. Their study included 257 young people between the ages of eight and 18 who had received instruction on at least one musical instrument. They divided the participants into 5 groups. In Groups 1–4, there were active musicians – from highly successful to amateur. In Group 5, young ex-musicians are children who dropped out of music lessons. The students in Group 5 rated their instrumental teachers with »the least positive ratings« (Davidson et al., 1998, p. 149) in the following characteristics: friendly – unfriendly; relaxed to tense; chatty to quiet; encouraging to not encouraging; pusy to unpushy; good teacher to bad teacher and good player to bad player. The dropout students rated their last teachers lower in encouragement than all the other groups. They also rated their last teachers as significantly worse than any other group.

Hash (2022, p. 13) claims that »exactly how students' positive or negative feelings toward their instrumental music teachers affect retention remains unclear« and suggests that »almost all decisions made by instrumental teachers have the potential to influence student retention« (Hash, 2022, p. 39).

Dropout in the extracurricular activities

Similar to music activities, sports are popular after-school activities in many ways. In both fields, the dropout phenomenon of early cessation of activity is common. Roček et al. (2021, p. 72) state that "we still face a massive dropout of children from the sports, which is not replaced with an adequate alternative physical activity." Fraser-Thomas et al. (2016) and Woods and Butler (2021) state that 50–70% of youth participate in organized sports activities in Westernized nations. Still, around 35% of participants leave youth sports programs annually, and by the age of 13, there is an estimate that 70% of youth leave sports activities. This way, they are losing out on developmental and health benefits (Battaglia et al., 2024). Crane and Temple (2015) find five major areas contributing to dropout in sports among children and youth: lack of enjoyment, perceptions of competence, social pressures, competing priorities, and physical factors (maturation and injuries). Back et al. (2022) found that intrapersonal constructs related to motivation and sports experience had the strongest relationship with dropout.

Roček et al. (2021, p. 72) state that the consequences of dropping out of sports activities bring a range of personal, health, and social problems. While the impacts of instrumental music education dropout might not be as detrimental, Pitts and Robinson (2016) underline the important role of music education in laying the foundations for lifelong participation and providing all children with experience and understanding of making music.

In McPherson et al. (2012, p. 56) study in Australia, "three-quarters of the 104 surveyed adults had given up musical instrument playing, and negative views of their instrumental learning experiences were widely reported." There is a considerable variety in instrumental music education praxis worldwide. Therefore, dropout numbers are generally hard to obtain. Moreover, they cannot be easily compared. The existing data across countries, albeit at different points in time, show that dropout in instrumental music education is steep:

According to the AMA (2001), about 25% of Australian students drop out by age 12, with another 25% discontinuing by age 15, citing boredom, loss of interest, and little motivation as reasons for dropping out (StGeorge, 2006); in Serbia, 22% of students between the ages 7 and 12 leave their instrumental tuition in music schools within the first 2 years (Bogunović, 2010). The exact data on the percentage of students who drop out of Slovenian music schools in Slovenia has not been purposefully collected and cannot be obtained. However, the Republic of Slovenia Statistical Office (SURS (2014/2015), n.d.) reports the difference between the number of students enrolled in the 1st classes of the Slovenian music school MUSIC program (20, 630) and the number of students who successfully finished the MUSIC program in the previous school year (2, 788). These two numbers would suggest an 86.5% dropout from Slovenian music schools. However, this percentage must be tentatively interpreted, as there is no available data on the number of students enrolled in the 1st class in the 2008/2009 school year to obtain within one music school generation dropout percentage. Moreover, the number of available places in the 1st classes slightly varies yearly. From the available data we can conclude that the drop out is steep.

Aims of the study

The presented existing research provides valuable insights into the interplay of internal and external factors contributing to dropout in instrumental music education worldwide. The research on youth sports activities provides further understanding. However, no available data illuminates the interplay of internal and external factors in a systematic music education system such as Slovenian. No similar research has been done in Slovenia. The following study fills the gap in understanding contributing factors leading to dropout in Slovenian music schools.

The main aim of this study is to explore the contributing factors for dropout and motivational decline of music students aged 7 to 15 in Slovenian music schools. To systematically investigate these factors, the following general research question was formed: What are the perceived factors contributing to dropout in Slovenian elementary music schools, according to dropout students, their parents, music instrument teachers, music theory teachers, and school principals?

Method

A qualitative content analysis, as outlined by Dey (2005), was selected as the methodology to systematically investigate the factors influencing dropout rates among students in Slovenian elementary music schools. The analysis was conducted on data gathered from semi-structured focus groups, enabling the systematic examination of perceived dropout factors and identifying emergent themes.

Sample

The research was structured around five focus groups, consisting of (1) dropout music students who recently discontinued public music school, (2) the parents of these students, (3) instrument teachers, (4) music theory teachers, and (5) principals of elementary music school. A purposive sampling method (Patton, 1980) incorporating both quota sampling (which involves selecting participants to ensure the sample reflects certain characteristics of the broader population) based on predetermined inclusion and exclusion criteria and snowball sampling (which involves existing study participants referring future participants from their network, useful in accessing hard-to-reach populations) techniques, facilitated the selection of the participants. This approach ensured a diverse sample, capturing a broad spectrum of perspectives on the issue of student dropout. Information regarding the socio-demographic composition of the sample, such as age, gender, and musical instrument of study, was collected via a structured questionnaire.

Students (N = 6)

Inclusion criteria: (i) aged between 7 and 14 years, (ii) dropped out of a public music school in the last 2 years.

Exclusion criteria: lack of parental consent.

Parents (N = 6)

Inclusion criteria: parents of the children included in the study.

Instrument teachers (N = 6)

Inclusion criteria: (i) instrument teacher at a public music school, (ii) at least 1 year of experience in teaching an instrument at a public music school.

Exclusion criteria: (i) only one teacher per music school could be included, (i) only one teacher of the same instrument could be included in the focus group.

Music theory teachers (N = 6)

Inclusion criteria: music theory teacher at a public music school, at least 1 year of experience in teaching music theory at a public music school.

Exclusion criteria: only one music theory teacher per music school could be included.

Principals (N = 5)

Inclusion criteria: principal of a public music school.

The study included participants with diverse characteristics, including different gender, age, and, for students and instrument teachers, the variety of instruments played.

Procedures

Data collection was conducted in compliance with ethical standards, including the Helsinki Declaration and the Personal Data Protection Act. The research received ethical approval from the University of Maribor's Faculty of Arts Ethics Committee. Participation was voluntary, with participants being free to withdraw at any point, and informed consent was obtained through signed forms. To ensure anonymity, all identifiable information was removed from the data. Participants were assigned pseudonyms in all research documentation and analysis. Identifiable information, such as names or specific locations, was omitted or generalized in the transcription process.

The data analysis was conducted using a structured qualitative content analysis approach. Initially, audio recordings were transcribed, organized, and coded to identify statements pertinent to the research problem. An initial list of 52 codes was generated, reflecting a diverse range of responses related to the research question. Through a systematic process of refinement involving multiple rounds of analysis and discussion among the research team, these codes were examined for conceptual similarity and thematic relevance. This iterative process led to consolidating the initial codes into 9 distinct themes. A combination of inductive and deductive coding strategies was used. Theme identification was a two-step process: first, an open coding phase where themes were identified based on the data itself, and second, a reflective phase where these themes were considered in relation to prior theoretical constructs. The analysis was conducted in Atlas.ti and NVivo. The primary analyst conducted the coding and theme development, with periodic consultations with co-authors to validate the coding scheme and the interpretation of themes.

Results

The analysis of focus group data yielded nine themes categorizing the perceived factors contributing to student dropout in Slovenian music schools. These themes are divided into four internal and five external factors, providing a comprehensive overview of the influences on students' decisions to discontinue their music education. For detailed descriptions of each theme and associated codes, refer to Tables 1, 2 (Internal Factors) and Table 3 (External Factors).

Autonomy is affected when students engage in music education not out of personal interest but due to parental influence. The code *Learning music for parents' sake* indicates that at least two instances were noted where students' participation was more about fulfilling parental expectations rather than their own choice. One student said: "M*y mother persuaded me to give it a year [..]. She tried to convince me for another year, but I said no.*" This lack of personal choice is further complicated by a restrictive approach to learning, such as a limited repertoire where a student notes the gap between what is taught and personal interests, outlined by the instrument teacher: "*We have a gap between what is taught in music school and what they would like to learn.*" Students seek connections between their music education and the music they encounter daily, indicating a desire for relevant and relatable learning content. Several instrument teachers emphasized the problem of repertoire for technique development, with one of them stating: "*Students like scales and etudes the least.*" While necessary for skill advancement, focusing solely on technique can limit students' creative expression and choice, impacting their autonomy. One student pointed out that his dream music school would be the place where "*you could write your own notes with a magic wand.*" Several teachers and parents pointed out the importance of teachers' flexibility, with one of the instrument teachers stating: "*It seems to me that we have quite a big role to play. I know there have been many cases where I feel that the teachers have been a little bit too insistent in trying to accommodate the child, and that is because it is easier to get away with someone diligent, someone who practices, someone who is talented. Because, if you have an untalented child, who does not work, who is a little bit problematic, […] it takes a lot of your energy as a teacher, a lot of knowledge, a lot of patience, to get to a certain result, compared to having a student who you just tell to learn something at home, and he does it.*"

Competency concerns arise when students experience setbacks in competitions or perceive their abilities as inadequate. Musical competitions can be disheartening, especially if students feel they have failed to meet expectations, which can undermine their sense of competence, as noted by the instrument teacher's comment: "*One drop-out student was disappointed after the competition because expectations were higher, and he was very upset afterward.*" Furthermore, exams can also be a source of stress and may contribute to students' perceptions of diminished competence if they do not perform well. One of the instrument teachers highlighted that "*music school is demanding; that's a fact; it takes a lot of perseverance and patience for a very small result.*" Another instrumental teacher pointed out: "*Maybe when that leap happens, say in third, fourth grade, it gets harder and harder, then maybe they see that they just cannot handle the repertoire anymore.*" When asked what it would be that would make you like music school more to continue, the student said: "*Maybe the notes.*" One of the instrument teachers emphasized: "*I would put exams first [in terms of what they do not like]. They are a bit afraid of them, I would say.*" Students might perceive their abilities as inferior, which can discourage continued participation in music education. Comparisons to siblings who may be more musically inclined can create feelings of inadequacy. One parent described: "*So, obviously,*

10.3389/fpsyg.2024.1385840

TABLE 1 Sample characteristics.

Participant	Age	Gender	Instrument	Relationship
Student 1	10	Female	Piano	Child of parent 1
Student 2	11	Male	Percussion	Child of parent 2
Student 3	12	Female	Flute	Child of parent 3
Student 4	10	Female	Flute	Child of parent 4
Student 5	12	Female	Oboe	Child of parent 5
Student 6	13	Male	French horn	Child of parent 6
Parent 1	35	Female	/	Mother of student 1
Parent 2	48	Female	/	Mother of student 2
Parent 3	47	Female	/	Mother of student 3
Parent 4	39	Female	/	Mother of student 4
Parent 5	49	Female	/	Mother of student 5
Parent 6	61	Male	/	Father of student 6
Instrument teacher 1	49	Male	Trombone	/
Instrument teacher 2	49	Male	Violin	/
Instrument teacher 3	46	Female	Accordion	/
Instrument teacher 4	43	Female	Piano	/
Instrument teacher 5	31	Male	Percussion	/
Music theory teacher 1	54	Female	/	/
Music theory teacher 2	36	Male	/	/
Music theory teacher 3	48	Male	/	/
Music theory teacher 4	30	Female	/	/
Music theory teacher 5	48	Female	/	/
Music school principal 1	58	Male	/	/
Music school principal 2	46	Female	/	/
Music school principal 3	51	Female	/	/
Music school principal 4	53	Male	/	/
Music school principal 5	55	Female	/	/

she's more of a competitive type of person, and basically, at the beginning, she wanted to compare with her sister a little bit because the sister started going to music school." As students progress, increased difficulty may exacerbate feelings of incompetence, particularly if they are not adequately prepared, indicating that the perception of effort versus reward may influence their decision to continue. *Teacher: "I know of cases where students went to music school and then found out that they really had no [musical] talent.*"

In terms of **relatedness**, poor teacher-student relationships, limited peer relations, and lack of parental support were identified as key categories. Teacher-student relationship quality indicates the importance of positive relationships for student retention, where a lack of quality interaction can lead to dropout. Inflexible or impatient teaching can damage the relational bond necessary for student motivation, as outlined by a parent: *"She expected a bit more socializing, a bit more singing together. There was none of that.*" Poor teacher-student relationships reinforce the teacher-student dynamic's impact, with poor relationships contributing significantly to dropout rates. One parent said: *"I know that this relationship with the teacher is very important; to feel accepted.*" Parental support is also a key factor, as noted by the instrument teacher: *"Parents need to encourage and support students in a way that is kind to them.*" Group playing can enhance a sense of belonging, but negative experiences within these groups can also deter students. One of the parents pointed out: *"In fact, she was so bored that she would rather go dancing somewhere because there are other children there.*" Instrumental teacher emphasized students' affinity for music-making with others: *"I think that, at least for my instrument, they like chamber music and orchestra the best.*" Performance opportunities can strengthen relatedness, though, for some, it may also be a source of anxiety or a feeling of exclusion if not handled well. One of the instrument teachers emphasized: *"They feel good after a successful performance.*"

Lastly, **students' individual characteristics**, such as stage fright, musical instrument changes, and specific learning difficulties, point to personal challenges affecting their learning experience. One instrument teacher noted that "s*ome students have such a stage fright that they see they will not get through it and quit rather than suffer because they know what's coming.*" A parent commented, "*Because she was sick a lot, she was at home often. [..] Half the days she was sick, half the days she was at school. [..] So we said, let us leave it.*" On the other hand, another instrument teacher commented, *"Sometimes they might find that they have picked the wrong instrument [..]. We have quite a*

TABLE 2 Internal factors.

Theme	Category	Code (N of occurrences)
Autonomy	Limited repertoire choice autonomy	Reading music (4)
		Teachers' (lack of) flexibility (3)
		Musical pieces from popular music genres (3)
		Repertoire for technique development (3)
	Parent-initiated instrument learning	Learning music for parents' sake (2)
Competency	Underdeveloped musical abilities and skills	More demanding repertoire in the higher classes (6)
		Underdeveloped musical abilities (2)
		Comparison with siblings (1)
	Competitive setback and diminished competence perception	Reading music (4)
		Musical exams (2)
		Disappointment after the competition (2)
		Learning music requires a lot of effort to achieve results (2)
Relatedness	Poor teacher-student relationship	Flexibility of teachers, lack of patience (7)
		Poor teacher-student relationship (5)
		Teacher-student relationship quality (2)
	Limited peer relations	Playing in musical group (5)
		Remote learning (2)
		Teenage year specifics (1)
		Playing in musical concerts (1)
		Lack of social environment (1)
	Lack of parental support	Excessive strain on parents (1)
Individual differences	Health issues	Specific health issues (8)
	Learning difficulties	Specific learning difficulties (3)
	Instrument preference	Changing a musical instrument (2)
	Stage fright	Student's stage fright (2)

few cases where they dropped out, and then they realized they had chosen the wrong instrument." These categories highlight the profound effect of individual psychological factors on the learning process.

External factors

External factors focus on elements outside the student's immediate control, including teaching approaches, the social environment, curriculum content, resource availability, and overall workload.

The interpretation of external factors related to dropout from music schools in our sample reveals that the **teaching approach**, including the quality of teacher-parent and teacher-student relationships, significantly impacts student retention. Inadequate teacher-parent relationships can lead to misunderstandings or a lack of support for the student's musical journey, as a teacher indicated: *"Knowing to raise musical kids having no musical instrument at home."* This underscores the importance of a supportive network extending beyond the classroom. Adverse teacher-student relationships and insufficient student-centered teaching were also mentioned, highlighting the need for teachers to connect with students individually. One parent explained his view on his daughter's dropout from music school: *"Looking at my daughter when she stopped piano lessons after the third grade, it was mainly the relationship between the individual teacher and her that was to blame."*

Similarly, the **social environment** within schools is crucial, as a parent's remark, "*There was no socializing, so she found it boring*," reflects the need for a more engaging and interactive learning atmosphere, with the classroom dynamic crucial for maintaining student interest. The limited social interaction and opportunities, exacerbated by remote learning, challenge student engagement and enjoyment. One parent mentioned the lack of concerts as one of the factors for dropping out of music school: "*There were no concerts during the quarantine. There was no socializing.*"

Additionally, the **music school's curriculum** can serve as a deterrent if it does not align with students' interests or engage them creatively. An unappealing musical repertoire and overemphasizing musical literacy, such as music theory and solfège, rather than performance and creativity, can dampen enthusiasm. An instrument teacher highlighted musical theory and solfeggio as an important factor for dropping out of music education: *"My pupils have a thing against it. When moving from sixth to seventh grade, many would continue to learn a musical instrument, but they do not want to learn solfeggio anymore."* A music teacher commented, *"Repertoire should be different, not just a part of the music to be played [..] of course, is sort of compulsory."* Such feedback suggests that a

TABLE 3 External factors.

Theme	Category	Code
Teacher's approach	Adverse teacher-student relationship	Negative teacher-student relationship (6)
		Positive teacher-student relationship (3)
	Insufficient student-centered teaching	Teacher's competence in interpersonal relations (6)
		Individualized teaching (2)
	Inadequate teacher-parent relationship	Inadequate teacher-parent relationship (1)
Social environment	Unstimulative classroom atmosphere	Negative student-teacher relationship (6)
	Limited social interaction opportunities	Playing in musical group (5)
		Remote learning (3)
		Lack of concerts (2)
		Digital age (1)
Music school's curriculum	Music theory and solfége	Music theory and solfège (18)
	Unappealing musical repertoire	More demanding repertoire in the higher classes (7)
		Repertoire for technique development (3)
		Musical pieces from popular music genres (3)
	(Over)emphasis on musical literacy	Reading music (4)
Resources	Limited financial resources	Limited financial resources (2)
		Excessive strain on parents (1)
	Limited musical instrument access	Limited musical instrument access (1)
Workload	Competing extracurricular commitments	Competing extracurricular commitments (23)
	Raising academic demands in general education	Raising academic demands in general education (1)
	Excessive repertoire load	Excessive repertoire load (2)
	Pressure of musical instrument assessments	Pressure of musical instrument assessments (2)
	Parental support strain and logistics burden	Excessive strain on parents (1)

one-size-fits-all curriculum may not adequately serve students' diverse needs and interests.

Resource limitations, particularly financial constraints and lack of instrument access, also emerge as significant barriers. Teachers observe the difficulty in *"raising musical kids having no musical instrument at home,"* emphasizing the need for accessible resources for students to practice and improve.

Furthermore, the **workload** from the music school and general education demands can overwhelm students, as indicated by a teacher who notes the burden of *"music education [..] and they do have a lot at school."* The compounded pressures of academic and musical assessments and an excessive repertoire load may lead to stress and disengagement among students. One of the instrument teachers emphasized: *"There are lots of activities. Apart from primary school, music school is not the only activity in the afternoons, but there is one sport, another sport, there is a club, there are foreign languages, there is computing, there are class activities. It is exhausting, and then one thing has to fall away. Typically, this is the music school, which requires significant effort and time."*

Discussion

The primary objective of our research was to examine the contributing factors behind dropout rates and decreased motivation among music students aged 7 to 15 attending public music schools in Slovenia. No empirical study has been conducted to explore the key reasons for this phenomenon in Slovenia. Therefore, our study tried to bridge this gap. Furthermore, we aimed to explore the intertwining of external and internal factors that lead to dropouts from the perspective of students, their parents, music instrument teachers, music theory teachers, and school principals.

The discussion is structured around nine themes that emerged from thematic analysis, categorized into four internal and five external factors.

Among the **internal factors**, three align with the principles of self-determination theory (SDT) proposed by Deci and Ryan (1985). The most perceived factor for dropout was the lack of perceived autonomy, followed by the absence of feelings of competence and deficiency in relatedness. Additionally, individual differences such as health issues, learning difficulties, instrument preference, and stage fright emerged as the fourth internal factor influencing dropouts.

Several previous studies in the field of instrumental music education have drawn upon SDT to understand motivational dynamics (Evans et al., 2012; Evans, 2015; Freer and Evans, 2018; Gerelus et al., 2020; Lee and Leung, 2020; Oliveira et al., 2021; Shaheen, 2022). Evans (2015) highlighted the importance of situating music learning within a social context that fulfills fundamental psychological needs—competence, autonomy, and relatedness—closely linked to musical engagement and overall well-being. When students lack intrinsic motivation and the learning environment fails to support these psychological needs, dropout risk significantly

increases (Evans et al., 2012). Drawing insights from SDT, music educators can promote autonomous integration, leading to improved academic achievement and reduced dropout rates (Gerelus et al., 2020).

