Per Musi

eISSN 2317-6377

Exploring engagement and flow experiences in collective music practices of amateurs, students and professional musicians

Explorando o engajamento e as experiências de fluxo nas práticas musicais coletivas de músicos amadores, estudantes de música e músicos profissionais

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SCIENTIFIC ARTICLE
Section Editor: Fernando Chaib
Layout Editor: Fernando Chaib
License: "CC by 4.0"

Submitted date: 27 jul 2024
Final approval date: 14 sep 2024
Publication date: 01 oct 2024
DOI: https://doi.org/10.35699/2317-6377.2024.53731

ABSTRACT: The purpose of this research was to explore the engagement and flow experiences in collective music practices of amateurs, students, and professional musicians. Based on the first phase of a sequential explanatory mixed methods research design, this article presents the results obtained from an online survey with 102 participants from diverse collective music practices. The results obtained were analyzed using both descriptive and inferential statistics. Some statistically significant differences were observed in the interaction between participant groups (amateurs, students, and professionals) and dimensions of engagement (behavioral, cognitive, and emotional), as reported in the results and discussed in relation to the literature. In summary, we were able to explore and discuss some aspects of engagement, motivation, and flow experience based on the participants' responses regarding their collective music practices.
KEYWORDS: Engagement; Flow; Motivation; Collective music practices; Music ensemble.

RESUMO: O objetivo desta pesquisa foi explorar o engajamento e as experiências de fluxo em práticas musicais coletivas de músicos amadores, estudantes de música e músicos profissionais. Com base na primeira fase de uma pesquisa de métodos mistos sequencial explanatória, este artigo apresenta os resultados obtidos a partir de um *survey on-line* com 102 participantes de diversas práticas musicais coletivas. Os resultados obtidos foram analisados utilizando tanto estatísticas descritivas quanto inferenciais. Algumas diferenças estatisticamente significativas foram observadas na interação entre os grupos de participantes (amadores, estudantes e profissionais) e as dimensões de engajamento (comportamental, cognitivo e emocional), conforme relatado nos resultados e discutido a partir da literatura. Em resumo, foi possível explorar e discutir alguns aspectos do engajamento, da motivação e da experiência de fluxo com base nas respostas dos participantes sobre suas práticas musicais coletivas.
PALAVRAS-CHAVE: Engajamento; Fluxo; Motivação; Práticas musicais coletivas; Grupo musical.

1. Introduction[1]

Numerous studies discuss the importance of understanding student engagement and its motivations and indicators. In this sense, engagement is understood as active participation in an activity that is determined by the quality of behavioral and psychological (cognitive and emotional) dimensions of an individual's experience when performing an action (e.g., Fredricks *et al*. 2004; Rose-Krasnor 2009; O'Neill 2012; Reeve 2018; Reschly and Christenson 2022). The literature commonly presents three dimensions of engagement and its indicators: (1) behavioral engagement (e.g., frequency, intensity, duration, and actions performed in an activity); (2) cognitive engagement (e.g., seeking strategies, thinking and reflecting on activities, and preference for challenge); and (3) emotional engagement (e.g., interest, enjoyment, and sense of belonging) (Christenson *et al*. 2012). Reschly and Christenson (2012) argue that one of the most prominent discussions revolves around the dynamic relationship between motivation and engagement: while the former concerns what moves an individual towards an action, the latter concerns active participation. When addressing the debate on the relationship between motivation and engagement, Bempechat and Shernoff (2012) highlight that deep engagement can be related to flow experiences since it involves elements such as concentration, interest, and enjoyment. This approach enables the understanding of motivational pathways that lead to engagement, which can be qualified as deep engagement when characterized as a flow experience (Csikszentmihalyi and Hermanson 1995; Shernoff 2013).

The flow experience can be understood as a state in which individuals are deeply engaged in an activity and experience a high level of concentration and enjoyment in the task. Csikszentmihalyi (1990) identifies nine characteristics of the flow experience: challenge-skill balance, action-awareness merging, clear goals, feedback, concentration on the task, a sense of control, loss of self-consciousness, transformation of time, and autotelic experience. Csikszentmihalyi (1990) highlights that one of the most commonly reported activities in flow experiences is socialization, and music is closely intertwined with our social connections with others. In this regard, recent studies indicate that collective flow can be a shared experience among individuals within a group (Walker 2010; Salanova *et al*. 2014; Sawyer 2017; Pels *et al.* 2018). Tay and colleagues (2021) assert that studying flow based on individual experiences can serve as a foundation for understanding collective flow. However, the authors emphasize that collective flow is not simply the sum of individual parts, and it emerges from a collective sharing dynamic that needs to be considered in research.