Autonomy emerged as a crucial internal factor influencing dropout rates, particularly when students engage in music education under parental influence rather than personal interest. Our results align with King's study (2016) and the research findings of Gerelus et al. (2020), which confirmed that dropout music students are significantly less autonomously motivated than their persisting peers. Interestingly, parental over-involvement in their child's music lesson setting may contribute to a lack of autonomy (Gerelus et al., 2020), especially if instrument learning is parent-initiated, as reported in our results. Parent-initiated music learning, which can result in parental pressure on children, may lead to increased stress levels in children learning music, ultimately hindering their progress and enjoyment of the activity (McPherson et al., 2012). The key lies in finding the right balance between encouraging a child's learning of musical instruments—where active parental involvement is crucial for a child's success in the musical domain—and simultaneously allowing the child autonomy as a parent without exerting excessive control. Autonomy is particularly important because it affects students' self-efficacy and well-being. McPherson and McCormick (2006) found that self-regulation, which includes aspects of autonomy, positively influences self-efficacy in young musicians. Another study by Creech and Hallam (2011) explored the role of autonomy-supportive teaching practices in enhancing self-efficacy beliefs in music students. They found that teachers who encouraged students to take ownership of their learning process and provided opportunities for self-directed practice and exploration fostered higher levels of self-efficacy among their students.

When students feel empowered to make choices about their musical learning and expression, it can positively impact their overall well-being. For example, a Bonneville-Roussy et al. (2020) study reported that teachers' autonomy-supportive behaviors were related to students' well-being, whereas controlling behaviors hindered well-being. The lack of autonomy is further exacerbated by limited repertoire choices and a perceived gap between taught content and personal musical preferences. Repertoire is the most motivational tool for starting to play an instrument, and the pieces play a significant role in progress (Feschanka, 2021). Therefore, one of the main motivational strategies in instrumental teaching is to provide music students with the autonomy to select between several musical pieces.

Teachers' lack of flexibility was reported to be an important demotivator in the music learning process. The desire for relevant and relatable learning content is evident among students, emphasizing the importance of aligning the curriculum with their interests for enhanced engagement. As outlined by Šimunovič and Habe (2024), musical genre diversity contributes to the motivation of young musicians highlighting the need for supportive environments that foster positive self-perception and motivation. The latter is aligned with the research findings of Bernabé-Valero et al. (2019), which highlight the importance of effort in sustaining motivation in music students, including perceptions about one's own skills, satisfaction with achievements, effort, the importance of music in one's life, and perception of the sacrifice made.

Competency concerns stemming from setbacks in competitions, exams, and comparisons with more musically inclined siblings contribute to diminished competence perceptions. The perception of underdeveloped musical abilities and skills among music students highlights the multifaceted nature of competency in music education. Our study identifies the challenge posed by a more demanding repertoire in higher classes. This aligns with previous research indicating that the complexity and difficulty of musical pieces can impact students' perceptions of their own abilities (Sosniak, 1985). Issues such as difficulties in reading music and performance anxiety during musical exams that emerged in our study can undermine students' confidence in their musical abilities (McPherson and McCormick, 2006). Several previous studies involved competency in exploring (a)motivation in music activities engagement (Costa-Giomi, 2004; Costa-Giomi et al., 2005; StGeorge, 2006; King, 2016; Gerelus et al., 2017, 2020). The previous findings suggest that the lack of competency, such as less overall musical ability and musical achievement (Gerelus et al., 2017, 2020), contributes significantly to the attrition from music schooling. The perception of effort versus reward plays a role in students' decisions to continue.

Relatedness factors, encompassing poor teacher-student relationships, limited peer interactions, and lack of parental support, significantly impact dropout rates. As prior studies have indicated, a psychological requirement crucial for individuals' continued engagement with music is the need for relatedness (Oliveira et al., 2021). Music facilitates establishing social connections among individuals with similar musical interests (McPherson et al., 2012). Previous research confirms that satisfaction of the need for relatedness is one of the most significant factors influencing the quality of motivation in the music school context (Evans et al., 2012; Tucker, 2020; de Bruin, 2021).

Our results reveal that positive teacher-student relationships and parental encouragement emerge as essential for student retention. These findings corroborate with Creech and Hallam (2011), who investigated the influence of student-teacher and student-parent dynamics on various aspects such as self-esteem, self-efficacy, motivation, enjoyment of music, musical achievement, and satisfaction with lessons. Their findings revealed that reluctance in student-teacher interaction negatively impacts several motivational factors, including enjoyment of music, satisfaction with music lessons, motivation, and self-esteem. Moreover, a positive student-teacher relationship can also foster or promote autonomy (Küpers et al., 2014; Comeau et al., 2015). Regarding the importance of parental support, previous findings suggest that openness to parental support demonstrates a positive correlation with all motivational aspects (enjoyment of music, satisfaction with instrumental lessons, motivation, self-efficacy, and self-esteem), except for musical achievement, suggesting a potential hindrance to musical progress through parental support.

Group activities and performance opportunities can strengthen the sense of relatedness. However, negative experiences with them may lead to anxiety or feelings of exclusion. Burnard and Dragovic (2015) outlined that collaborative creativity in instrumental group music learning is a site for enhancing music students' well-being. The thrill of performing in front of an audience, especially when performing in a group, can help maintain the motivation to engage in music performance activities (Lowe, 2012). Anticipated public performances are strong incentives for musicians to engage in

practice (Hallam, 1997; Woody, 2001; Burwell and Shipton, 2011). However, performing solo can also be a huge demotivator and sometimes even a reason for attrition from a music school. Additionally, if a music student does not feel connected with the group he is performing with or does not share performing goals with the other group members, he can experience significant frustration and distress.

Students' individual differences, such as stage fright, instrument preference changes, health issues, and learning difficulties, underscore the profound influence of personal challenges on the learning process. These factors highlight the importance of recognizing and addressing individual needs to support students effectively. Stage fright is reported to be one of the main stressors in the life of young musicians. Research suggests that high levels of music performance anxiety can lead to decreased motivation and ultimately contribute to dropout rates among music students (Habe and Kržič, 2017). Factors such as fear of judgment, self-doubt, and pressure to perform flawlessly can exacerbate performance anxiety, leading to negative outcomes in music education. Understanding and addressing the root causes of music performance anxiety are crucial for creating supportive learning environments that foster students' long-term engagement and success in music education.

External factors, including the teacher's approach, social environment, music school curriculum, resources, and workload, also contribute to dropout rates. Inadequate teacher-parent relationships and adverse teacher-student relationships emphasize the need for supportive networks beyond the classroom. The social environment, curriculum alignment with students' interests, and accessible resources play pivotal roles in student engagement.

An unsupportive teacher's approach, including inadequate teacher-parent relationships, adverse teacher-student relationships, and insufficient student-centered teaching, emerged as one of the reasons for attrition. Particularly negative teacher-student relationships and a lack of teachers' competence in interpersonal relations were highlighted. As Hansen and Imse (2016) stated, student-centered teaching practices incentivize 21st-century skills in music education. With the teacher as facilitator, young musicians are prompted to self-reflect, evaluate their peers, and problem-solve regarding music-making and creation.

A ***non-stimulative*** classroom atmosphere and limited social interaction opportunities emerged as categories regarding the ***social environment***. In our opinion, the latter still reflects the consequences of the coronavirus pandemic (Šimunovič, 2020), when remote learning, lack of concerts, and the absence of group play were crucial reasons for music pupils' demotivation.

The greatest reported challenges regarding the ***music school curriculum*** are music theory and solfege. Many young pupils struggle with these subjects and fail to see their practical value. Therefore, cross-curricular connections in music schools are very important (Gruden, 2019). Unappealing music repertoire, including pieces for technique development, a lack of musical pieces from popular music genres, and especially highly demanding repertoire, was also reported as a reason for music pupils' attrition. Lowe (2012) reports that music pupils in their study expressed a preference for regularly changing repertoire, favoring faster, rhythmic, and memorable music. Thus, instrument instructors are urged to select repertoire with these motivational attributes and regularly vary the repertoire to sustain student interest when feasible. Additionally, providing students with some degree of choice in repertoire may foster feelings of autonomy and independence.

Resource limitations, particularly financial constraints and lack of instrument access emerge as significant barriers to music education. The study emphasizes the need for accessible resources to ensure students can practice and improve effectively. Our results align with previous findings reporting socioeconomic status as an important predictor of motivation for engaging in music activities (Hoffman, 2013; Jeppsson and Lindgren, 2018).

The ***workload from music schools and general education demands*** presents a potential source of stress and disengagement. Balancing academic and musical assessments and an excessive repertoire load requires careful consideration to prevent overwhelming students. Riley (2016) reports that academic overload and extracurricular overload can contribute to burnout in young musicians.

Based on the formulated themes categorized into internal and external factors, we can observe that many themes intertwine and can be found among both sets of factors. This can be observed in themes such as music repertoire, which emerged in internal factors under lack of autonomy, and external factors under music schools' curriculum. Additionally, the teacher-student relationship emerged as an internal factor under lack of relatedness and as an external factor under the teacher's approach. The intertwining could also be observed between the social environment, a theme that emerged in external factors, and relatedness, formed as an internal factors theme.

As revealed in our thematic analysis, the intertwining of internal and external factors is consistent with previous research findings, which have shown that internal and external factors are constantly connected and influence each other (Rotar Pance, 2006).

Conclusion

In conclusion, our study provides valuable insights into the multifaceted factors contributing to dropout rates in Slovene public music schools. The findings underscore the need for a holistic approach, addressing both internal and external elements, to create supportive environments that foster autonomy, competency, and relatedness and accommodate individual characteristics. As Alessandri et al. (2020) suggest, institutions need to embed health and well-being into a "living curriculum" to accommodate the needs of different students. Implementing these insights may contribute to reducing dropout rates and enhancing students' overall music education experience.

Lastly, it is important to highlight that this is the first systematic empirical study in Slovenian music education focusing on the current challenges of finding solutions to maintain learning motivation and reduce dropout rates in the music school environment. The study will serve as a foundation for conducting quantitative research, the results of which will provide a clearer picture of the vision for the future development of Slovenian music education.

By addressing the factors identified in our study, particularly those rooted in SDT, music educators and policymakers can design interventions and create environments that foster students'

autonomy, competence, and relatedness. This holistic approach is crucial for nurturing intrinsic motivation, enhancing musical engagement, and ultimately reducing dropout rates in music education settings.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Maribor's Faculty of Arts Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

AK: Writing – original draft, Writing – review & editing. KH: Writing – original draft, Writing – review & editing. BR: Writing – original draft, Writing – review & editing. ML: Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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frontiers | Frontiers in Education

TYPE Methods
PUBLISHED 21 June 2024
DOI 10.3389/feduc.2024.1372142

OPEN ACCESS

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RECEIVED 17 January 2024
ACCEPTED 10 June 2024
PUBLISHED 21 June 2024

CITATION
Satka F and Garneva E (2024) Model of motivational competence: creation of students' motivation, assessment, and research.
Front. Educ. 9:1372142.
doi: 10.3389/feduc.2024.1372142

Model of motivational competence: creation of students' motivation, assessment, and research

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The basic finding uniting the researchers is that motivation is the weakest educational component, which prompted us to create and suggest a practical *model of motivational competence.* The project is based on the researchers' descriptions of students' motivational leading variables. Our main finding is lack of a value system and moral virtues in the foundation of motivation. The constructive components of the model *cognition*, *cogitation,* and *skills* were built on that basis. The main functional approaches in the study with the model are *communication, feedback,* and *critical thinking*. The model aims: (1) to direct teachers in creating and maintaining students' motivation through motivational competence based on human values and virtues and (2) to strongly recommend that educational policies must pinpoint a *value system* and *moral criteria* for schools and universities so that educators can rigorously develop them in students through motivation. The contributions of the model are: (1) it is based on the crucial need for a strong value system and moral virtues in the foundation of students' motivation and behavior; (2) it is bidirectional—developing students' motivational competence, in parallel it increases teachers' motivational competencies; (3) it argues that motivational competence must be the professional imperative leading to the curriculum purposes of teaching–learning process on the foundation of competence, high spiritual qualities, and morality.

KEYWORDS

model, motivational competence, feedback, cogitation, morality, spirituality

1 Introduction

The rationale of this project is that the issue of motivational competence measured upon society is an adequate frame to describe the degree of success in any life practice. That premises the role of motivational competence as a significant factor in the development of responsibility and accountability of education. The concern is that motivation has waned in effectiveness over recent decades and become the weakest educational component. School teachers encounter difficulties in engaging students in the classwork and are helpless to encourage them with the homework. University lecturers generally accept that students are naturally motivated due to their intrinsic desire to study a speciality as a future profession. However, this is less likely to be the general case of motivation. The decrease in motivation in many countries worldwide is more likely because the applied motivational

methods and approaches do not have sufficiently encompassing expediency at their core, which necessitates education in motivational competence and motivational approaches to be laid on a new converting basis through the perspective of human spiritual development.

We summarized the motivation variables in the research study (see Section 2) and classified them into three groups, namely, lacks, obstacles, and needs. Our main finding is the *lack* of a *value system* and *moral criteria* at the core of the motivation structure. Although, there are scientists who marked this issue [Han, 2015; Kristjánsson, 2021, etc. see subsections 2.3. and 3.4.]. To overcome the shortage of strictly necessary spiritual values and virtues nowadays, MMC suggests ideas for strategic *communication, feedback,* and *critical thinking* as functional approaches (see subsections 3.1, 3.2, and 3.3).

The model depends on the methodological validity of the studies and the resources used. Considering the broad perspective of motivation, the *purpose* of the model is to assist educators in gradually increasing learners' motivational competence in the direction of human value system and moral criteria. They can create and support students' motivation in decision-making and subsequent behavior based on values and virtues. The model functions in any educational setting from pre-school to tertiary levels of education. Referring to the vital human values and virtues, for meeting students' needs and achieving the curriculum purposes, it will provide a good foundation for the further flourishing of morality. Hence, the main *tasks* of the model are to fill the gap of values and virtues in the motivational character through:

- Infusion of human values and moral virtues in students' motivational competence for substantiation and inciting to spiritual evolution;
- Gradually teaching motivational competence on the foundation of a value system and moral virtues;
- Fast acquisition of values and virtues and using them in the motivation arguments;
- Development of students' motivation skills in the motivation argumentation;
- Maintaining the achieved motivation level and upgrading it;
- Simultaneously, the model develops educators' attention to the value system and moral criteria in the essence of motivation argumentation during teaching.

Hereof, the highlighted question is: "How can teachers engage students in learning and create and maintain their motivation for achieving curriculum purposes, premised on a value system, and moral criteria through critical thinking?" In brief, the MMC gives educators' information about the valuable constructs of motivational competence. The model derives knowledge through communication—interpersonal, individuality-oriented, and emotionally dynamic; integrates elements of students'/educator's cognition, cogitation, skills, and behavioral systems; directs critical thinking at values and virtues to fulfill the learning objective. The model brings these ideas together through a set of open-ended questions and directs the subsequent answers and arguments to a moral- and value-based educational purpose. The extent to which the model is operationally defined, and can be utilized and evaluated, is across all stages of education—from kindergarten to tertiary levels.

2 Theoretical foundations covered

The creation of the Model of Motivational Competence (MMC) is *literature-based* and is restricted to motivation learning theories and articles that researched multiple motivation variables in education through the perspectives of those theories.

2.1 Motivation learning theories

We applied a comprehensive approach to generalize the findings on motivation for learning from the perspective of *motivation learning theories* and practices. Gopalan et al. (2017), Al-Harthy (2016), Schunk et al. (2020), Schunk et al. (2020), Weiner (1985), Elliot and Dweck (2005, 2017), and Lai (2011) have provided broad literature reviews of motivation theories and motivation. All theories group under this name a substantial number of variables characterizing various aspects, ideas, and conceptions. Weiner's (1985) attributional theory of achievement motivation is one of the recent theories which has been followed by numerous researchers.

What expands the issue of motivation are many studies on multiple aspects of motivation learning theories for achievement motivation: achievement goal theory (Pintrich, 2000), expectancy-value theory (Wigfield and Eccles, 2000), and the role of self-determination theory in understanding the educational process (Ryan and Deci, 2000, 2018; Bieg et al., 2011; Ten Cate et al., 2011; Deci and Ryan, 2012; Reeve and Su, 2014). Schunk (1991), Zimmerman (2000a), and Artino (2012) emphasize the significance of self-efficacy in fostering motivation for learning. Pajares (2008) integrates both perspectives by acknowledging the motivational influence of self-efficacy and advocating for self-regulated learning. Other researchers, such as Artino et al. (2012) and Lahey (2016), predicate their ideas on the control-value theory and the role of emotion for motivation or as Broussard and Garrison (2009), Eccles (2005), and Steinmayr et al. (2019) predicate on achievement-related choices, as Eccles underlines psychologically measured "subjective task value."

Elliot and Dweck's (2005) concept of "competence as the core of achievement motivation" is essential to our model. The same authors (2017) illuminated the "competence" wider as the "conceptual core of the achievement motivation literature," which involves a shift in terminology "from *achievement motivation* to *competence motivation*" (p. 3). They wrote about some factors' impact on achievement motivation such as "competence acquisition (learning goals)" and "competence validation (performance goals)" (p. 135). We consider Elliot and Dweck's term "competence motivation" important to general competence in education. However, we establish our concept of "motivational competence" (MC) as a single aspect of "competence motivation." Our concept includes a particular content regarding a level, quality, and scope of knowledge in terms of motivation. Therefore, we called our project Model of Motivational Competence. In other words, MC acts in the interactive field of general cognition (Cgn), collecting knowledge of motivation, and here the impact of mindsets on competence is an important factor (Dweck and Molden, 2017). The valuable constructs of MC are presented in Section 4. The MMC's Structural Composite Parts.

2.2 Social cognitive perspective

Generally, society, unnoticedly or overt, always fosters one's motivation, and in turn, the motivation effect is reflected in society in the short- or long-term period. Respectively, some authors trace the problem of motivation from the social viewpoint. Zimmerman (2000b) examines motivation within the framework of self-regulation theory from a social-cognitive perspective. Others research the triad "school-students-teachers. Ferreira et al. (2011) consider the social aspect of school as a motivational variable and state that "a positive sense of school belonging may improve students' academic motivation" (p. 1713). Boström and Bostedt (2020) consider students' and teachers' perspectives on motivation; Schlosser (1992) researches the correlation between teacher distance and student disengagement, which influences motivation; Turner (1995) shows the influence of classroom contexts on motivation which is a specific social setting. From the contemporary standpoint of motivation for learning and performance, Keller's (2010) ARCS model approach (Attention, Relevance, Confidence, and Satisfaction) is useful and helps work on students' motivation individually aimed at achievement and psychological support.

Social aspects of motivation are becoming crucial rapidly since the geopolitical situation is becoming increasingly dangerous, and European countries and mankind are threatened with war. In these conditions, the increasing prevalence of the phenomena of "moral disengagement" has substantial social significance. Chugh et al.'s (2014) "withstanding moral disengagement" is not only alarming but ominous as social behavior (McCreary, 2012) and evil for society (Brendel and Hankerson, 2022). Psychologists are concerned about business ethics in parallel with that phenomenon (Schaefer and Bouwmeester, 2020), and sociologists are concerned about behavior in the workplace organizational practices for social justice (Rashkova et al., 2023). This proves the importance of the connection between the social and moral aspects of motivation.

2.3 Moral aspects in the research studies

In the last decades, *moral education* has appeared to be an interdisciplinary section of education science bound to positive psychology, psychology of education, moral philosophy, and virtue ethics. Tangney et al. (2007) researched moral emotions such as shame, guilt, and embarrassment, and how they influence the link between moral standards and moral behavior, which confirms the idea that moral education should start with preschool education because of the collapse of traditional moral values and the degradation of moral virtues that we have all witnessed in recent decades. Ljubetić (2012) wrote about "reigning—valuelessness and disorientation" (p. 82), Damon (1990) suggested how to nurture the growth of a "moral child," and Krettenauer et al. (2013) developed the idea of the relationship between moral emotions and the development of the moral self in childhood. Accepting purpose as a moral virtue for flourishing, Han (2015) wrote what could inspire moral education is 'the developmental goal of moral education aiming at flourishing' (p. 6). Kristjánsson (2021) reasons about the present and future of moral education and is concerned about "a balance of virtues within a life ordered according to a 'golden mean'" (p. 119). Hamby (2014), looking at the issue from a different perspective, shared an important view regarding critical thinkers' moral virtues.

We consider for a good start authors' research where they posed the issue of morality in education. However, researchers do not set the value system and the moral criteria as an evolutionary foundation of motivation and for educational system development. We devoted the subsection 3.4. *Morality at the core of motivation* to this issue. We highlight the placement of the value system and moral coordinates as an approach to MC because they lead to humanizing and moralizing the trend of cognition and cogitation in education as a prerequisite for well-motivated behavior, which widens the scope of the main contribution of the model, and some essential arguments support it.

We broadly summarized motivation learning theories and practices and their social and moral aspects in the literature above (and References). However, we could not single out those criteria in the canvas of the research study which set generally valid coordinates to unite learners in motivation (albeit through the perspective of different theories). Shortage fostered us to infuse the pursuit of universal human values and moral virtues into the core of motivation. Human values and virtues are the parameters setting the coordinates of a generally valid value system and unitive moral criteria. Awareness, focused on values and virtues, enables individuals to draw reasonable, substantiated, and justified inferences. In view of this, our MMC firmly emphasizes the value system and moral criteria as a vital functional component in the motivation canvas. As valuable coordinates, they will *humanize the direction* of cognition (Cgn) and cogitation (Cgt), which is needed for education to achieve.

Why Cgn and Cgt must have a moral and humanizing direction in education? First, knowledge (Cgn) is a prerequisite in the foundation of any development—educational, individual, spiritual, physical, cultural, esthetical, social, political, and religious. Second, through knowledge, mankind can develop reasoning faculties (Cgt) and expand their reasoning capacity and can evolve. Third, knowledge and reasoning faculties are fundamental constituents of the model which can be naturally saturated with human values and moral virtues throughout education. Furthermore, they give coordinates, through which a human being will or will not be placed in the correct sector of the coordinate system of mankind's evolutionary development.

Consequently, the value system and moral virtues must be taught at all educational levels. This is a pressing need for the education of the generation. Therefore, educational policies ought to define their emergent priorities for humanizing the trend of cognition; not to make changes based on which lies the insidious idea of hybridization (between AI-artificial intelligence and OI-original intelligence), and hence, dehumanization. The latter processes are proceeding in a gradual, subtle way but with much more harmful and long-term effects. Through a variety of means, good education policies can help the next generations grow up morally with a strong value system. Education in morals and virtues is available to the powerless in the fight against the powerful.

The above information in Section 2 and its subsections is a compelling premise that our idea of motivational competence, based on a value coordinate system and moral criteria, deserves special attention in the teaching–learning process at all educational levels. Additionally, Meece et al. (2006) noted a direct relationship between classroom goal structure, student motivation, and academic achievement. We agree and insist that such a relationship builds educational success and the morality

of adolescents and the young generation, as well as motivated behavior in life. Therefore, values and virtues ought to be embodied in the purpose structure through expedient communication, productive feedback, and effective critical thinking, acting to achieve the goal. The new in MMC is that it can develop the moral aspect of education by appealing to values and moral virtues in the purpose structure. It can cultivate morality through value motivation, willpower, self-regulation, and self-expression only on the right track. The process comprehends kindergarten (Ljubetić, 2012) and motivation in primary, secondary, and higher school and at tertiary levels of education (Schunk, 1991; Steinmayr et al., 2019; Schunk et al., 2020, etc.), which is obligatory because the fight against "reigning valuelessness," in other words, against degenerate-depraved-perverted "values" nowadays, begins even before birth.

3 Methods and approaches

For this literature-based research, we applied a set of methods and approaches. Initially, we applied the *literary research method* to 47 articles on motivation in education—26 about motivation in school and 21 about motivation in university. Then, we used the methods of *analysis* and *synthesis* of the key variables of motivation presented by the researchers in their findings. By the *method of summary*, we excerpted the most significant variables for students' motivation and classified them into main three groups of variables, namely, lacks, obstacles, and needs. The picture of the model was built by applying the *relational approach* that investigates the relationships between the four composite parts of the model (see Section 4. The MMC's Structural Composite Parts), which potentially contain those variables. The *description method* and *function analysis method* were utilized to elucidate the three composite parts, namely, Cgn, skills (Sk), and Cgt as a special reasoning ability. The purpose (P) of a learning setting is the main goal of the model's function. Everything is depicted, described, and explained in Figures 1–5 in Section 4.

In summary, the important conceptual trend of MMC is a *recovery of morality* in education (school and university) as a personal and public value. The argument is that the present, strained by armed events in Europe and worldwide recently, is in danger of war. Contemporary geopolitical events impinge on the sociopolitical variables and morality of every country. We are witnessing vandalism, aggression, and murder of students and teachers by teenagers and young men. Those factors and the variety of national sociocultural and socioeducational traditions, religions, the role of social media on mental health, specific local, and individual features logically predetermine the issue of morality in education, hence in motivation, to be viewed in a *holistic context*. For the reasons above, and because education is the moral corrective of society, it is mandatory to make a deeper *humanization* of education in the sense of human existence based on human values and the spirituality and morality which define and distinguish mankind. The contribution of our model is in four aspects: (1) the need for education to address the spiritual essence of the human being, (2) the function of education as upbringing must be based on a value system and moral criteria, (3) the need for goal-setting of values and virtues in the roots of motivation and at the core of the learning purpose, and (4) the new generation of 21st century needs to be educated to think humanely and generate decisions through the perspective of spiritual evolution.

The implementation of the model in teaching practices requires expedient scientific approaches. The theory and practice of the *competency-based approach*, extended at the beginning of the XXI century and presented by Makulova et al. (2015), aim to find out one's core competence. The core competence in our model is motivational competence (MC). Readiness to work with that special knowledge for a given purpose (P) requires a certain level of reasoning faculties (Cgt), as well as the teacher's skills (Sk) such as language use, strategies use, intonation, body language, personal manners of influence, awareness, and confidence. Additionally, to build motivational competence following the model, educators need to use three essential functional approaches, which are the main success determinants of MMC: *expedient communication, productive feedback*, and *effective critical thinking,* respectively, presented in Sections 3.1, 3.2, and 3.3. They aim to generate appropriate human values and moral virtues in the motivation purpose structure, in the possible student's choice and behavior due to their social and cultural contextual factors.

3.1 Expedient communication

Generally, it is necessary to employ a *communication-based approach* to the learning process (Hovland, 2005; Richards, 2006; Hunt, 2007) through questions, respectively, the main lacks, obstacles and needs to be found out, expounded on and interpreted properly. Hunt's report (2007) provided evidence from all over the world of the role of communications in education, their successfulness and weaknesses and underlined the importance of "prioritizing communications" for development principles and methodologies in all problematic areas (p. 2). His idea emphasized the need for communication to be expanded with the involvement of parents' opinions (p. 30). Richards (2006) underlined that one important aspect of knowledge is "knowing how to maintain communication" despite having limitations (p. 3). Hovland (2005) considered the issue of a successful communicative toolkit for researchers. Those viewpoints support the MMC's idea that motivational competence requires educators to manifest good communicative competence and communicative skills in their relationships with learners and, in particular, with school students' parents.

In research of numerous sources, Morreale et al. (2000) gave evidence of the importance of communication education. As Morreale and Pearson (2008) later asserted, communication instruction is a "pressing need" at all levels of the educational system in the USA. They summarized four major themes supporting the importance of communication education: (1) the development of the whole person, (2) the improvement of the educational enterprise, (3) being a responsible participant in the world, both socially and culturally, and (4) succeeding in one's career and the business enterprise (p. 225). Additionally, the fifth theme in the 2000 study highlighted the need for communication education provided by specialists. The authors concluded that competence in oral communication is "a prerequisite to academic, personal, and professional success" (*ibid*). Importantly, the authors underlined that one can have "the ability to vocalize"; however, it cannot be a condition for "a full accoutrement of the knowledge, attitudes, and skills" (p. 225) that constitute communication competence, which unequivocally illuminates MMC's assertion of the glaring need for achieving a higher level of communicative competence and communicative skills in education. It raises the idea that communication education to be included in the

school curriculums where there is a gap, which can support education in a valuable worldview.

The study of communication can be from different points of view and aspects: due to the participators' communicative traits, e.g., students' (Martin and Myers, 2006), or the influence of the instructor's in-class communicative behaviors on the student's participation in out-of-class communication (Myers et al., 2005); the importance of the processes of listening (McCracken, 2006), speaking, understanding, reasoning, as well as the quality of communication such as clarity, caution when analyzing, persuasiveness, comprehensiveness, etc. Keeping in mind that communicative competence starts developing from the kindergarten educational level, goes through all educational levels, and continues during the lifetime, which underlines the all-pervasive educator's influence on learners in the communicative process.

What aspects of communication do the model develop? In the MMC, the concept of *expedient communication* was formed for several reasons. First of all, in broad outline, communication is a sharing of interests. Due to our model, communication is expedient because educators focus on human values and virtues (their interest in upbringing), and simultaneously, their focus is on the individual's needs for self-expression and self-realization (his/her interests). Second, communication operates in an individual's Cgn, Cgt, and Sk fields. It makes the process of finding the expedient questions to motivate the student easier, faster, and more productive. Third, expedient communication may derive the values and virtues from the task, the subject, or the curriculum purpose. Finally, when a teacher works on students' MC, communication is not just a smart dialog—teaching information on motivation and receiving students' feedback on how information is reflected. On the contrary, communication as an expedient approach directs the received information to spiritual values through psychological attitudes, inclinations, and intrinsic needs.

Moreover, the concept of expedient communication is used and applied as a *key functional approach* due to three of the functional spheres of interrelationships—education, administration, and social sphere: (1) in education—to state explicitly that communication lacks the essential and much-needed topic on issues of value system and moral criteria in the learning process; (2) in administration: we insist that the value system and the moral criteria must be institutionalized, implemented, and consolidated in education by educational policies at all stages of education administration; and (3) in the social sphere: the recovery of morality, through a thorough study the discipline of Ethics and the spiritual upbringing in education, will have an impact on society to make a progress in the morality and the spirituality in the long-term. Otherwise, as Jansen (2002) shows beyond doubt, we will witness "political symbolism as policy craft" to explain the insignificant efforts in the implementation.

Additionally, applied to the MMC, this communication is motivational with value-laden and virtue-directed content, emanating from curriculum purposes and an individual's needs. Finally, all those content elements are managed through the instructor's communicative skills, motivational competence level, and high-value system level.

After identifying an individual's level of MC, the teacher should use it properly. As already explained, data are collected through questions over the three substantial variables: lacks, obstacles, and needs. Teachers can develop learner-centered approaches to motivate an individual with moral virtues toward a given P. The P is the reached vitality of the impulse. The nature of an impulse reflects the motivational sense of the impulse giver. The impulse giver should interpret those MC elements which are compatible with the concrete individuality and incite activity toward the P. Concurrently, the teacher should not forget to extract the relevant moral values from the P in advance.

The pursued results of the expedient communication as a functional approach in the learning process are:

- To ensure quick and effective communication on learning issues;
- To provoke self-knowledge, self-esteem, and self-expression through values and virtues;
- To present new motivational knowledge about a value system and moral criteria;
- To train skills for expedient communication;
- To build an informed and motivated decision for a value-driven behavior;
- To disclose the learner's capacity to achieve the purpose through values and virtues;
- To achieve proper, practicable, and learner's solution to the problem with values and virtues in the rationale;

To identify the target results in advance.

3.2 Productive feedback

The MMC claims that communication is bound up with *productive feedback* which is the second significant component for building and constantly developing motivational competence. The problem with the definition of feedback (FB)—its function and especially the content—is still an excavated but unshaped field with blurring boundaries. Some authors presented general feedback literature (Hattie and Timperley, 2007; Lipnevich et al., 2016). Walsh (2014) summarizes that students' feedback "can be a crucial way to evaluate teaching, assess a new curriculum, and improve classroom achievement" (p. 1). Developing the idea of a "feedback culture," Gehlbach et al. (2018) applied the psychological principle of cognitive dissonance to "cultivating teachers' support" by using student-perception surveys as a component of teacher evaluations. Their findings about building the culture of feedback go through a bilateral and consistent process, centered on teachers: 1. *teachers' FB*→for the principal's work, 2. *teachers' FB*→for the students' work, and finally 3. students' FB→for teachers' work. However, the norm of evenhandedness will stay relative.

Essential information about feedback in a concise review of feedback models, their descriptions, and definitions is presented by Lipnevich and Panadero (2021). They provided comprehensive information about 14 feedback working models which may be utilized, assessed, estimated, and enriched. They integrated the 14 models and selected the most prominent elements of message, implementation, student, context, and agents. However, this generalized model does not include elements of human values and moral virtues. This gives us reason to be more categorical regarding the spiritual values to be the starting point for the feedback. As we said before, feedback is always bound with cognition, where cognitive processes act (Narciss and Huth, 2004). For education, pedagogical aspects of feedback are of paramount importance (Nicol and Macfarlane-Dick, 2006; Hattie and Timperley, 2007), how to activate feedback effectiveness (Carless and

Boud, 2018), or student responses to feedback, moreover, they generate feedback, and both are crucial for the educational process (Lipnevich et al., 2016).

We agree that information delivered to students cannot be regarded as feedback (Boud and Molloy, 2013), and it is transferred by the teacher/lecturer or through various sources. However, the education process, through which one makes sense of the received information and uses it to enhance their work or learning strategies (Boud and Molloy, 2013), ensuring an individual response to the perceived information. In this sense, the interactive feedback educator-student builds loops, chains, and spirals forward through time (Carless et al., 2011; Carless, 2018).

In terms of motivational competence, we generally share the sense of Hattie and Timperley's (2007) definition of "feedback as information provided by an agent (e.g., teacher, peer, book, parent, and self-experience) regarding aspects of one's performance or understanding." However, the issue of the difference between interpretation and feedback stays open. For the functions of the MMC, we conceptualize the feedback content as a motivation stimulus of paramount importance for learners to understand and encompass the new information about the two systems of human values and moral virtues so that they can utilize them for their purpose. The result of the feedback can be ascertained in the effectiveness of the decision and the behavioral response.

3.3 Effective critical thinking and relational approach

The survey analysis of the collected feedback information in class needs educators to apply an *effective critical thinking approach*. The MMC offered here was not created to unfold the concept of critical thinking (CT) in a new light but to confirm that education is in dire need of CT. As we have already cited (Section 3), the nature of critical thinking definitions is quite complicated (Cuban, 1984); there are policy and research dilemmas in the teaching of reasoning. However, from ancient times, it is well-known that Socratic Questioning is a CT teaching strategy (Beach, 2004). His questions are systematic and urge students to be aware of their steps in reasoning—not to make wrong assumptions, ignorance, misconceptions, and finally, false conclusions. The questions stimulate thinking but do not require a definite answer.

How to understand the concept of critical thinking? It has plenty of definitions from the perspectives of various scholars. On that occasion, Davies (2015) noted simply: "Critical thinking cannot be all things to all people." Cuban (1984) more metaphorically and vividly evaluated the nature of the definitions as "being mired in a conceptual swamp" (p. 686). In support of the communication approach of our model, teachers can start with Benesch's (1999) article about the significant skill of "thinking dialogically" to achieve CT and Brookfield's (2012) suggestions on how to teach CT, and also dispositions toward CT should be considered (Facione, 2000). Contemporary researchers try to clarify the difficulties in teaching CT (Willingham, 2008) or show major factors such as elementary clarification, reasoning skills, judgment, assessment, and as a final step inference. Gelder (2005) presents some lessons from the view of cognitive science; Rasool et al. (2002) study how to apply CT in the diverse world today. For Cottrell (2005), developing effective analysis and argument is the main factor for CT skills.

Recently, a variety of models of critical thinking have been created, which is useful for teachers to have the possibility to choose any that is appropriate for a certain task and purpose. Davies (2015) suggests an easy-to-perceive and -understand model for teaching CT; Kuhn's (1999) model is for developing CT; Case (2005) suggests how to move CT to the main stage. The model by Garrison et al. (2001) points out features such as triggering events, exploration, provision, and resolution.

Critical thinking is an "uncontested" essential skill in the 21st century within educational and professional settings (Heard et al., 2020). In addition to the curriculum goals of every subject, any education level is characterized by plenty of complementary objectives depending on the subjects studied. Accordingly, it is a huge undertaking to compose a self-sufficient CT model across various contexts—scientific, educational, social, psychological, personal, emotional, cultural, and linguistic. On the other hand, successful practices in various disciplines have normative force, so critical thinking must be closely tied to sound educational policies (Wain, 2017).

Our vision for CT is to focus on values and moral issues in the foundation of CT arguments in parallel with the other goals. This offers an additional asset for personal enhancement through the educational stages. Concurrently, the value system and moral virtues assert themselves as significant for educational policies. In brief, the MMC assumes the fundamental critical thinking skills offered by Facione (2023) as practical and easily achievable in education—analysis, explanation, evaluation, self-regulation, interpretation, and inference (p. 5). He also underlines the dispositions toward critical thinking (2000). In her literature review on critical thinking, Lai (2011) counts the components of critical thinking such as "analyzing arguments, making inferences, using inductive and deductive reasoning, judging or evaluating, and making decisions or solving problems" which involve cognitive skills and dispositions and some individual characteristics (p. 2).

Teachers can excerpt the decisive information through CT for education needs (Bieg et al., 2011). Applying CT in parallel with the *relational approach,* educators can build a more precise picture of learners' MC levels and needs. The teacher should single out and pinpoint the characteristics of the level. The relational approach necessitates a better teacher to lead with questions and foster students in class.

The critical issue and limitation of MMC is the relative personal ability (student's or teacher's) of critical thinking that features a certain range of Cgt, which points to Cgn as a significant component. Knowledge is of paramount importance because skills without sufficient knowledge are semi-productive and semi-beneficial. An individual ought to make an achievement-related choice, parallel to personal, psychological, social, cultural, religious, ethnic, and ethical characteristics, as Eccles (2005) includes the "sense of competence for various tasks" (p. 108). As we have already discussed, competence is strongly associated with Cgn. While Cgn reflects sociocultural differences, Cgt reflects one's intellectual reasoning abilities. Both underline the idea of the MMC that relevant educational tasks are covered by an individual's Cgn, Cgt, and Sk, especially through CT.

Concurrently, we state that expedient communication and productive feedback in education need *effective critical thinking* to balance between them. If an educator wants to foster a student's cogitation, which is bound to critical thinking. When collaborating with MMC, we point out the need for a parallel between the communication-based approach and the critical-thinking approach.

In our view, every definition can be just an aspect of wholeness since critical thinking in Western education has "wide endorsement" with "no proper account of it" (Barnett, 1997:1). There are also models of critical thinking more likely philosophical ones. Philosophical definitions are not of assistance in our case just to become a critical student and citizen in future but not to be taught critical thinking.

Our concept of effective critical thinking, as a functional approach for motivating, is about (a) having skills in reasoning (Cgt), which is a reach system of skills pointed out by researchers above, and (b) making inferences premised on a value system and moral criteria which have been proven traditionally over the centuries of our civilization. However, the concept has individual and social aspects depending on the scope of one's worldview. The value-laden function of MMC cannot be realized without critical thinking. We do not have in mind critical thinking, approaching the ideal critical thinker, as philosophers write about, or their virtues (Hamby, 2014). We suggest teaching the skills listed by Facione (2023) and Lai (2011), through which teachers can excerpt the decisive information and build a precise picture of a student's MC scope. Moreover, they can identify one's MC level and construct a way to use it properly.

On the one hand, the critical thinking approach should aim at two important components of critical thinking: (a) students' feeling of freedom when expressing individual opinions, needs, and wishes and (b) their needs to reveal, perceive, and be aware of themselves, which helps their development. On the other hand, by employing the critical thinking approach, the lecturer can consider the difference between the learner's logic of wishes in relation to abilities, which will allow the educator to balance them with a proper motivation approach. In addition, plenty of professional, pedagogical, psychological, and management approaches can be used individually when seeking the most functional ways of creating motivation, such as validation of the broad creative functional approaches to the MMC's purpose, such as *expedient communication, productive feedback, and effective critical thinking in the human values coordinate system is* the model's success.

Finally, but substantially, is the idea of the new coordinate system of values and virtues in the canvas of the MMC and its application in education. More precisely, all methods and approaches utilized ought to be located in this coordinate system, since education is the field of knowledge, upbringing, and personality building of all learners at all educational levels. Our concern for the moral perspective of education, already mentioned above, is developed in the next section.

3.4 Morality at the core of motivation

Nowadays, we are witnessing the accelerating slippage or decline of morality. Therefore, it is crucial to intensify our joint efforts in building student's moral system from infancy. Krettenauer et al. (2013) developed the idea of the relation between moral emotions and the development of the moral self in childhood. Taking in mind that children usually start sports in middle childhood (even earlier), we find some important research studies: Kingsford et al. (2021) noticed that moral identity emerges at the age of 8–12 years; Etxebarria et al. (2015) considered pride as a moral motive which proves the link between moral pride and positive prosocial behavior in life. Their conclusion highlights the idea of exploring how moral pride "exerts its motivating effect in real life" (conclusion). Hence, the idea of pride as a moral motive can be successfully utilized to motivate and create morality among learners, especially those involved in sports and art. Kristjánsson (2021) wishes for better political research on moral education to take more place in the JME (Journal of Moral Education), which sounds indicative of the political significance of the issue.

Researchers continue studying morality from different aspects. Han's (2015) idea of how a purpose can be turned into a moral virtue and the analysis of theoretical frameworks of moral education (Han, 2014) can help teachers develop their moral competence when collaborating with the MMC. Hamby (2014) highlights the virtues that lecturers of critical thinking should recognize the "conceptual importance" and should seek to "foster them in their students" (p. 170). The author underlines the most promising avenue for success in fostering critical thinking virtues, which is "to instruct for them explicitly as an independent track" within the existing curriculum (p. 174).

A very important concept of our model is that spiritual well-being is always based on moral engagement and critical thinking. From the moral point of view, the motivational considerations when giving instructions should be the energy of the purpose that can prompt the spirit to moral values. In this sense, the MMC is tolerant of both the individual's Cgn, Sk, and Cgt and the needs and values which create morality. Exactly moral strength spiritually supports individuality. Collaborating with the model is an intervention for moral development that points to an individual's characteristic along with their education, which can change the future virtually. Following Damon's (1990) views on moral children's growth in school and their moral commitment at all ages of life, we insist that MMC can be an educational tool that collaborates with the participants in the educational process, from preschool to tertial levels, to build the moral future of education and life. Why?

An important concept in moral studies relates to *moral disengagement*. The study by Malley-Morrison et al. (2009) of moral disengagement and engagement among adults showed an anxious picture of widespread moral indifference. Turner (2008) warned that moral disengagement could predict further "bullying and aggression," which are some of the implications in civil society. However, where does it start? Definitely, in education. Sagone and Caroli (2013) reported civic moral disengagement in law (!) and psychology (!) university students which is a dangerous tendency. In their explanatory study, Cory and Hernandez (2014) were troubled by the moral disengagement in humanities majors (!) and business. George (2014) directed the interest to digital technology and moral disengagement as a predictive factor for digital aggression and cyberbullying (!). Detert et al. (2008) showed moral disengagement in ethical decision-making (!).

The list of researchers investigating the matter of morality in education is increasing in number, which is listed above as an insignificant number. The question is: How many researchers should prove the urgent need for changes in education in the direction of

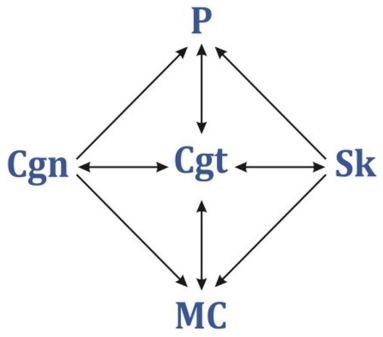

FIGURE 1
The Model of Motivational Competence. MC, motivational competence; Cgn, cognition; Cgt, cogitation; Sk, skills; P, purpose.

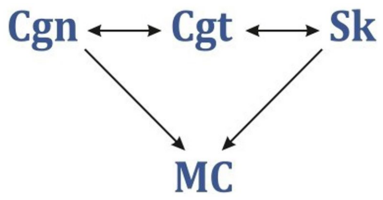

FIGURE 2
Interactions between Cgn, Cgt and Sk, and their effect on MC.

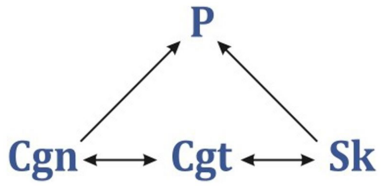

FIGURE 3
Interactions between Cgn, Cgt and Sk, and their effect on P.

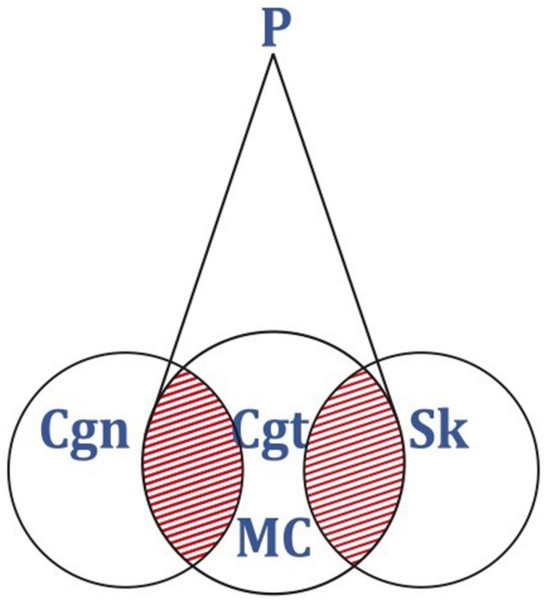

FIGURE 4
The MC field, shaded sector, and Cgt field.

human values and moral virtues in order not to lose our future? Through our model, we strongly claim that educational policies are obliged to society to take measures to drastically change education at all levels toward its humanization, sound value system, and moral virtues leading to spirituality.

4 The MMC's structural composite parts

The model takes into account both occupational and general Cgn and Sk, respectively educators' and students' (and parents' if needed). From a social-cultural point of view, the model is also a good approach to the assessment of both professional and common MC, which has practical utility for education. In this study, we propose MMC for educational goals. It can develop a motivational mindset and support teachers in motivating students more successfully. The model will be introduced both descriptively and analytically. First, let us look at it in Figure 1.

Our concept of MC is functional in three main directions: (a) movement and interaction of different individual knowledge (Cgn); (b) activation and development of individual independent reasoning (Cgt); (c) manifestation and growth of individual Sk. MC is ruled by a vast number of experiences and Cgn, Sk, and Cgt—how we can comprehend, think deeply, consider, and reflect on the components of these fields of information and how we can reason on correlations between them. The correlations between the fields in the horizontal line interrelate with both MC and P. Notwithstanding the information fields' variety, there is a reason for thinking that MC has some common features that enable us to view it as a unitary whole of Cgn and Sk, and the process of Cgt, and that ensemble we called MC. Its functional role is to be the starting point to reach the main P, i.e., it delivers the language arguments and the possibility for an act to motivate others convincingly in achieving the motivational P. In general, Figure 1 indicates the relational approach to defining better ways to motivate.

From Figures 2–5, let us describe and analyze the individual fields and their interrelations and interactions. Figure 2 shows the base of the three fields—Cgn, Sk, and Cgt—that MC is modeled from. Cgn is a bank of knowledge one has gained in life. The field of Sk contains all abilities for applying the information gained. The content on this horizontal line is organized and interpreted by the core field of Cgt. Cgt is the main scientific approach as a process of analysis, comparison, synthesis, and generalization of the collected information in both fields. The main function of Cgt is to determine and classify the correlations between Cgn and Sk in order of importance and terms for motivation.

The bidirectional vectors illustrate the impact of Cgn and Sk on Cgt and its responses. It is the teacher's verbal discourse with the other two fields, and in this network of cogitations, the extent of MC is clarified. Undoubtedly, the level of Cgt is an individual teacher's and student's characteristics, hence the result of all the reasoning, consideration, and reflection is consistent with the Cgt level.

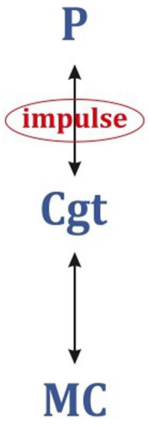

FIGURE 5
Interactions between MC, Cgt and P.

Every field of Cgn, Cgt, and Sk can have multiple directions depending on the number of participants under investigation in certain circumstances. In other words, every direction surveys only one participant's knowledge, skills, and thinking. For example, applied to the level of primary school especially (but not exclusively), the model is used in three directions: teacher, student, and parent. It can be used in the education (and not only) of all degrees, and then, the number of directions would be much greater due to the increased number of teachers at secondary schools or universities. We take 'three directions' in the sense of three vectors, each of which models particular competence viewed, respectively, as the teacher's, student's, and parent's *abilities* to "fill in" their three fields of information—Cgn, Cgt, and Sk—undoubtedly, with some degree of relative certainty.

Figure 3 denotes the importance of interconnection and interaction between Cgn, Cgt, and Sk in seeking significant and pertinent information to achieve the P. Purpose is the goal that a teacher must be aware of. Unfortunately, most educators lose the "guiding light" to the P somewhere in the layers of the school subject material in which they immerse themselves deeply. As per our model, we observe the reason for that in the low degree of MC awareness. From this point of view, the higher the MC level, the clearer the approaches for motivating students to achieve the P. Another adverse impact can be observed in the shortage of good critical thinking that Cgt needs.

As the most important individual or teamwork component in learning and leadership in education, P is the last point of all participants' efforts. P is on top of the pyramid as an expression of the essential function of the model. But in what way can it be reached? It is presented in Figures 4, 5.

In Figure 2, we observed that one's general competencies encompass the entirety of knowledge and abilities within, respectively, the domains of Cgn and Sk. Figure 4, represented as shaded sectors, visualizes how MC is formed through the focused and purposeful efforts of Cgt to select just the expedient information from the two fields in favor of motivation. We have already observed how the contents of the Cgn and Sk fields are correlated and interact due to the Cgt field. The important function of Cgt has already been discussed in Section 3. Cgt appears to be the "leading activator" and "scholar-like conductor." How does Cgt implement these functions? First of all, according to the characteristic of its nature, Cgt performs the most active thought processes—these are an individual's reasoning skills. By Cgt, an individual (educator, learner) can deeply analyze and synthesize, depending on the level of their reasoning capacity, the important information about motivation in the Cgn field. In parallel, by induction, Cgt activates the appropriate action Sk and needs to make a decision and fulfills it. In addition, during the communication-feedback processes, both educator and learner can select and generalize the expedient data to form the picture of the learner's MC field.

As every field has its level of different dimensions, the MC level can range from the most common to high professional, it depends on the content of the three fields which form it— Cgn, Cgt, and Sk. Following their capacity, the teacher or researcher can define the range of MC and classify it from low, through usual, to professional and their sublevels as well. MC is unitary of all expedient constructive elements of the three fields. MC can contain information, to the appropriate extent, about motivation theories, methods, approaches, means, cultural characteristics, belief-ethnical features, psychology, personal experience, and individual characteristics, as well as relevant skills for applying all this knowledge in practice. As we have already stated, the approach to recognizing the individual scale of MC must be applied in a holistic context.

Moreover, the recognition and elicitation of human values and moral virtues from the purpose of the task (in schools or university curriculums) are of paramount importance at this stage of the motivational process. They must be highlighted by the teacher.

Since the MC contains essential information about motivation, the P (educational or managerial) is the point where the MC accomplishes its goal-directed manifestation. In this manifestation, Cgt is of paramount importance again. Cgt adheres to the principles of interrelations and congruence between the Cgn-shaded-sector and Sk-shaded-sector and comes out its functions through three distinct phases, namely, analysis, synthesis, and generalization. This systematic approach allows for the extraction and transformation of substantial information into a highly effective motivational strategy for P. The next steps are making a decision and performing through action. The model implies the creative application of individual professional, pedagogical, psychological, and management approaches, as well as the personal charisma of a leader when one creates or supports motivation in others.

Cgt implements selecting, organizing, and correlating processes between Cgn and Sk fields. Cgt looks for the substantial and beneficial components of both fields that can be united by the relational approach to form the MC field to perform its role.

Figure 5 denotes the ultimate and crucial interaction in the vertical between the obtained MC and the covering processes of Cgt. Cgt executes its essential goal-directed function, which is the educational and leading sense of the model. The bidirectional vectors in the vertical MC↔Cgt↔P indicate the correlations between the excerpted expedient MC, the goal-directed reasoning (Cgt), and the impact of the P on Cgt to find the desired approach to P.

As the figure shows, the achieving of the P passes through an *impulse*. But what exactly is the impulse? MC is an interaction between the information of Cgn and Sk fields, which means MC is power and energy (information is equivalent to energy). These interrelationships reveal that the MC content—collected, cleared, and classified—reflects the choice of the *impulse*, pointed at P, energetically. Consequently, the higher the level of MC, i.e., the higher the level of information energy, the more impactful the impulse.

5 Discussion

Our project supposes three important ascertainments: (a) teachers have to choose from varying degrees of MC displayed by students; (b) while, imaginably, children in primary school have a low level of MC, and the work with them is much more, students at tertiary educational levels ought to be thought into higher skills; (c) therefore, teachers' MC is the fundamental one, since motivational considerations for the given instructions indicate the educator's MC level. In this sense, our model comprehends the feedback of all participants in the learning process and relates their fields of MC to each other by correlating organizer Cgt. Cgt is the core process of working through questions for feedback so that motivational competence can be described and developed.

5.1 Questions for feedback

East philosophy respects three important questions for the enlightenment of individuality: *know-what*, *can-how*, and *wish-why*. Generally, questions of What, How, and Why may aim to investigate the unknown learners' MC. However, in education, the MMC emphasizes their reference to finding better or new ways to upbringing, creation, and support motivation through values and virtues. Therefore, we divided the questions into two groups according to their goals: (a) pointed to *achieving the curriculum purposes* (implementing the curriculum) and (b) pointed to the *achievement purpose*. The latter questions are oriented toward values and virtues as purposes to be achieved in education.

What- and how-questions commonly help with achieving certain goals in the learning process. However, pointing to the *achievement purpose,* why-questions may accomplish the much more substantial function of developing a moral value system. Usually, teachers follow what- and how-questions which are good for task implementation in class. However, the feedback by why-questions provides ample opportunity for training in morality. Teachers should pay attention to how closely related the questions, feedback, and purpose are to each other and what moral virtues can be derived from them.

For work with the MMC, initially, teachers should have basic Cgn on MC. On the foundation of that knowledge, they can realize the task if the student has the Sk to achieve the P. Meantime, teachers ought to lead learners to the human values and moral virtues at the heart of the P. By giving questions, the teacher should go as deeply as possible into the components, constituting the variables to summarize the MC. For example, when the model is being applied to a learner, variables ensue from individuality and a certain educational setting. As a result, the clarified variables may be the concrete lacks, obstacles, or needs pointed out by the respondent and perceivable by the educator. The teacher excerpts those which are of crucial importance for the individual and the seeking P. After tracking the problem, the teacher, as the conductor of the teaching process, can give instructions to lead one's motivation due to the combination of those variable components that are expedient.

This process in education is conducted through making free conversation with precisely selected questions for feedback and proficiency, which was led by the teacher. The attention is on the respondent's reflexive reasoning so that the way of motivation to be clarified as a path to the P. Consequently, the most functional factor of the model is the selection of the questions.

5.2 Tentative preliminary questions on lacks, obstacles, and needs

The key questions ought to make sure that the investigation process is successful. They are aimed at describing the components of the variables—*lacks, obstacles, needs*—in the circumstances under investigation, such as teaching and learning situation, participants, social surroundings, cultural-ethnical climate, time, topics, tasks, and purposes. The questions help participants explore what they may do to fill in the identified lacks and how to overcome the obstacles (if possible) and realize the indicated needs in the light of some moral virtues. The questions can improve the perceived ideas of motivation and further develop the proper goal-achieving ideas.

For example, you can ask students and parents key questions on *lacks*, referring to the teacher or lecturer:

- What are the main lacks in class?
- What is lacking in the teacher's instructions for students' better preparation?
- How does the teacher make you feel confident in class?
- Is the teacher always available for your questions? Why not?
- Is the communication with your teacher fruitful? Why? Why not?
- How does the teacher listen to each student—absently, carelessly, carefully, smiling?
- Does the teacher recognize the patterns of individuals' behaviors?
- Does the teacher talk about human values and moral virtues in life?
- How many human values and virtues can you count?
- Does the teacher explain to you how you can get motivated?
- What support does the teacher give to students' motivation?
- How does the teacher raise the students' morale?
- Is your teacher a good pedagogue/leader/person?

Here, questions beginning with "If you were a teacher, what/how/why/which would you …?" are substantial for the feedback. They make students grow in their reasoning skills (Cgt) and express themselves more freely. This manner of seeking feedback is an appropriate two-pronged approach: teachers ascertain their students' reasoning faculties levels and critical thinking skills. In parallel, students' responses give convincing information about the teacher's level of motivational skills, i.e., whether they can create, incite, stimulate, and support learners' motivation, premised on a value system and moral virtues. Here are some examples:

"If you were a teacher, …

- What instructions would you give your students to motivate them to study?
- How would you make your students feel free to express themselves?
- How would you motivate your students to be good people?
- Why teaching students human values and virtues are important?
- Which values and virtues would you teach first? Why?

Under *obstacles*, we understand primarily technical and technological hindrances such as electricity, internet connection, computers, laptops, platforms, appropriate mobile devices, educational materials, and time sufficiency. Facing such conditions, which are mostly administered by officials, institutions, departments, and locally, for financial reasons., teachers can do almost nothing to solve the problems or improve the conditions in the short term.

The variable need is significant to the greatest extent. Questions about needs receive the largest responses because: (1) MMC emanates from the learner's personality, (2) it creates a sense of talent in students, and (3) learners will fulfill their potential to express themselves, which enriches our understanding of the importance of students' feedback about their needs. The content of needs gives perspective for the future of education.

Now, let us propose some tentative questions about the learners' needs; however, there can be a variety of questions depending on the learners' personalities:

- What are your three most important needs at school/university—ask questions, be confident, express yourself, overcome your shyness, give your opinion, show your talents, be free to show your opinion, and develop your critical thinking?
- What do you need to do more in class: (a) reading, writing, drawing, painting, role plays, playing funny games, and conversations about life (at school); (b) more practice in new knowledge, communicating, discussing, disputing, arguing, and developing critical thinking (mainly at university, to a possible level at school)?
- What of your abilities do you need to show in front of an audience?
- What kind of support do you need?
- Do you go in fear of the consequences of failure?
- Do you need to be more encouraged by your teacher? What for?

"Why"-questions ought to lead to the formation and strengthening of moral virtues, which may be elicited from the meaningful elements at the purpose core. "Why"-questions should be adapted to the learning task and the individual characteristics. Using social-cultural realities, a teacher can develop students' intellectual capacity and educate them in the moral virtues of critical thinkers. About the virtues of critical thinkers, Hamby (2014) reminds us that important "emotional virtues" such as tolerance, patience, empathy, goodness, and love are basic in life.

6 Limitations and contributions

There are a few limitations to this article: (a) The application of the model is limited to communication interactions in teaching–learning contexts that are specific to education at all levels. However, the idea of spiritual development through motivation transcends this limit and affects educational policies and policymakers; (b) The theoretical basis covered was limited to free materials available in English from different sources; (c) We announced that this article is literature-based and depends on the methodological validity of the studies and resources used. In respect to the spiritual development of human beings, there are no limitations to models, methods, and approaches.

The contributions of the model will be unfolded in several points.

- We expanded the general concept of motivational competence with a focus on a value system and moral criteria. The model proposes a new trend of motivational competence development toward human values and virtues in its foundation. The reason for this is the recent tendency toward weakening students' motivation more likely because of a lack of values and virtues on which they may convincingly justify themselves.
- We laid the two systems of values and virtues in the essence of motivational argumentation. So, they fill in the indicated lack that we found in motivation learning theories and research studies. These two systems can bring together cognition and reasoning skills and focus them on spirituality.
- Since every process in education is a reflection of educational policy, the model upholds the opposite idea as well: educational policies ought to make profound and purposeful changes in the realm of spiritual education incited by the rank-and-file employees in the hierarchy of education.
- The above motives are unified by a spirituality which affects the young generation's ability to make solidly reasoned decisions. A clear awareness of the moral value gives a sense of right and the individual can convincingly manifest the decision in their behavior. Reasoning faculties and effective critical thinking build the individual into a citizen of society.
- The model of motivational competence has a non-limited demographic focus on education—from kindergarten, preschool, school, and university, with perspective in life.

Our concern is whether methods within the curriculum disciplines are adequate for the problems of morality and human values. This persists as a concern for society and an obligation for educational policies. However, the model itself is an approach to values and moral principles in education aimed at the final act—moral and valuable behavior. MMC relies on the premise that a human being has innate inclinations and the inner ability to acquire moral virtues and live due to values that can provide spiritual prosperity.

7 Conclusion

Over the years, learners have been established as "impersonal material" in the educational system. Their adaptation to the educational doctrine has been a process of internal emigration for an individual from themselves. Here, structured model of motivational competence can help learners come back to their individualities through educational and communicative procedures for motivation based on values and virtues. They lead to natural and inherent emotional feedback and critical thinking. Moreover, we consider the recovery and in-depth study of the ethics discipline as a sociocultural and moral imperative for education in the 21st century. The emphasis on the value system and moral criteria is paramount in the present time, which is saturated with cruelty, war, and murder.

Teaching and learning human values and moral virtues for motivation can enable an individual in vital aspects: (a) to

be aware of social facts, (b) to compare and reasonably assess through critical thinking, (c) to demonstrate abilities to cogitate on human values and virtues and embody them into the argumentative part of the motivation, (d) to make well-reasoned decisions, and (e) to build motivated behavior. Competence in the value system and moral criteria and the mental process of critical thinking and making decisions develop self-identity, increase self-awareness, and enhance a person's spiritual growth. The acquisition of moral qualities such as responsibility, empathy, compassion, and goodness provides the basis for the success rate in society.

The MMC is a functional model that can make a genuinely innovative contribution to the morality and humanization of education. However, the question that worried us is: Would teachers appreciate an approach to the fulfillment of teaching and learning processes in motivational competence that involved not only just traditional teaching but also their personal growth in morality and motivational competence, i.e., cognition, cogitation, communicative skills, and reasoning abilities? Future research that can determine the trend is forthcoming.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

FS: Conceptualization, Methodology, Discussion, Writing – original draft preparation, Visualization. EG: Conceptualization, Methodology, Discussion, Writing – original draft preparation, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 07 August 2024
DOI 10.3389/fpsyg.2024.1378843

OPEN ACCESS

EDITED BY
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RECEIVED 30 January 2024
ACCEPTED 22 July 2024
PUBLISHED 07 August 2024

CITATION
Wieser M, Novak-Geiger V and Müller FH (2024) Who stays? Who goes? Motivation and tendency to drop out in music schools.
Front. Psychol. 15:1378843.
doi: 10.3389/fpsyg.2024.1378843

Who stays? Who goes? Motivation and tendency to drop out in music schools

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Based on self-determination theory, this study examined the extent to which the satisfaction of the basic psychological needs for autonomy, competence, and social relatedness in instrumental lessons explain the quality and quantity of motivation, which are responsible for persistence and dropout in music schools. This study also investigated whether parental involvement contributes to dropout. A total of 140 music students from Austria (37.16% male, 62.1% female, 0.8% diverse) were surveyed using a quantitative questionnaire. The central variables are the tendency to dropout (dependent variable) and, as predictors, the motivational regulation styles, the satisfaction of basic psychological needs in the classroom and parental involvement. The results of a structural equation model indicated that satisfaction of basic needs in class and parental involvement, mediated by motivation, predicted dropout tendencies. Autonomous motivation in lessons is negatively associated and controlled motivation is positively associated with the tendency to drop out of music schools. Satisfaction of basic psychological needs during lessons and parental involvement predicts autonomous motivation. However, basic psychological needs cannot predict controlled motivation but parental involvement can predict controlled motivation to a limited extent. Finally, this study emphasizes the practical importance of need satisfaction and parental involvement in motivation and continuing to play a musical instrument.

KEYWORDS

instrumental music instruction, self-determination theory, basic psychological needs, tendency to drop-out, parental involvement

1 Introduction

Learning to play musical instruments is a rewarding experience for both children and teenagers and requires practice and hard work to achieve proficiency. However, not all individuals find it equally enjoyable and may struggle to maintain motivation; over half of music students stop playing their instruments by the age of 17 years (Ruth and Müllensiefen, 2021). The reasons for the individual differences in motivation may lie in the quality of music instruction or support provided by the social environment (McPherson et al., 2012). Therefore, drawing on self-determination theory (SDT; Ryan, 2023), this study examined the reasons for the tendency to dropout of music schools. According to SDT, basic psychological need satisfaction (BPNS) is fundamental to the quality of motivation that can predict persistence or dropout (Evans et al., 2013; Ricard and Pelletier, 2016).

Over the last two decades, an increasing number of studies have emerged on motivational conditions, processes, and outcomes in the field of music (for a summary, see Evans, 2015). However, studies that explicitly concern the motivational aspects of learning a musical instrument (e.g., Küpers et al., 2014; Evans, 2015) are scarce, particularly when exploring persistence and dropout from music schools (Ruth and Müllensiefen, 2021). Nevertheless, previous studies have indicated that parental involvement, similar to the formal education system, is important in motivating children to play musical instruments (McPherson et al., 2012; Evans, 2015). The present study explored whether BPNS in instrumental music lessons in music schools and music-related parental involvement could explain motivational regulation and, ultimately, music school dropout tendency.

Music schools in Austria, where this study was conducted, are not integrated into the formal education system and are financed by public funds (approximately 3/4) and school fees (approximately 1/4). There are a total of about 380 music schools throughout Austria and music school teachers are employed by the federal state and have completed a university or conservatory degree in instrumental music or vocal music education. Music school lessons are an extracurricular activity that typically occurs during the afternoon. Children, adolescents, and adults learn to play musical instruments at music schools that offer major subjects (instrumental instruction and vocal instruction) and minor subjects (music theory, ensemble playing and orchestral playing). A total of 205,000 individuals took lessons in Austrian music schools during 2020/2021 (KOMU, 2024). Usually, lessons in music schools occur weekly in one-to-one and group lessons. Outside of music schools, it is possible to receive private instrumental or singing lessons. However, these are not within the scope of music schools and were not included in the present study.

2 Self-determination theory

Compared with other motivation theories, such as trait theory approaches or concepts that can be assigned to the tradition of cognitive action theories, SDT is based on the assumption of dynamic personality concepts (cf. Krapp et al., 2014). SDT (Ryan and Deci, 2017; Ryan, 2023) is a functional theory of motivation that allows analyzing motivationally relevant personal and environmental conditions, motivational processes, and outcomes in context, particularly in the field of education. It proposes different types of motivation along a continuum, as displayed in Figure 1: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. External regulation aligns with the traditional concept of extrinsic motivation and involves pursuing rewards or avoiding unfavorable outcomes. For a music student, external regulation is exhibited when students prepare well for a lesson because they are afraid that the teacher might give them negative feedback. However, this regulation lacks self-determination. Introjected regulation is another type of extrinsically motivated behavior where the individual has taken in external factors from others that the person is not entirely consensual with. For example, individuals with introjected motivation are motivated by feelings of guilt, fear of disapproval, and seeking ego improvement. In an educational context, when students learn because they are afraid of embarrassment in the classroom, experience guilt toward their parents, or want to increase their self-esteem by outperforming others, this is known as introjected regulation. In SDT, a distinction has been made between positive and negative introjected regulation, and between its approach and avoidance aspects (Pelletier et al., 2013; Gagné et al., 2015). The approach aspect relates to increasing self-esteem (e.g., being better than others), whereas the avoidance aspect relates to avoiding guilt or acting out of shame. Identified regulation is a more self-determined form of extrinsic motivation wherein the value of external behavior is accepted or perceived as important. For example, a music student identifies with the self-imposed goal of wanting to play in a band and, therefore, practices regularly. The action is still extrinsically motivated; however, it is characterized by significantly more autonomy than the other two regulatory styles of extrinsic motivation. Finally, integrated motivation is the most autonomous form of extrinsic motivation because identified regulations are completely internalized and integrated within the self after evaluation and congruency with the individual's other needs and values. At the end of the continuum of self-determination is intrinsic motivation, which can be described as the prototype of self-determination and is associated with pleasure, interest and a desire to learn.

Additionally, three basic psychological needs (BPN)—autonomy, competence, and social relatedness—are central to motivated behavior (cf. Vandenkerckhove et al., 2019; Ryan, 2023) because establishing intrinsic motivation requires the fulfillment of the following needs. First, autonomy refers to the need to regulate one's actions and experiences. A characteristic feature of autonomy is that actions are promoted by oneself and are consistent with one's interests and values. For example, when music students have a say in the selection of pieces in instrumental music lessons. Second, competence refers to the need to experience accomplishment and mastery in central life contexts. The need for competence is closely associated with the experience of self-efficacy (Bandura, 1971) and is expressed as the feeling of being able to do something or becoming better. In educational institutions, structures that promote competence-oriented feedback and transparent requirements are particularly conducive to the development of competences. Third, social relatedness refers to the need for belonging and feeling significant as well as contributing to a social group. Feeling connected with and contributing to others is essential (Baumeister and Leary, 1995). This can be manifested in music lessons through the teacher being perceived as a caring and secure reference. Individuals with BPNS are creative, productive, and compassionate. When fulfilled, students feel in control of their own lives, skilled in completing tasks ahead, and part of a concerned environment; hence, motivational behavior develops (Vansteenkiste et al., 2020).

3 Current state of research

3.1 SDT and instrumental music

A large number of studies have attested to the relevance of SDT in education. For example, numerous empirically validated effects have been identified concerning the affect, cognition, and behavior of autonomously motivated actions and BPNS (Taylor et al., 2014; Núñez and León, 2016; Ryan, 2023). Compared with other areas of education, motivation research has only recently focused on music education and has increasingly examined the conditions, processes, and outcomes of

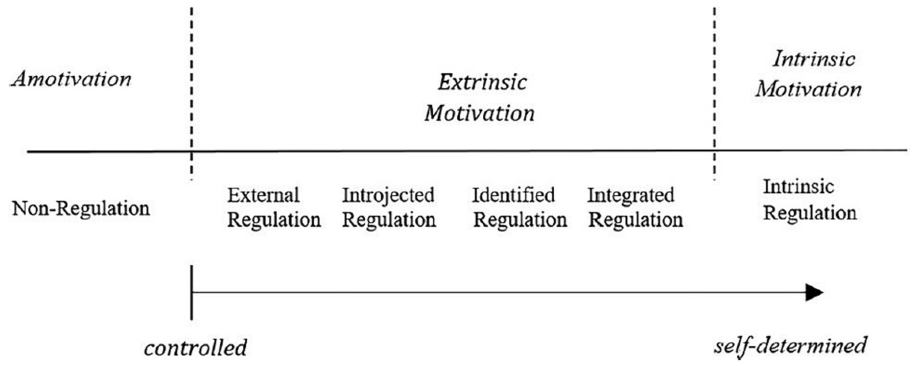

FIGURE 1
Continuum of self-determination (based on Deci and Ryan, 2002, p. 16).

self-determined motivation in music education (MacIntyre et al., 2018; Miksza et al., 2019; Kingsford-Smith and Evans, 2021). Additionally, motivational studies concerning instrumental teaching have been increasingly presented (Comeau et al., 2015; Evans, 2015; Schatt, 2018; Evans and Liu, 2019; Wieser and Müller, 2022; Kavčič Pucihar et al., 2024). According to Evans (2015), the SDT framework is suitable for examining conditions, outcomes, and motivation in music education. Perceived satisfaction with autonomy, competence, and social relatedness is crucial for motivation prediction. Renwick and McPherson (2002) demonstrated the importance of autonomy in the quality of learning and performance in music education. Furthermore, belief in one's competence plays a crucial role in continuing to learn and play a musical instrument, as most individuals engage in music-making as a voluntary activity and often stop playing if they do not perceive sufficient competence (O'Neill and Sloboda, 1997). Social relatedness is associated with self-determined forms of motivation to play instruments (Evans et al., 2013; Wieser, 2018; Wieser and Müller, 2019). Additionally, children whose basic psychological needs are not met or are inadequately met are more likely to give up playing an instrument (Evans et al., 2013; Evans, 2015; Kavčič Pucihar et al., 2024). The central importance of BPNS in motivation was recently demonstrated in a study concerning online music lessons (Kruse et al., 2013). The significance of autonomy and social integration is particularly evident in the online context. Evans and Liu (2019) demonstrated that BPNS is essential for autonomous forms of motivation when playing instruments in a high school orchestra. Evans (2015) observed that social relatedness continues to play a central role in the development of competence in later life. Another study that distinguished between different musical genres indicated that popular jazz and folk musicians experienced more intrinsic motivation and autonomy than those dedicated to classical music (de Bézenac and Swindells, 2009). Classical music culture tends to be more controlled than other types of music cultures. In summary, BPNS is not only important for the quality of motivation in music lessons and when learning an instrument but also for relevant outcomes such as resistance, identification, and sustainable learning. Therefore, SDT is particularly suitable for studies on dropout behavior.

3.2 Parents and their influence on music

Families play an essential role in children's and adolescents' motivational development in instrumental music. Music-related interactions within the family, particularly with parents, directly influence the motivation to learn to play musical instruments. Involvement has proven to be a particularly compelling explanation for this phenomenon. In the field of music, this could refer to parents practicing with their children, taking part in music lessons, and attending concerts (McPherson, 2009). Additionally, parental involvement leads to higher achievement and better motivational development (cf. Davidson et al., 1996; Zdzinski, 1996), particularly when this involvement encourages autonomy and less control (McPherson and Davidson, 2002; Kavčič Pucihar et al., 2024). Furthermore, a connection between musical involvement and self-concept has been discovered (Simpkins et al., 2010). The importance of parents' place in music is considered an important factor in the genesis of musical motivation as a whole and in playing instruments (Leung and McPherson, 2010; McPherson and Hendricks, 2010; McPherson and O'Neill, 2010; McPherson et al., 2012). Parents' expectations and beliefs concerning their children's competencies and parental feedback are closely associated with higher achievement and motivation (McPherson and Davidson, 2002; McPherson, 2009). Parents encourage and strengthen their children's self-efficacy through feedback (Schunk and Meece, 2006). Previous studies (e.g., Cheng and Southcott, 2023) have shown that students' engagement in practice is influenced by parental support. Some individuals viewed their parents in a monitoring role, whereas others found parental feedback helpful. According to Sichivitsa (2007), children tend to develop a positive self-concept based on their parents' beliefs and conceptions. Holster (2023) found a strong positive relationship between parents' influence, needs satisfaction, and task value in the music learning domains.

3.3 Dropout and music education

According to early studies on dropout from music schools in Austria (Sonderegger, 1996) and Germany (Switlick and Bullerjahn, 1999), the main reasons for dropping out were lack of motivation and loss of motivation, competing leisure activities and the associated lack of time, as well as criticism of music teachers' behavior. Recently, a growing body of research examined the relationship between basic psychological needs according to self-determination theory (SDT) and music dropout. Previous studies have examined ceasing music (activities) in adults through retrospective interviews and have highlighted numerous obstacles hindering lifelong engagement in

music (Pitts and Robinson, 2016). In a recent qualitative interview study, Kavčič Pucihar et al. (2024) demonstrated that, in addition to BPNS, the presence of competing extracurricular interests or a lack of interest in music theory and solfège can also explain dropout. Furthermore, a quantitative survey involving children, conducted during their participation in a school music program and after discontinuation, indicated that BPNS tended to be notably low just before cessation compared with earlier assessment points (Evans et al., 2013). Additionally, StGeorge's (2004) comprehensive review identified several discontinuations of musical education contributing factors. These encompass sociological and sociopsychological elements, such as the family's social and economic status, perceived support, practice time, personal beliefs concerning competence, and external motivation, all of which play a role in the decision to discontinue music education. While extant studies often centered on music as a school subject, particularly instrumental music, only a limited number of studies have explored the intersection of SDT and dropout/ceasing musical activities, as exemplified by Evans et al. (2013). Notably, empirical studies examining motivation in extracurricular (instrumental) music setting contexts are scarce. One area of interest involves the examination of the influence of parents and families on music and musical activities. However, a notable absence of empirical studies grounded in SDT remains within this domain. This study aimed to investigate extracurricular instrumental music learning in Austrian music schools, focusing on basic psychological need fulfillment and parental involvement as explanatory factors for the continuation or tendency to dropout in music schools. Based on the current state of research, the following hypotheses were derived:

1) The higher the BPNS, the more pronounced the autonomous forms of motivation. Moderate associations are expected in this study. BPNS exhibits a weak or nonexistent correlation with controlled forms of motivation.
2) The higher the students' perceptions of parental involvement, the higher their autonomous forms of motivation will be. Moderate correlations are to be expected here. Parental involvement tends to negatively correlate with controlled regulatory styles of motivation.
3) The higher the students' autonomous forms of motivation, the lower their tendency to leave music school. Moderate correlations are expected. According to this hypothesis, controlled forms of motivation can also explain the tendency to dropout.
4) Parental involvement and BPNS can explain the tendency to dropout mediated by motivational regulation. Thus, a structural equation model was used to examine the extent to which parental involvement and BPNS could explain the tendency to drop out of music schools. Direct explanatory paths from parental involvement or BPNS to the tendency to drop out are expected to be small or zero.

4 Materials and methods

4.1 Participants

The sample comprised 140 music students (37.1% male, 62.1% female, 0.8% diverse) aged 8–27 years (M_{age} = 12.86, SD = 3.89) and was conducted at three music schools in Austria. The most prominent and represented instrument groups were woodwinds (26.2%), followed by keyboard instruments (20.6%), and strings (18.4%). On average, the musical students in this study had four musical instruments at home. Of the participants, 80.9% had at least one family member who played an instrument, and 76.9% played with family members at least once per week. Furthermore, 93.0% had friends who played an instrument. Additionally, 24.8% practiced 0–15 min per day, 48.2% practiced 15–30 min, 19.9% 30–45 min, and 5.0% practiced more than 45 min per day. The sample size was estimated using G*Power software (Version 3.1.9.2; Faul et al., 2009), with $f = 0.15$ (small effect size), $\beta = 0.95$, and $\alpha = 0.05$. The recommended sample size was 138; therefore, this study's sample size of 140 participants was adequate.

4.2 Procedure

This study was approved by the institutional ethics committee (University of Klagenfurt, No. 2022–068). The participants were recruited via the music school's principal. Therefore, the research team handed out the questionnaires to the school principal with a request to forward the forms to the teachers, who handed them out to their students during a regular music lesson. The participants were informed that the questionnaires were anonymous and that their data would not be available to any teacher, school principal, or third party. Furthermore, the research team informed the participants and their parents (for participants <18) about the study's aim, the voluntary nature of participation, and their freedom to refuse to participate at any time without consequence. Parental consent was obtained from all participants <18 years of age. The music students were given questionnaires and a sealable envelope (with a peel-off strip and stamp from the university) during their music lessons. Subsequently, they had the opportunity to leave the classroom to complete the questionnaire without the presence of a third individual (e.g., the teacher). The questionnaires were then placed in an envelope sealed by the students and given to the teacher who handed them over to the school principal. The school's principal collected all envelopes and handed them to the research team.

4.3 Measures

The questionnaire contained items on motivational regulation, BPNS, parental involvement, and dropout tendency. All items were rated on a five-point Likert scale ranging from 1 (do not agree) to 5 (strongly agree).

4.3.1 Motivational regulation

A shortened version of the self-regulation questionnaire (Ryan and Connell, 1989), adapted for instrumental music instruction, was used to determine motivational regulation. It captured intrinsic regulation (e.g., "I take part in instrumental music instruction because I enjoy it"; $\alpha = 0.80$) and three forms of extrinsic motivation regulation styles: *Identified Regulation* (e.g., "I take part in instrumental music instruction because I want to perform with my friends"; $\alpha = 0.76$); *Introjected Regulation*. Given that introjected regulation is associated with positive and negative aspects, this form of extrinsic motivation was divided into two subscales, *Positive Introjected Regulation* (e.g., "I take part in instrumental music instruction because I want to prove to myself that I am a good musician"; $\alpha = 0.83$) and *Negative Introjected*

Regulation (e.g., "I take part in instrumental music instruction because otherwise, I would have a guilty conscience"; α = 0.52); and *External Regulation* (e.g., "I take part in instrumental music instruction because I have to do it"; α = 0.71; see Table 1). Integrated regulation was not considered in this study, as it is highly correlated with intrinsic or identified regulation and can hardly be identified as a consistent factor on the continuum of self-determination (cf. Vallerand et al., 1992).

Based on SDT-related studies and the characteristics of motivation regulation styles, it is common to combine regulation styles into two scales: autonomous motivation and controlled motivation. In a study by Vansteenkiste et al. (2009), intrinsic motivation and identified regulation have been summarized as autonomous motivation, and extrinsic and introjected regulation as controlled motivation. Recent studies have shown that introjected regulation can be conceptually differentiated into positive (approach) and negative (avoidance) introjected regulation according to the degree of autonomy (Pelletier et al., 2013; Gagné et al., 2015); accordingly, positive introjected regulation was added to *autonomous motivation* and negative introjected regulation to *controlled regulation*. This resulted in the following formula: autonomous motivation = intrinsic + identified + positive introjected regulation, and controlled motivation = negative introjected + extrinsic regulation. Regarding construct validity, a confirmatory factor analysis (CFA) was performed using AMOS 26. Concerning autonomous motivation, the results of the CFA indicated an acceptable model fit, with the root mean square error of approximation (RMSEA) being slightly too high ($\chi^2 = 86.461$, df = 24, $p < 0.001$, CFI = 0.88, RMSEA = 0.12) and a good model fit for controlled motivation ($\chi^2 = 2.948$, df = 3, $p < 0.40$, CFI = 0.99, RMSEA = 0.05).

4.3.2 Basic psychological needs satisfaction

To assess BPNS in instrumental music instruction, scales validated for the school sector by Thomas and Müller (2016) were used and adapted concerning content [autonomy (e.g., "My teacher lets me choose my own pieces of music"), competence (e.g., "If my teacher shows me something, I can do it much better afterwards"), and social relatedness (e.g., "I generally feel very comfortable in class"). Based on the use of short scales (Autonomy with two items) the reliability coefficients were satisfactory (α = 0.58–0.75). Given the intercorrelations among the three basic needs (see Table 1), the scales were combined with the overall BPNS scale. This practice was utilized in several other studies (e.g., Chen et al., 2015). Additionally, the CFA showed a good model fit for the single-factor solution for basic need satisfaction ($\chi^2 = 12.925$, df = 11, $p < 0.29$, CFI = 0.99, RMSEA = 0.04).

4.3.3 Parental involvement

Zdzinski's (1992) scale was used and items were adapted to assess the parental involvement in music (e.g., "My parents talk to me about music"; α = 0.66). CFA showed an acceptable model fit, with the RMSEA being only slightly too high ($\chi^2 = 12.443$, df = 7, $p < 0.09$, CFI = 0.95, RMSEA = 0.08).

4.3.4 Tendency to dropout in music school

One item was used to assess the participants' tendency to dropout ("If I could, I would like to stop attending music school immediately"), one to assess the participants' intention to change instruments ("If I could, I would like to change music instrument immediately"), and one to assess participants' intention to change their music teacher ("If I could, I would like to change my teacher immediately").

5 Results

5.1 Descriptive statistics

Table 1 presents the descriptive statistics.

TABLE 1 Descriptive statistics.

	Music students ($N = 140$)			
	M	SD	*α*	Number of items
Motivational regulation				
Intrinsic	4.46	0.69	0.80	3
Identified	3.78	0.97	0.76	3
Positive introjected	2.74	1.03	0.83	5
Negative introjected	1.84	0.90	0.52	2
External	1.67	0.65	0.71	6
Basic needs				
Autonomy	3.76	1.04	0.71	2
Competence	4.65	0.47	0.58	3
Social Relatedness	4.65	0.51	0.75	3
Parental involvement	3.00	0.72	0.66	6
Tendency to dropout	1.22	0.66		1
Intention to change instrument	1.30	0.70		1
Intention to change teacher	1.02	0.15		1

Scale: 1 (do not agree) to 5 (strongly agree).

5.1.1 Motivational regulation

The participants exhibited a very high degree of intrinsic motivation/regulation ($M = 4.46$; SD = 0.69) and a high degree of identified regulation ($M = 3.78$: SD = 0.97) to play/learn an instrument. Simultaneously, the participants exhibited low scores of negative introjected ($M = 1.84$; SD = 0.87) and external regulations ($M = 1.67$; SD = 0.65). Positive introjected regulation was rated as medium ($M = 2.74$; SD = 1.03). These results may indicate a ceiling effect.

5.1.2 Basic needs

The participants scored high on social relatedness ($M = 4.65$; SD = 0.51) and competence ($M = 4.65$; SD = 0.47.) Support of Autonomy was also perceived as high ($M = 3.76$; SD = 1.04), but not at the level of the other needs.

5.1.3 Parental involvement

Parental involvement was rated as medium ($M = 3.00$; SD = 0.72), and participants exhibited very low scores for tendency to dropout ($M = 1.22$; SD = 0.66), intention to change their instrument ($M = 1.30$; SD = 0.70), and intention to change teachers ($M = 1.02$; SD = 0.15).

5.2 Correlations

Table 2 provides an overview of the correlations between the most important variables. Tendency to dropout correlated the most with intrinsic motivation ($r = -0.50$, $p < 0.01$) and identified regulation ($r = -0.33$, $p < 0.01$). Additionally, a moderate correlation was found between tendency to dropout and parental involvement ($r = -0.31$, $p < 0.01$). Furthermore, parental involvement correlated with age ($r = -0.25$**). Therefore, older participants perceived less parental involvement. In addition, age was significantly correlated with support for autonomy ($r = 0.39$, $p < 0.01$). Therefore, older participants perceived more autonomy in their learning environments and had less of an intention to change instruments. Therefore, a correlation was found between age and intention to change the instrument ($r = -0.22$, $p < 0.01$).

5.3 Structural equation model

This study's central aim was to predict music students' dropout tendency of music school. Therefore, structural equation modeling (SEM) was conducted using AMOS 26 (Figure 2). The SEM showed an acceptable model fit, even if the CFI is somewhat low ($\chi^2 = 664.969$, df = 283, $p < 0.01$, CFI = 0.87, RMSEA = 0.09).

The best predictor for dropout tendency was parental involvement ($\beta = -0.39$, $p < 0.01$), followed by controlled motivation ($\beta = 0.19$, $p < 0.01$), autonomous motivation ($\beta = -0.17$, $p < 0.01$), and BPNS ($\beta = -0.11$, $p < 0.05$). Autonomous motivation ($R^2 = 0.45$) was predicted by parental involvement ($\beta = 0.55$, $p < 0.01$) and BPNS ($\beta = 0.28$, $p < 0.01$). Controlled motivation ($R^2 = 0.13$) was predicted by parental involvement ($\beta = -0.09$, $p < 0.05$). Furthermore, the BPNS does not provide a significant explanatory account of controlled motivation ($\beta = -0.07$, $p = 0.11$). Thus, the BPNS and parental involvement can explain the tendency to drop out, mediated by the two motivational styles of autonomous and controlled motivation. In addition to this mediation effect, parental involvement can also directly and substantially explain the dropout tendency ($\beta = -0.39$, $p < 0.01$).

6 Summary and discussion

This study aimed to explain the tendency to drop out of music school through the BPNS in lessons, parental involvement in music, and the quality and quantity of motivation when playing instruments.

TABLE 2 Spearman correlations among measured variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Intrinsic motivation	–												
2. Identified regulation	**0.46****	–											
3. Positive introjected regulation	0.13	**0.42****	–										
4. Negative introjected regulation	−0.14	−0.01	**0.36****	–									
5. External regulation	**−0.24****	0.08	**0.55****	**0.48****	–								
6. Autonomy	**0.19***	0.16	0.08	−0.04	−0.14	–							
7. Competence	**0.36****	**0.31****	0.05	0.15	−0.06	**0.34****	–						
8. Social relatedness	**0.40****	**0.19***	0.03	−0.14	−0.13	**0.28****	**0.49****	–					
9. Parental involvement	**0.21***	**0.33****	**0.20**	−0.10	0.09	−0.01	0.09	0.03	–				
10. Tendency to dropout	**−0.50****	**−0.33****	−0.01	**0.18***	0.09	0.10	−0.10	**−0.24****	**−0.31****	–			
11. Intention to change instrument	**−0.26****	0.06	0.04	**0.21***	**0.18***	−0.05	−0.07	**−0.19***	**−0.22***	**0.19***	–		
12. Intention to change teacher	−0.13	−0.02	0.01	−0.09	0.01	−0.09	−0.15	**−0.26****	−0.06	−0.07	−0.06	–	
13. Age	0.13	0.03	0.06	0.06	−0.08	**0.39****	0.06	0.13	**−0.25****	−0.05	**−0.22****	−0.01	–

*$p < 0.05$; **$p < 0.01$; significant correlations in bold.

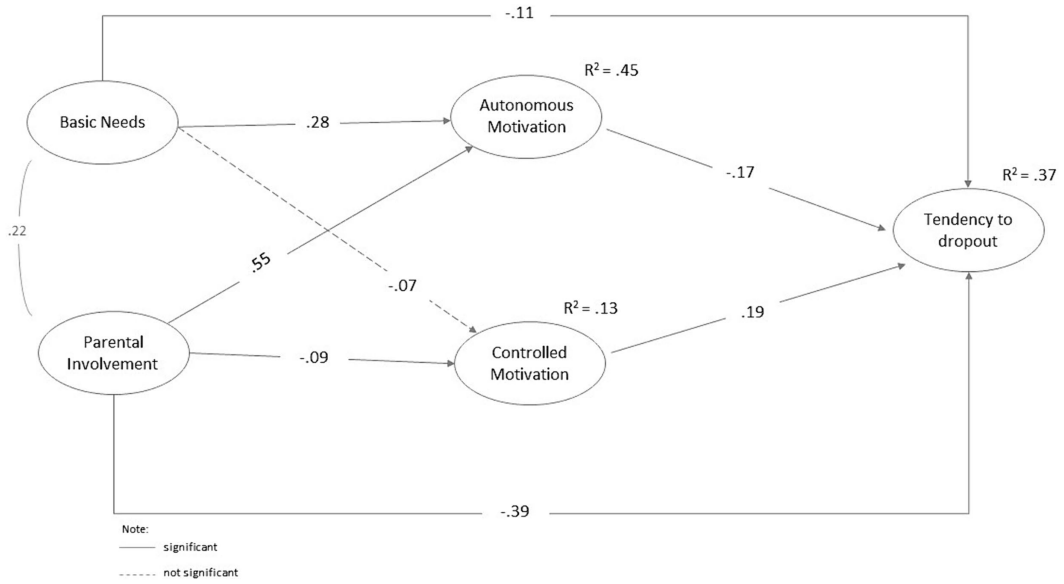

FIGURE 2
Structural equation model.

This contributes to reducing the research gap on motivation in extracurricular (instrumental) music settings. Particularly, the relevance of parental involvement has not yet been examined in previous studies (Evans et al., 2013).

This study showed that the participants were significantly more autonomously motivated to learn and play instruments and were slightly regulated in a controlled manner. The high level of autonomous motivation was a contributing factor and the voluntary nature of music school lessons in Austria also played a role. Furthermore, basic psychological needs were largely satisfied during the music lessons. Students rated parental involvement on a medium level ($M = 3.00$; SD = 0.72) and the tendency to dropout and the tendency to change musical instruments or teachers were rather low.

BPNS correlated with intrinsic and identified motivation ($r = 0.19$, $p < 0.05$ to $r = 0.40$, $p < 0.01$), confirming the *first hypothesis*. In the present study, competence and social relatedness were significantly more correlated with autonomous forms of motivation than autonomy. As expected, the BPNS provided little explanatory contribution to the controlled forms of motivation. Social relatedness was negatively associated with controlled forms of motivation. These findings are consistent with those of other studies examining the importance of the BPNS in the prediction of motivational quality (e.g., Vandenkerckhove et al., 2019; Kaiser et al., 2020; Müller et al., 2021; Ryan, 2023). However, the association between needs and autonomous forms of motivation may vary depending on the setting.

The results also confirmed the *second hypothesis*. Moderate correlations were found between parental involvement and the autonomous forms of motivation, intrinsic ($r = 0.21$, $p < 0.05$) and identified regulation ($r = 0.33$, $p < 0.01$). This is consistent with McPherson and O'Neill's (2010) findings. Accordingly, parental involvement played a central role in explaining intrinsic and identified motivation (cf. Leung and McPherson, 2010; McPherson and Hendricks, 2010; McPherson and O'Neill, 2010).

Further, the *third hypothesis* was confirmed. Autonomous forms of motivation were negatively correlated and controlled motivation was positively correlated with the tendency to drop out. Intrinsic ($r = -0.50$) and identified regulations ($r = -0.33$, $p < 0.01$) were particularly important predictors. This is consistent with the theory that negative introjected regulation (avoidance) correlates significantly and positively with the tendency to dropout ($r = 0.17$*). This means that those who act to avoid negative emotions, such as a guilty conscience or feelings of guilt, are more likely to consider dropping out of music schools.

No separate hypothesis was formulated concerning age. However, more older participants rated the BPNS in lessons more favorably than younger participants. Among other factors, this could be attributed to self-selection processes; young individuals or adult music students who are dissatisfied with their learning environment may have already departed from music schools because of lower satisfaction of their needs or because of the shift in interests. Parental involvement is no longer relevant for older students ($r = -25$; $p < 0.01$), as they seem to attend music school or play instruments largely independent of parental behavior.

The *fourth hypothesis* concerned the direct and indirect relationships among BPNS, parental involvement, autonomous and controlled motivation, and the tendency to drop out of music school. We used a structural equation model to test this. Corresponding with expectations, controlled motivation tended to lead to dropping out, whereas autonomous motivation positively affected remaining at a music school (cf. StGeorge, 2004). The BPNS explained the tendency to drop out as being mediated by autonomous motivation. The direct path of BPNS and tendency to dropout is comparatively low (ß = −0.11), whereby the negative sign was to be expected from the trend. This finding was similar to those in other studies on dropout in educational settings (e.g., Vallerand et al., 1997). Parental involvement explains the tendency to dropout via autonomous motivation but also explains dropout tendency directly. This means that music students who are supported and receive attention from their parents regarding learning

an instrument are autonomously motivated and tend to continue attending music school. This finding is consistent with those of previous studies (Leung and McPherson, 2010; McPherson and Hendricks, 2010; McPherson and O'Neill, 2010) and confirms the importance of the parental home for self-determined motivation and resistance to learning a musical instrument. In addition, McPherson and colleagues` interviews with parents (2012) showed that family dynamics (e.g., practice supervision, beliefs and values about music and family's music experiences) had an impact on children's musical development.

The structural equation model showed that the predictors BPNS and parental involvement in particular can explain the tendency to drop out of music lessons, also mediated by autonomous and controlled motivations.

6.1 Limitations and further research

This study had several limitations, including the sample size, research design, and scales used. Regarding sample composition, this study utilized a more or less self-selected sample, and only three music schools in a region were included. Owing to the estimated sample size using G*Power software and the present sample size, these limitations should not have a substantial effect. Furthermore, the possibility of sampling bias cannot be excluded, with a greater proportion of students who were intrinsically motivated participating in the survey. However, precise information on the response rate is not available. Overall, conclusions should be drawn carefully as the current study did not employ a longitudinal research design. Future studies should provide additional insights into the development of students' tendencies to drop out and their motivation to remain in music schools. A longitudinal study would allow for determining actual dropouts and not just the estimated tendency for such a behavior. Therefore, further studies are required to determine why music students quit (e.g., through interviews and a qualitative approach). Regarding the assessment of parental involvement, only music students' perceptions of parental involvement were examined in this study, without questioning the parents. Parents were not questioned concerning their involvement and the general "music culture" in the families, which has been addressed by McPherson et al. (2012) and might be included in future studies. Additionally, it would be advantageous to include teachers' perceptions in future studies.

The quality of the measurements can also be cited as a limitation in some cases. Negative introjected regulation was measured by using only two items and the tendency to dropout was assessed with one item. Consequently, the reliability of these measures is low, which somewhat reduces the significance of the findings.

This study highlighted future research interests. First, an examination of the satisfaction of basic needs revealed that autonomy was perceived to be lower than competence and social relatedness. One potential explanation for this could be the examination of the correlation between the students' preferred musical genre and the genre that dominated during music instruction. Classical genres and folk music commonly predominate in Austrian music schools. Therefore, an insufficient fit could harm autonomy and consequently lead to dropping out (see also Feshchanka, 2021). Second, music schools in this region may not be comparable to instrumental music education offered through private instrument tuition. Private music instruction partially employs more popular musical genres for their students, and some may even call themselves a "School of Rock." These schools do not specialize in classical or folk music. The fit between the preferred genre and genre played in music schools may be better for private music instruction. Third, the question arises as to the extent to which formal settings influence motivation and dropout. Music theory is mandatory in Austrian music schools (particularly when taking instrumental exams). Based on these considerations, undesired (performance) pressure could arise, which might negatively affect the motivation to play an instrument and attend music school.

Data availability statement

The data can be obtained from the authors on request.

Ethics statement

The studies involving humans were approved by Institutional Review Board of the University of Klagenfurt. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

MW: Writing – original draft, Writing – review & editing. VN-G: Writing – original draft, Writing – review & editing. FM: Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This study was partially funded by the School of Education and the Institute of Instructional and School Development at the University of Klagenfurt, Austria.

Acknowledgments

We would like to thank the music students who completed the questionnaires and the music teachers and directors of the music schools for their support.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 13 August 2024
DOI 10.3389/fpsyg.2024.1393339

OPEN ACCESS

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RECEIVED 28 February 2024
ACCEPTED 18 July 2024
PUBLISHED 13 August 2024

CITATION
Immerz A, Nusseck M, Hohagen J and Spahn C (2024) Student motivation to study music and sport – a comparison between study subjects and study programs on intrinsic and extrinsic motivational aspects. *Front. Psychol.* 15:1393339. doi: 10.3389/fpsyg.2024.1393339

Student motivation to study music and sport – a comparison between study subjects and study programs on intrinsic and extrinsic motivational aspects

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Instruction: In both subjects, music and sport, the engagement with the subject content – learning an instrument or training in a sports club – usually begins in early childhood. This makes these subjects special and similar. It is therefore of interest to examine the motivation for choosing music and sport as subjects for university study.

Methods: In the present investigation, 151 students at the beginning of their university studies were examined. Among these were 110 music university students in the Bachelor of Music (B.Mus.) and music teacher education program, and 41 sport university students in the Bachelor of Science (B.Sc.) and sport teacher education program. The study contained a custom-made questionnaire on sociodemographic data, questions on study choice alternatives and biographical musical or sporting background, as well as two standardized questionnaires on motivation for enrollment (STUWA) and on aspects that are important for the profession.

Results: Music and sport students were at a rather high and similar level of intrinsic motivation to study their subjects. However, materialistic goals motivated the teacher education students more than the bachelor's students with an artistic program. The difference between the study programs was also found in the context of extrinsic-social motivation, where the teacher training students answered with higher scores. With regard to socially-induced motivation, it was shown that music students and sport teacher education students were more socially induced to study the respective subject compared to the general student population. With regard to uncertainty when choosing a course, it was found that Bachelor of Music students were more certain that they wanted to study exactly their particular subject. The ages at which music and sport were started in childhood were similar, but the first-year music students were younger than the sport students were. Compared to sports students, music students decided their area of study earlier, and bachelor's students in music in particular had fewer alternative study options than sports students.

Discussion: The results provide a differentiated picture of student motivation to study and thus allow a deeper insight into the subject cultures of music and sport. They also open up opportunities for follow-up studies in comparison with other study subjects and programs.

KEYWORDS

intrinsic motivation, extrinsic motivation, motivation for enrollment, university students, music, sport

1 Introduction

1.1 Clarification of the terms motivation and study motivation

The term motivation originates mainly from the psychology of learning and motivation and is often used in the context of learning motivation (Myers and DeWall, 2023). Motivational and learning psychology asks what drives a person, where this drive comes from, what a person wants to achieve with their behavior and what it is aimed at (Bak, 2019). Reasons for motivation can be differentiated between intrinsic and extrinsic motivation. *Intrinsic motivation* is the desire to perform a behavior for its own sake. *Extrinsic motivation*, on the other hand, describes the desire to perform a certain behavior because of expected rewards or the threat of punishment (Myers and DeWall, 2023). While intrinsic motivation thus arises from a person's inner desires and needs, external motivation is initiated by environmental factors and relevant reference persons and groups. The differentiation between intrinsic and extrinsic motivational factors plays a central role in the discussion about university students' motivation for study in higher education.

According to Großmann (2016), many research studies analyzing study motivation use this term without precisely defining the underlying construct and its components. Motivation is understood and used in different ways in relation to the choice of a university subject. In German-speaking discourse, the terms *study motivation* [Studienmotivation], *study choice motivation* [Studienwahlmotivation] or *career choice motivation* [Berufswahlmotivation] are used quite synonymously. In the English-language literature, on the other hand, the focus tends to be on careers with terms such as *career decision* and *career choice*.

In his reflections on study motivation, Großmann (2012) assumed that students pursue certain goals and interests with their studies. He defines study motivation as a "set of specific attitudes and expectations that are linked to completing a university degree" (Großmann, 2012, p. 447).

In this publication, we use the term *study motivation* as a general concept to describe the motivation of university students (see also Grüneberg and Süß, 2023). Following Großmann (2016), we understand study motivation as a hypothetical construct that explains the type of action and behavior in the context of studying. In this sense, it means the individual attitude toward studying as well as the decision to study in general, the motivation for enrollment and the decision for a particular subject or study program at a particular university (Großmann, 2016).

1.2 Study motivation in higher education research

Study motivation is currently being discussed in several fields of higher education research. On the one hand, study motivation plays a prominent role with regard to changing subjects or student drop-out from higher education institutions (Heublein, 2014; Heublein and Schmelzer, 2018; Messerer et al., 2023). In addition, the relation between motivation and academic success (Heinze, 2018; Hillebrecht, 2019; Baalmann and Speck, 2020; Leichner et al., 2022; Stellmacher and Paetsch, 2023) or the link between study motivation and study satisfaction (Künsting and Lipowsky, 2011; Kaub et al., 2012) or teacher health (Schüle et al., 2014; Janke, 2020; Merkle et al., 2023) has been investigated in numerous studies. Also, study motivation subsumes individual orientations and motivations for starting a university degree (Bornhorst et al., 2020) or choosing a particular subject (Piroth, 2013). On this basis, Großmann (2016) emphasizes that study motivation is an important model for researching subject cultures [*Fachkulturen*] – such as music or sport.

Subject-specific differences are evident in a survey among university students in Germany on their values, goals and perspectives (Hinz, 2022). The students were asked about their motives for choosing their study subject, revealing a gender-specific difference: compared to women, men attached more importance to good earning potential (men 41% vs. women 32%) and career opportunities (men 40% vs. women 31%) when choosing a degree course. Women, on the other hand, attached much more importance to personal interest (women 59% vs. men 50%) as a motive for choosing a subject than male students. There were also differences between the study subjects. When choosing a course of study, personal interest was particularly frequent as a major reason among university students of the humanities (78%), cultural (75%), social (67%), natural (59%) and linguistic/literary sciences (54%) as well as among university students of medicine (61%). Only for law (51%), engineering/computer science (48%) and economics students (44%) earning opportunities were the more important motives. Among the humanities students, for example, only 24% stated that good earning opportunities were a very important reason for their choice of degree course. No conclusions were drawn from the results of the study about music and sports university students.

In a qualitative study on career orientation patterns and the study motivation of bachelor university students from different study programs and subjects, Bornhorst et al. (2020) found a high level of intrinsic study motivation with a high level of commitment to the subjects over all university students. It became clear that biographically based career goals – based on experience, internships, etc. – were already formed before the start of the degree course and were specifically implemented by the students during their studies. The authors (Bornhorst et al., 2020) also emphasize that the issues surrounding the topic of study motivation are highly complex and that the educational biography, the identity formation process of the students and their social background should also be taken into account. Janke et al. (2023) pursued a quantitative approach to recording study motivation and therefore developed a reliable and valid instrument to measure different facets of study motivation and motivation for enrollment (STUWA: Ein multifaktorielles Inventar zur Erfassung von Studienwahlmotivation, Janke et al., 2023). Conventional inventories often focus on specific study programs (e.g., FEMOLA: Fragebogen zur Erfassung der Motivation für die Wahl des Lehramtsstudiums; [Questionnaire to assess motivation for choosing a teaching degree program] Pohlmann and Möller, 2010). The STUWA questionnaire, on the other hand, is a generalized multifactorial scale for recording study motivation that can be used in all subjects and in various study programs. This enables group comparisons to be made between students of different subjects with regard to their study motivation. Thus, Janke et al. (2023) found interesting results in group comparisons between business students and student teachers: Teacher education students reported an extrinsic-social and socially induced study motivation, while business students in comparison to other students reported higher extrinsic-materialistic motivation for enrollment. Student teachers decided to study teacher education and to become a teacher because they were encouraged by friends, family, or colleagues (socially induced

motivation). The compatibility of family and career was also important to them when making their decision. They want to have time for family, friends, and hobbies in addition to their career (extrinsic-social motivation). Business students, on the other hand, showed that extrinsic-materialistic aspects such as a good income later on and financial security seemed to be more important to them.

1.3 Study motivation of teacher education students

As mentioned above, teaching is a well-researched profession and there are a large number of studies on the motivation of prospective teachers and their decision to study to become a teacher (Pohlmann and Möller, 2010; Rothland, 2014; Besa, 2018; Grüneberg and Süß, 2023; Janke et al., 2023). As an example, the publication by Grüneberg and Süß (2023) is examined in more detail. The authors found that an intrinsic study motivation was the main reason of first-semester university students to choose a teacher education program. The university students want especially to support children and young people in their personal development and education. Thus, most student teachers are united by a high level of professional interest. The authors also compared the results of intrinsic motivation in relation to the type of school, showing that a strong subject orientation prevails among prospective secondary school teachers. On the other hand, prospective primary school teachers are more interested in the pedagogical-educational challenge of working with students at school. These results can also be seen in the study by Retelsdorf and Möller (2012), where they analyze the association between the education study program – primary and secondary school – and the motivation for choosing teacher education. They observed that subject interest was strongly related to choosing a teacher program for secondary school, whereas educational interest was rather related to prospective teachers in elementary school. As a further result, Grüneberg and Süß (2023) found that student teachers tended to agree with the statements that the teaching profession offers good employment opportunities, flexibility, free time, and compatibility with family life. Against this background, the majority of students in the study stated that they were quite sure about their decision to study teacher education. This is also reflected in the answer to the question about alternatives: teacher education is the preferred choice of study for 87.8% of the students asked.

In addition to the quantitative part of their study, Grüneberg and Süß (2023) also conducted interviews with student teachers about their study motivation. When asked about the main reasons for their choice of study and their motivation to study, the participants primarily responded with professional status and ideal career "teacher" as well as subject interest, study content, and exchange of content. They also cite practical teaching experience during their studies as a further reason for motivation.

Only a few studies in teacher education deal with study motivation in individual subject cultures, such as Piroth (2013) with the study motivation and career expectations of students in Protestant religious and community education, or Fischer et al. (2019), who compare sport and mathematics students. As part of our study, we were interested in how motivation to study behaves in specific subject cultures such as music and sport. Previous studies on the fields of sport and music are therefore described below.

2 Subject-specific perspectives on music and sport

2.1 Studying sport

Sport students bring with them a wide range of biographical experiences in sports – from school to extracurricular activities. Sports socialization, which is often linked to sport clubs, usually begins very early, sometimes as early as preschool age (Lüsebrink et al., 2014; Wyllemann et al., 2020). Klinge (2002) thus speaks of an athlete or a sport habitus acquired prior to studying. In his model of the professional biographical development of sport teachers, Miethling (2018) attributes the development of sporting lifestyles to childhood and adolescence. In this phase, habitual patterns are acquired through milieu-specific sporting and educational experiences.

Wylleman (2019) illustrated the career of athletes in his holistic athletic career (HAC) model, defining six stages of development, each stage consisting of different successive phases. Thus, the model reflects the development of athletes' careers on a sporting, psychological, psychosocial, academic/professional, financial, and legal level of development. The discourse on the decision to study sport takes place at the point from phase two to phase three – the athletic level between development to mastery stage. Wylleman (2019) gives an approximate age of between 18 and 20 years for this psychosocial transition between adolescence and young adulthood in his model. On an academic and vocational level, the transition is accompanied by a change from school to university and thus from secondary to higher education. Peers, coaches, parents, teammates, and sports students are important in this process on a psychosocial level.

While Wylleman (2019) approaches the biography of athletes on a conceptual level, Volkmann (2008) chooses an empirical approach in her work on the biographical knowledge of teachers. She examines the influence of biographical experiences in the subject of sport. With her qualitative analysis, she was able to show that biographical knowledge has a major influence on the professionalization process of sport teachers and its progression. She reconstructed from her data that personal sporting activities and enthusiasm for sport are of great importance for the career choice. The practical sports components of the degree course are just as important for teachers working in the profession (Volkmann, 2008).

In their study, Streblow and Brandhorst (2018) looked at prospective teachers in sport and were able to differentiate between three types of students based on their motives for choosing teacher education. When comparing the three types, Streblow and Brandhorst (2018) found no difference in study motivation between sport students and non-sport students. However, they found a significant correlation between the study motivation and the chosen teaching education program. There is a comparatively high proportion of extrinsically motivated students among elementary school student teachers, while a high proportion of intrinsically motivated students predominate among secondary school student teachers. This result complements the studies by Retelsdorf and Möller (2012) and Grüneberg and Süß (2023) on a subject-specific level.

Other studies also deal with the subject-specific motivation of university students. Fischer and Bisterfeld (2015) compared the motivation of sport students for choosing a degree in teacher education (subject-specific) with the motivation of student teachers in general (non-subject-specific). The analysis of the findings reveals that the intrinsic motivation factors with educational interest, ability

beliefs, and subject-specific interest are more prevalent than the extrinsic ones. Overall, the subject-specific comparison shows only minor differences: personal career-related ability beliefs and subject-specific interest are less relevant for sport students than for student teachers of other subjects (Fischer and Bisterfeld, 2015).

Fischer and Golenia (2021) also investigated the question of why physical education students decide to choose teacher education as a study program. The four profiles identified each relate to a characteristic bundle of motivations and show that sport students are a heterogeneous group in terms of their decision-making motivation. This study (Fischer and Golenia, 2021) complements previous findings that have identified the intrinsic pedagogical motivation of sport students and student teachers in general as the main decision-making motivation.

2.2 Studying music

An analogy between sport and music exists due to the extensive biographical experiences in both areas, which has already been established in many contexts, e.g., in the context of biographical work (Immerz and Tralle, 2022). It can therefore be assumed that childhood and adolescent experiences form a kind of "background foil" [Hintergrundfolie] (Volkmann, 2008, p. 14) for music students as well as sport students even before they begin their studies.

In her biographical study of the lifespan development of professional musicians, Manturzewska (2006) describes six phases with typical developmental tasks, the first three of which are particularly relevant in the context of "music studies." The development of sensory, emotional, and aesthetic sensitivity to music begins from birth to age 5 (phase 1). The intensive development of musical skills on the instrument (phase 2: 6–14 years) is followed by the development of the artist's personality and self-confidence as an artist (phase 3: 15–25 years). This phase usually includes the decision to study and the choice of subject and study program. Against this background, Nagel (1988) has pointed out that early specialization in one instrument is desirable for technical and artistic proficiency and necessary for becoming "a serious musician" (Nagel, 1988, p. 74). However, this early specialization and focus on a career in music could also limit and narrow opportunities to explore non-musical alternatives. In most education systems, the first important phase of musical development ends with the school-leaving certificate at the transition from adolescence to early adulthood and finally leads to the vocational orientation phase (Spahn, 2015).

This transition between school and university or university of music has been examined in some studies from the students' perspective. Váradi et al. (2024) interviewed students in the final year of a vocational secondary school with music specialization about their career choice and professional motivation. They found that the main subject teacher – the instrument teacher – plays a decisive role and often influences the personal path of the students and the professional career. The immediate family environment, social ties, belonging to the community, and the idealization of the profession also proved to be possible motivations for a career in music. Guan et al. (2022) also investigated the mechanism between the school music context and the music career choice of young people in secondary school. They found that school music context significantly predicted the choice of a career in music. Furthermore, music motivational beliefs (i.e., music value and music interest) served as a mediator during this path and partially explained the psychological process between school music context and music career choice. Rickels et al. (2019) carried out a comparative analysis of influences on choosing a music teaching occupation. Their purpose was to compare motivations and influences of high school music students who express an interest in a career in music and those who do not. They compared three occupation groups using a discriminant analysis of the resulting components and found differences between the groups pursuing music teaching, other music, and other non-music. Four components were identified that could be considered as potential archetypes in future research considering selectors: full immersion musician/leader, full immersion teachers, certain aspirational leader, family, and non-leader. The authors conclude that career choices (to pursue music teaching or other choices) are more multidimensional than accounted for in previous studies (Rickels et al., 2019).

Other studies examined the perspective of music university students. Wang and Wong (2022) investigated a comprehensive cognitive motivation model and were able to prove that intrinsic motivation is an effective determinant of career intentions and decisions. The results show that cognitive factors, motivation, and environmental factors have different degrees of influence on students' professional intentions and together influence students' career intentions. Miksza et al. (2021) tested a theoretical model of a network of relationships among perceptions of competitiveness, perfectionism, teacher control, quality of motivation, and intentions to pursue a career in music. They found that the quality of motivation appears to be a good explanation for career endorsement, with intrinsic motivation strongly associated with higher intentions to pursue a music career. Path analyses showed that those with stronger career intentions also have stronger intrinsic motivation orientations. In their study, Von Georgi and Lothwesen (2010) investigated the question of whether music students at educational institutions with an artistic focus have increased competence and motivation to perform compared to students at other universities. Results show that the two scales of motivation and empathy can be interpreted as basic motivational factors for behavior and study. The dimension of motivation to study is formed by a fundamental attitude toward the general importance of music in personal experience, whereby music as a study interest moves strongly into the center of the motivational explanatory approach. Parkes and Jones (2012) investigated motivational constructs influencing undergraduate students' choices to become classroom music teachers or music performers. Using stepwise multiple regression, the authors documented that attainment value, intrinsic interest value, and expectancy predicted 74% of the variance in whether students intended to choose a career teaching music. They found that expectancy, attainment value, ability perceptions, and intrinsic interest value explained 65% of the variance in whether students intended to choose a career in music performance.

While Parkes and Jones (2012) compare student music teachers with music performers, other studies refer only to the teaching profession with music as a subject. Neuhaus (2007) deals with the career choice process of student education teachers in music and found that music studies were chosen primarily out of an interest in the subject of music and the desire to become a teacher at public school. However, it did not play a role as an opportunity or alternative course of study; rather, the students consciously chose

the study program. Weiß and Kiel (2010) also found that prospective music teachers to some extent rely on individual interests, expectations and associated professional demands when they decide to start a study as a teacher of music. Thereby, the subject-motivation of prospective teachers of music as a whole does not differ from that of other student teachers, but Weiß and Kiel (2010) found a reduced importance of the integration of work and family for the students of music. According to Thornton and Bergee's (2008) study another finding can be noted: 56% of the participants stated that significant others, especially music teachers, who were involved in their lives had an influence on their decision to study music.

2.3 Specifics of music and sport studies

Music and sport are among the degree courses for which an entrance examination is required. As this can influence the motivation to study in the context of the present study, differences between music and sport will be briefly outlined here.

In the field of music, applicants for a bachelor degree (Bachelor of Music – B.Mus.) prepare mainly for an artistic examination in *one* main instrument, for example, violin, trumpet, or voice. In addition to this artistic focus, they are examined in the compulsory subject of piano as well as in the areas of music theory and ear training. The entrance examination for teaching education with music as a main subject is broader in scope. Beside their main instrument, applicants are tested in piano and singing as well as in music theory and ear training. They are also asked about their motivation and their pedagogical skills for studying to become a secondary school teacher.

In the field of sport, there is usually a joint examination for those interested in either the Sports Science degree program (Bachelor of Science – B.Sc.) or the teacher education program with sport as a teaching subject. Applicants are tested in five different sporting disciplines: athletics, swimming, apparatus gymnastics, games, and gymnastics. In each discipline, two to four sub-areas are tested. For example, basketball, handball, soccer, and volleyball are required in the discipline *games*. The whole examination lasts a full day.

In a comparison of the two areas of music and sport, it can be stated that the entrance examination in music is more specialized and focuses on musical-artistic performance in one or two main instruments, while in sport, many sub-disciplines must be equally mastered.

Figure 1 outlines the decision-making process and possible pathway for students to study music or sport, based on the literature described above. This graphic illustrates the complex issues surrounding the topic of students' study motivation, also taking into account the educational biography, the identity formation process of the students and their social background. The following research questions focus on the area marked in red.

In summary of the previous literature it becomes clear that music and sport are supposedly special subjects that have received relatively little attention in previous research on study motivation from the university students' perspective. Although there are comparisons between music and sport in other studies, the samples are quite different, for example in a recent study by Hatfield (2024) on determinants of motivation in world-class musicians and Olympic athletes, which relates to the continuation or termination of a successful career. Nevertheless, striking and contrasting motivational

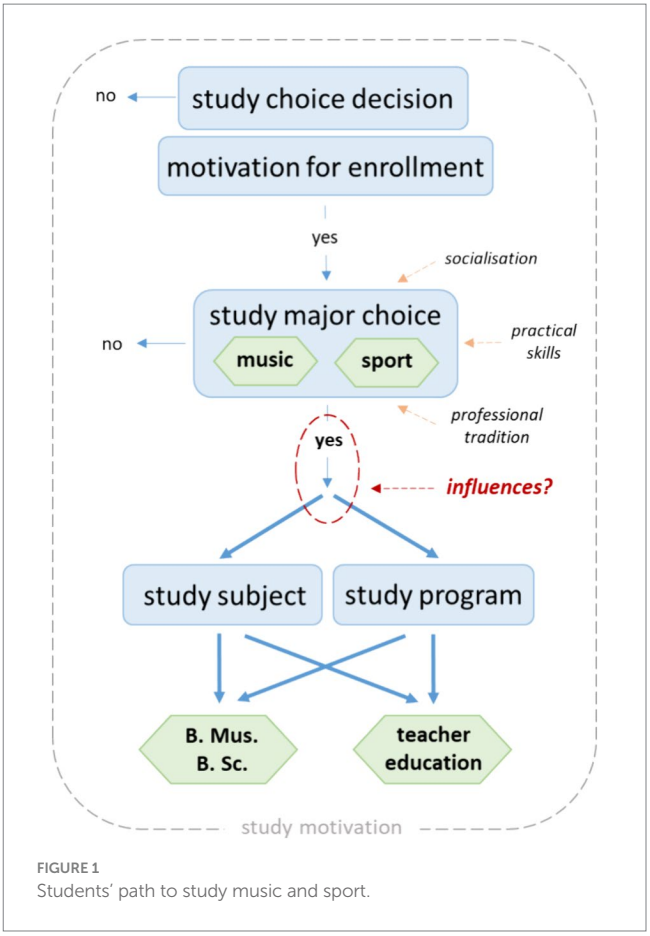

FIGURE 1
Students' path to study music and sport.

patterns were identified throughout the development of the six artists interviewed, which are also applicable to the question for study motivation in our investigation. It was found that the artists who continued their careers were largely driven by autonomous forms of motivation such as self-initiative, passion, curiosity, and a desire for endless discovery and aspiration. In contrast, controlled coercive forms of motivation drove the artists who gave up their careers.

Other studies refer only superficially to the subjects of music and sport or point to a loose connection between the subjects. Kaub et al. (2016), for example, included the subject combination of art and music in their study, but subsumed it under the group of humanities scholars and linguists. In contrast, Glutsch et al. (2018) found that the subjects of sport, music, and art could not be assigned to any subject group that can be studied at German universities. The special feature and parallelism of the subjects is that they are probably associated with a "special talent" (Glutsch et al., 2018, p. 466). Against this background, Kaub (2015) poses the question of whether the subjects of music and sport are associated with more enthusiasm, interest or professional motivation than other subjects. This question leads to the research gap that this study aims to address.

2.4 Present study: aims and research questions

The aim of the present study is to investigate university students' motivation for their decision to pursue their course of study, their motivation of enrollment, and their study major choice in music

and sport. It also aims to identify similarities and differences between the subjects of music and sport. There are three main research questions:

1. What are students' study motivations for pursuing music and sport studies?
2. Are there similarities and differences of study motivation between music and sport, and if so, what are they?
3. Are there differences in the students' motivation to study music and sport compared to other subjects?

3 Methods

3.1 Study design

The study sample consisted of university students studying music at the University of Music Freiburg or sport at the University of Freiburg. Students at the beginning of their studies were asked about their motives and reasons for choosing their study subject or degree program.

The study was performed as an online survey[1]. At the University of Music Freiburg, the survey was distributed and carried out in on-campus lectures. At the end of the lectures, an experimenter explained the study procedure and information on data protection and provided the link to the study on screen. The sports university students were given the link by e-mail via the Head of the Chair of Sports Psychology at the Institute of Sport and Sports Science at the University of Freiburg. The mail also contained information about the study and data protection.

On the first online page, the students had to give their consent to participate in the survey. The ethics committee of the Freiburg University of Music gave ethical approval for the conduct of this study.

3.2 Participants

In this study, a total of 151 university students participated. The sample included 110 music university students and 41 sport university students (Table 1). There were 51% female, 48% male and 1% diverse students without statistical distribution difference between music and sport university students. 70% of the students were in the first year of study and 30% in the second year and higher with no difference in distribution between the study subjects. The mean age of the participants studying music in the first year of study was 19.9 years (SD = 2.0 years, $N = 79$). The mean age of first-year university students in sport was 20.9 years (SD = 2.2 years, $N = 26$) with significant distribution difference between music and sport ($p = 0.024$). For the study program, 57% were in the Bachelor of Music (B.Mus.) and Bachelor of Science (B.Sc.) study programs and 43% studied for secondary school teacher education in music and sport. The mean age when the university students started with instrumental practice or sport training was 6.5 years (SD = 2.7 years) without significant difference between the study subjects.

3.3 Questionnaires

The study contained a custom-made questionnaire on sociodemographic data and two standardized questionnaires.

The questionnaire on socio-demographic data consisted of questions on age and gender, and questions about the study, i.e., the study program, the main instrument or sports area, and the semester of study. In addition, questions about biographical musical or sports background were included. For that, the students were asked at what age they started actively making music or practicing sport (see Table 1). They were also asked about their age when the decision for studying music or sport was made.

Furthermore, a question was added that relates to an alternative to the choice of this study. The item "Had you considered an alternative to studying music/sports?" was answered on a four-point scale with 1 ("no") to 4 ("yes").

3.3.1 Questionnaire on motivation for enrollment (STUWA)

The STUWA questionnaire used is a multi-factorial inventory to measure motivation for enrollment (STUWA: Ein multifaktorielles Inventar zur Erfassung von Studienwahlmotivation; Janke et al., 2023). Five of the scales were selected for the survey: (1) intrinsic, (2) extrinsic-materialistic, (3) extrinsic-social, (4) socially induced study motivation and (5) uncertainty of the study choice (see Table 2). Each

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TABLE 1 Sample characteristics.

	Music university students	Sport university students
Amount	$N = 110$ (73%)	$N = 41$ (27%)
Gender	49% female, 50% male, 1% diverse	57% female, 43% male
Semester	95% first year of study 28% second year or higher (with 74% 3. semester)	81% first year of study 37% second year or higher (with 47% 3. + 4. semester)
Mean age (SD) of first-year-students	19.9 years (2.0 years) $N = 79$	20.9 years (2.2 years) $N = 26$
Study program	62% Bachelor of Music (B.Mus.) 38% Teacher Education *Music*	44% Bachelor of Science (B.Sc.) 56% Teacher Education *Sport*
Mean age (SD) of start music/sport	6.6 years (2.7 years)	6.0 years (2.6 years)

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TABLE 2 Mean values of the STUWA scales by study subject and program.

STUWA scales	Study subject	Study program	Mean	SD	*N*	Statistics
Intrinsic ($M = 5.98$)	Music	B.Mus.	6.29	0.78	65	$p = 0.001$
		Teacher Education	6.19	0.64	42	$p = 0.021$
	Sport	B.Sc.	6.19	0.51	17	$p = 0.051$
		Teacher Education	5.97	0.68	23	n.s.
		Total	6.20	0.70	147	n.s.
Extrinsic-materialistic ($M = 4.98$)	Music	B.Mus.	3.35	1.58	65	$p < 0.001$
		Teacher Education	4.61	1.39	42	$p = 0.047$
	Sport	B.Sc.	3.47	1.11	17	$p < 0.001$
		Teacher Education	5.11	1.21	23	n.s.
		Total	4.00	1.59	147	$F(3,143) = 12.4$, $p < 0.001$
Extrinsic-social ($M = 4.48$)	Music	B.Mus.	4.22	1.48	65	n.s.
		Teacher Education	5.07	1.48	42	$p = 0.007$
	Sport	B.Sc.	4.60	1.19	17	n.s.
		Teacher Education	5.85	1.20	23	$p < 0.001$
		Total	4.76	1.52	147	$F(3,143) = 8.5$, $p < 0.001$
Socially induced ($M = 3.01$)	Music	B.Mus.	3.49	1.63	65	$p = 0.010$
		Teacher Education	3.87	1.52	42	$p < 0.001$
	Sport	B.Sc.	3.00	1.25	17	n.s.
		Teacher Education	3.98	1.30	23	$p < 0.001$
		Total	3.62	1.53	147	n.s.
Uncertain ($M = 3.23$)	Music	B.Mus.	2.40	1.45	65	$p < 0.001$
		Teacher Education	3.28	1.48	42	n.s.
	Sport	B.Sc.	3.70	1.42	17	n.s.
		Teacher Education	2.81	1.34	23	n.s.
		Total	2.86	1.50	147	$F(3,143) = 5.4$, $p = 0.002$

[SD, standard deviation; significances show the *t*-tests compared to the mean scale value of the general student population (in the first column in brackets), and statistics of the MANOVA in each scale across the study subject and program].

of these subscales contains three items. The scale ranges from 1 ("not true at all") to 7 ("completely true").

(1) The *intrinsic* motivation scale includes items that relate to the content of the subject. University students assess whether they enjoy studying the content of the subject and find it interesting. They also assess whether the subject matches their abilities and talents. (2) The *extrinsic-materialistic* scale relates to financial aspects. University students assess whether they have chosen their studies in order to earn well, to be financially secure and to have a secure income later on. (3) The *extrinsic-social* scale focuses on the compatibility of work and family, friends, and hobbies. For example, university students are asked whether they chose their degree course in order to be able to look after their family alongside their career. (4) The *socially induced* scale refers to relevant other people who encouraged the university students to choose their course of study. The items ask about friends, family and people with whom the students have worked and who think they should choose their study degree program. (5) In addition to more established facets of study motivation, the STUWA also makes it possible to record the degree of *uncertainty* of the study choice. Students choose their degree course because they are not sure what career they would like to pursue later, they do not know exactly which degree course suits them, or they are generally unsure which degree course is right for them. For each scale, the mean scale values of a general student population taken from Janke et al. (2023) were used for a comparative analysis.

3.3.2 Aspects of importance in the profession

The students were asked to what extent certain aspects of their future profession are important to them. With the question "What is important to you for your future profession?" six aspects had to be rated on a four-point scale from 1 ("not important") to 4 ("very important"). These aspects were: personal interest, good job prospects, good earning opportunities, career opportunities, social reputation, and the continuation of an already started education. This range of aspects was also used in other student surveys, and the results of some aspects in the general student survey 2022 (Hinz, 2022) were used for comparison.

3.4 Statistics

The analyses were carried out with SPSS 29 (Armonk, NY: IBM Corp). Descriptive statistics include the mean value and the standard deviation (SD) of the mean. Nonparametric comparisons were examined using cross tables reporting Pearson's χ^2. *T*-Tests (single-sided) were used between the mean scale value and the value of the scale in the general student population. Multivariate analysis of

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variance (MANOVA) was used for the comparative analyses with all STUWA scales between the study subjects and program. On significance, *post hoc* analysis was performed using Tukey-HSD correction. The level of significance was set to $p = 0.05$.

4 Results

4.1 Motivation for enrollment (STUWA)

The mean values of the STUWA scales by study subject and study program are listed in Table 2.

The results showed no significant difference among university students in the scale *intrinsic* motivation to study. However, the music students had significantly higher mean values compared to the mean value of this scale in the general student population.

There was a significant main effect in the mean values among university students for *extrinsic-materialistic* motivation to study, particularly between students in the bachelor and those in the teacher education program. Bachelor students in both study subjects had significantly lower scores than the teacher education students (*post-hoc*, $p < 0.032$) and compared to the general student population. The student teachers tended to show similar values to the general scale value.

In the *extrinsic-social* motivation scale, the significant main effect between the university students was similar to the extrinsic-materialistic scale especially caused by the differences between the bachelor and teacher education students (*post-hoc*, $p < 0.033$). While the bachelor students had a lower but similar mean value than the general student population, the teacher education students showed significantly higher values.

The mean values in the *socially induced* scale did not differ among the university students. However, with the exception of the sports students in the Bachelor of Science program, the values were significantly higher than in the general student population.

There was a significant main effect among university students in the scale of *uncertain* choice of study, which was mainly caused by the low mean value of the music students in the Bachelor of Music program (*post-hoc*, $p < 0.015$).

4.2 Biographical background and professional importance

The average age at which the decision for studying music or sport was made differed significantly among the university students [Figure 2; $F(3,147) = 12.5$, $p < 0.001$]. The music university students in the Bachelor of Music program were the earliest to make this decision (*post-hoc*, $p < 0.013$).

With regard to the question of whether the students had an alternative to study music or sport, there was a significant difference in the distribution of responses (Figure 3; $Chi^2 = 18.3$, $p = 0.032$). The music students in the Bachelor of Music program had less of an alternative in mind than the sport students in the Bachelor of Science program.

When asked what is important to the students for their future profession, the students answered rather similarly, regardless of the study subject and study program (Figure 4). Most of all, personal interest was rated highest of all with 78% being very important. Regarding the good earning opportunities, the music and sports students rated this aspect less important, with 14%. The only significant distribution differences in these job aspects between the university students in music and sport were found for career opportunities [$Chi^2 = 37.2$, $p < 0.001$] and in continuing an already started education [$Chi^2 = 19.5$, $p = 0.021$]. The music students in the Bachelor of Music program and the sport students in the Bachelor of Science program rated career opportunities as

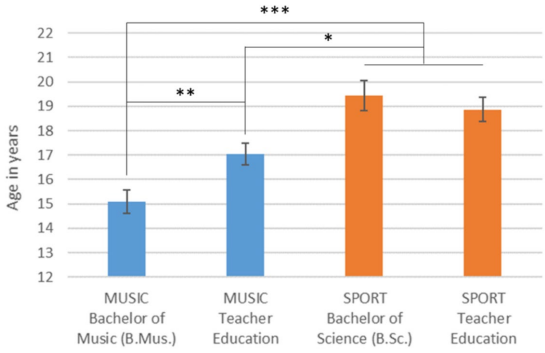

FIGURE 2
Mean age of deciding to study music or sport by study subject and program (error bars: standard error of the mean. *$p < 0.05$; **$p < 0.02$; ***$p < 0.01$).

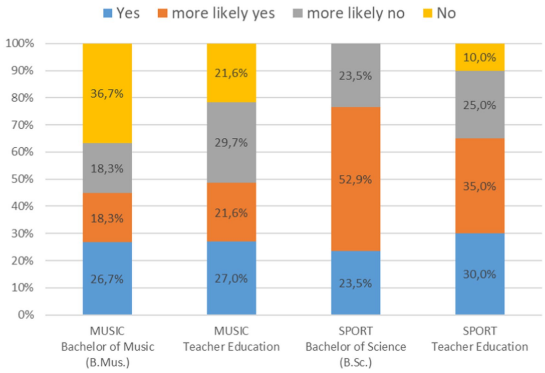

FIGURE 3
Histogram of the answers to the question if the university students had an alternative to study music or sport.

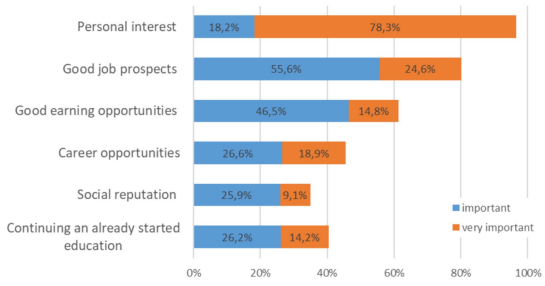

FIGURE 4
Distribution of the answers to specific job-related aspects across all students to the question, What is important for the future profession?

more important (important to very important >60%) than the teacher education students (about 20%). The continuation of an already started education was most important for the music students in the Bachelor of Music program (important to very important 56%) in comparison with the other university students (<30%).

5 Discussion

In this project, the study motivation of music and sport students at their beginning of their study at the University of Freiburg and the University of Music Freiburg was examined. The results showed that there are many similarities between music and sport university students, but also differences with regard to the study programs within the subjects.

5.1 Students' study motivation

Both music and sport university students had a similarly high intrinsic study motivation. The level of intrinsic motivation seems to underline their passion and commitment to their respective field. This result is in line with the findings of Bornhorst et al. (2020) on high study motivation over all university students with a high level of commitment to the subject. It was found in our study that the intrinsic motivation of sports students was similar to that of the general student population whereas that of the music students was higher. Other studies have also shown high levels of intrinsic motivation in sport students (Fischer and Bisterfeld, 2015; Fischer and Golenia, 2021), which is particularly pronounced in teacher training students for secondary school (Retelsdorf and Möller, 2012; Streblow and Brandhorst, 2018; Grüneberg and Süß, 2023) and corresponds therefore partly to the sample in this study. Studies among music university students show that intrinsic motivation is an effective determinant of career intentions and decisions (Wang and Wong, 2022; Hatfield, 2024) and is strongly associated with higher intentions to pursue a music career (Miksza et al., 2021), which could explain the higher intrinsic motivation.

In terms of extrinsic-materialistic motivation, a difference is particularly evident between the different study programs. Thus, materialistic goals motivated the teacher training students more than the bachelor students in the artistic-oriented study program. In this case, the student teachers seem to correspond to type 3, according to Bornhorst et al. (2020), who increasingly cite external study motivations such as a good income and a permanent position. Nevertheless, these teacher training students differ greatly from other groups, such as business students, who choose their studies out of an extrinsic-materialistic motivation to a much greater extent than students of other subjects (Janke et al., 2023). On the other hand, it is interesting to note that a lucrative future played less a role for the bachelor students in music and sport equally. This finding can possibly be explained by the prospects of the two future professions. Despite the different requirements in the subjects of music and sport, the teaching profession is a clearly defined field of activity with a manageable structure, secure career prospects and a regular income. This result presumably reflects the desire of student teachers for financial security. However, the professional field and area of activity following a bachelor degree in music and sport is less clearly defined compared to the teaching profession. It can only be assumed that the students are aware of this uncertainty, have nevertheless decided to study music and sport, and are open to various career prospects. It can be stated that the differentiation of materialistic goals between teacher training students and bachelor students provides important insights into the different priorities and professional expectations within the two subjects.

The difference between study programs was also found for the extrinsic-social scale where the teacher training students answered with higher scores regarding the wish to support a private and a family life with the future profession. This is consistent with the results of Grüneberg and Süß (2023) and Janke et al. (2023), in which student teachers stated that the compatibility of family and career was important to them and that the teaching profession offered good employment opportunities, flexibility, free time, and compatibility with family life. Weiß and Kiel (2010) found that the integration of work and family was less important for student teachers of music, but this is not reflected in our data as a subject-specific difference between music and sport and students of other subjects. It seems that the teacher students like to see a secure future and regard the teaching profession as such, where the bachelor students did not foresee the upcoming profession and initially the study itself was the main and most important motivational target.

With regard to socially induced study motivation, it was shown that music students and sports teacher training students were more socially induced to study their subject compared to the general student population. This high socially induced study motivation was also reported by student teachers in other studies (Pohlmann and Möller, 2010; Janke et al., 2023), which means that these students decided to study because they were encouraged by friends, family, or colleagues. This seems to be an important result, especially for music-related studies, as it is known from other studies that instrumental teachers and the family environment (Váradi et al., 2024), the school music context in secondary school (Guan et al., 2022), or music teachers as relevant others (Thornton and Bergee, 2008) can influence the decision to study music. In addition to the musical and sporting basics and skills that must be learned for the two subjects, these relevant others also seem to be decisive in the biographical path of students and ultimately their choice of study.

In this regard, the scale uncertainty of the study choice showed that the Bachelor of Music students were less uncertain that they wanted to study exactly this subject than the other students of the sample. However, student education teachers in music indicate more uncertainty with regard to their choice of study compared to student teachers of other subjects (Janke et al., 2023). It suggests that this is not a music-specific phenomenon, but could be a special characteristic of the Bachelor of Music degree program. In terms of data, these students choose their degree course because they are sure that they want to make music – highly intrinsically motivated – and want to specialize in their instrument or with their voice, and because they know that this study program suits them and is right for them. Both the differences in extrinsic-social motivation and certainty in course choice, provide insight into how social contexts and prior experiences influence students' academic decisions.

5.2 Biographical background in music or sport and importance in the profession

Based on the literature, a wide range of biographical experiences (Volkmann, 2008; Lüsebrink et al., 2014; Bornhorst et al., 2020; Immerz and Tralle, 2022) and an early and intensive involvement with music (Nagel, 1988; Manturzewska, 2006; Spahn, 2015) and sport (Klinge, 2002; Miethling, 2018; Wylleman, 2019; Wyllemann et al., 2020) can be identified as similarities between both areas. These aspects can also be found in the data of our study.

On the one hand, it was shown that both groups – music and sport students – began their activities with instrumental practice or sport training at around the same time, at an average age of 6.5 years. Thus, it can be assumed that these activities are related to the school age in the German school system and that the transition from kindergarten and entry into primary school is therefore framed by extracurricular activities such as instrumental lessons or joining a sports club. On the other hand, there is an interesting difference in terms of age and entry to university or university of music. Music university students in their first year of study are on average 1 year younger than sports university students. However, they were not only younger when they started their studies, but also decided to study music much earlier than the sports students did. What music and sport have in common is that many years of previous experience and intensive preparation are necessary in order to be able to make the decision to study music or sport in order to get a place at university or university of music. The "staircase" in Figure 2 indicates that a high degree of specialization is taking place in music, which is reflected in the early decision to study. This is probably also related to the format of the entrance exam in both subjects. While an enormous range is tested in sport for Bachelor of Science and teacher training, the examination format for a teacher education degree in music focuses on far fewer areas. The specialization on one main instrument becomes very clear in relation to the Bachelor of Music degree course. These findings that music students show less uncertainty in their choice of major and make this decision at a younger age compared to sport students enrich the understanding of the academic cultures of music and sport, but also suggest potential areas for future comparative studies with other study programs and disciplines.

In the question of whether the university students had an alternative to study music or sport, it was found that the music students in the Bachelor of Music had fewer alternatives in mind than the sport students in the Bachelor of Science. Following Nagel's (1988) argument, an early specialization in one instrument and an early focus on a career in music can also limit non-musical alternatives in the study choice. This is also reflected in this data for Bachelor of Music students in their early decision to study. Based on the data available, it is not possible to answer whether the students have decided on a profession for which they are aiming with their studies or have merely decided to study and are open to alternative career options (Neuhaus, 2007; Parkes and Jones, 2012; Rickels et al., 2019). When asked about study alternatives, the results for student education teachers in music and sport differ from those in other subjects. For teacher training students of all subjects, nearly 88% said that teacher education is the preferred choice of study (Grüneberg and Süß, 2023) and also in music, students consciously chose music as a teaching subject (Neuhaus, 2007). The data of this study is less homogeneous. While 51% of students in the music teaching degree stated that they had more likely no or even no alternative, for teaching education in sport this figure was 35%. In contrast, there are almost 49% of university students with an alternative in music and as many as 65% of university students with an alternative in sport. One explanation here could also be the much broader focus in sport compared to the focus on one main instrument in music. However, for further statements as to whether these are subject-specific characteristics, further studies would have to be carried out.

Among the students' answers as to what is important for their future profession, there is no difference concerning the study subject or study program. Most of all, personal interest was rated highest of all with 78% being very important. This was very similar to the answers of other students studying humanities (78%) and cultural sciences (75%) but different to law students (38%) and business science students (35%) (Hinz, 2022). Regarding the good earning opportunities, the music and sports students rated this aspect less important, similar again with the students of cultural (15%) and literature sciences (18%), and in contrast to the law (51%) and engineering/computer science students (48%). This can also be seen in other studies with the STUWA (Janke et al., 2023), in which business students choose their studies out of extrinsic-materialistic motivation with the aim of earning well later on, being financially secure, and having a good income.

5.3 Limitation and future research

The limitations of the study are mainly due to the relatively small sample size. Thus, the results and implications can only be generalized with reserve, especially as this was a group from one University of Music and one University.

There are numerous starting points for further studies. It would be interesting to differentiate more precisely between certain areas such as teaching education and bachelor degrees and possibly the academic and family background of university students in music and sport. The question of whether the subjects of music and sport are associated with more enthusiasm, interest, or professional motivation than other subjects (Kaub, 2015) cannot be answered conclusively on the basis of the present data. However, there are indications that this is the case for music, especially for students on artistic degree courses. In this regard, an in-depth investigation of the study motivation of traditional and non-traditional students (Brändle, 2014) in music-related degree programs could also be interesting.

Within the subject of music, future research on students' motivation to study in relation to different musical specialties would certainly offer potential. This is particularly interesting in light of the changing musical landscape, the emergence of new professional fields and the increase in musicians' portfolio careers. A comparison with other subjects would also be desirable. For this purpose, the STUWA questionnaire (Janke et al., 2023), as inventory to measure study motivation, should also be used in other subjects and study programs in order to obtain comparative material. In addition to the university students who have decided to study music or sport, there are many teenagers and young adults who are intensively involved in music or sport and are very

interested in these areas, but do not decide to study these subjects. It would be interesting to include this group in further studies in order to understand the reasons why young people choose another subject of study over music or sport.

6 Conclusion

In the present study, students' motivation to study music and sport was examined and for the first time compared between the subjects and of different study programs within the subjects. The engagement with the subject content – learning an instrument or training in a sports club – begins early in childhood for students in both subjects. Another similarity is that music and sports students are equally or more intrinsically motivated than students in other subjects. What is particularly interesting, however, is that there are differences in the subjects depending on the study program, as the bachelor students in music (Bachelor of Music) and sport (Bachelor of Science) differ from the teacher education students in music and sport. Thus, extrinsic-materialistic and extrinsic-social motivation is higher among teacher training students than bachelor students. There is a subject-specific difference in the younger age of first-year-students in music, the earlier decision to study music and the fewer study alternatives of bachelor of music students. In addition to other studies on students' motivation for study choice decision, their motivation of enrollment and their study major choice, the focus on the subjects of music and sport and the comparison provides interesting insights into these subject cultures.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study has received a positive vote from the ethics committee of the University of Music Freiburg. Consent to participate in this study was provided by the participants.

Author contributions

AI: Conceptualization, Project administration, Writing – original draft, Writing – review & editing. MN: Conceptualization, Data curation, Formal Analysis, Project administration, Methodology, Writing – original draft, Writing – review & editing. JH: Conceptualization, Methodology, Writing – review & editing. CS: Conceptualization, Writing – review & editing, Supervision.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. We acknowledge support by the Open Access Publication Fund of the University of Freiburg.

Acknowledgments

We thank Prof. Dr. Jana Strahler, Head of the Chair of Sports Psychology at the Institute of Sport and Sports Science at the University of Freiburg, for her support in this study and Charlotte Eckler for proofreading the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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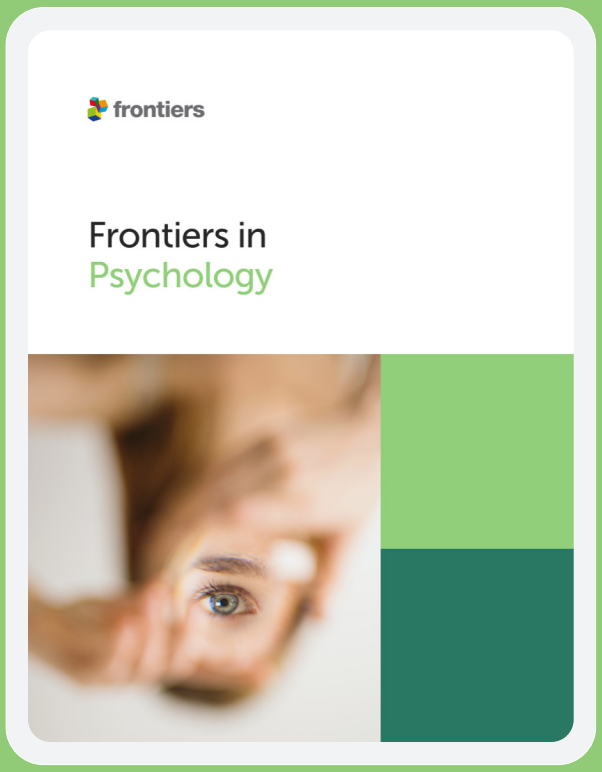

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