In this study, musical engagement is understood as the active participation in a musical activity that is determined by the quality of behavioral and psychological (cognitive and emotional) dimensions of an individual's experience when performing a musical action. There is a recent literature investigating the role and presence of musical engagement in different contexts of music making, listening, teaching, and/or learning (e.g., Lamont 2012; O'Neill and Senyshyn 2012; Beineke 2015; Richmond *et al*. 2016; Joseph and Southcott 2017; Chen and O'Neill 2020; Toni 2023, 2024; Toni and Araújo, 2023). Furthermore, researchers have been adopting the flow theory

[1] This work was financed by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Fundação Araúcária and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

to discuss elements related to the engagement of students and musicians in their musical practices (e.g., Custodero 2005; Lamont 2012; O'Neill 2012, 2016; Croom 2015). Elliott and Silverman (2015) state that enjoyment can emerge from active musical engagement in musicing and listening, actions that can be closely related to the flow experience, both at an individual and collective level. Therefore, collective flow has also been a relevant approach, considering engagement in studies on collective music practices (e.g., Hart and Di Blasi 2015; Gaggioli *et al*. 2017; Sawyer 2017).

Musical activities are immersed in a collective social dynamic negotiated by individuals' engagements in their actions (Small 1998; Mithen 2005; Olsson 2007; O'Neill 2012; Elliott and Silverman 2015; Savage *et al*. 2021). Furthermore, engagement and flow are subjective experiences that can occur in collective music practices and are reported by ensemble musicians (Hart and Di Blasi 2015; Elliott and Silverman 2015; Gaggioli *et al*. 2017; Sawyer 2017). The current study addresses the self-reported musical engagement and flow experiences of ensemble musicians in their practices. In this sense, the purpose of this research was to explore the engagement and flow experiences in collective music practices of amateurs, students, and professional musicians.

2. Method

A sequential explanatory mixed methods design was employed in the research project associated with this article[2] (Wise 2014; Creswell and Plano Clark 2017). In the first phase of a sequential explanatory mixed methods project, the primary goal is to explore the research aims using quantitative data. Accordingly, this article employed a survey as the method for the initial phase of the study, given its common usage in describing characteristics present among a group of individuals (Cohen *et al*. 2007).

2.1. Participants and contexts

In this research, a non-probabilistic sampling method was employed, intentionally selecting individuals from three distinct participant groups (Cohen *et al*. 2007). The three intentionally selected participant groups consisted of: (1) *amateur musicians*, those who participate in music ensembles without pursuing music as a profession or holding a degree in music; (2) *music students*, those who participate in music ensembles and are currently pursuing an undergraduate degree in music; and (3) *professional musicians*, those who participate in music ensembles and rely on music as their primary source of income. The selection of these participant groups was based on the opportunity to understand how individuals from diverse music backgrounds perceive their collective music practices. Furthermore, the contexts of collective music practice were voluntarily chosen by the participants, which can be relevant for investigating engagement in an activity. This is because the reports can better express indicators that assist in assessing and characterizing engagement in voluntary activities (Shernoff 2013; Ramey *et al*. 2015; Fredricks 2011; Ryan *et al*. 2019). However, it was not possible to control for a variable where

[2] This research was approved by the Ethics Committee of the Federal University of Paraná (Brazil) under the code CAAE 46763121.4.0000.0102.

only highly engaged individuals responded to the questionnaire in such voluntarily chosen contexts.

The research involved 102 participants (34 in each participant group). Regarding the participants' gender, 67 described themselves as cisgender men, 34 as cisgender women, and one as other gender. They were between 18 and 59 years old (*M* = 29.5. *SD* = 10.7).[3] In terms of educational background, 46 participants completed high school, 29 completed undergraduate studies, and 27 pursued postgraduate studies. Nineteen participants reported not having any musical education, while 83 participants reported having a music education background that included general music and instrumental classes, undergraduate music degrees, and/or postgraduate music degrees.

Participants' collective music practices varied as follows: 44 in bands, 21 in orchestras, 18 in choirs, nine in marching bands, five in percussion ensembles, and five in other types of music groups. Collective music practices with up to five individuals were predominant (37 participants) in this research, but there were also reports of participation in collective music practices with more than 20 individuals (28 participants), five to 20 individuals (19 participants), and over 50 individuals (18 participants). The majority of participants reported that their collective music practices were located in the Southern region of Brazil. Additionally, there were no participants from the Northern region of Brazil and some participants reported remote music practices. The reasons for participating in the collective music practice were categorized into six groups: personal identification with the practice, interest in learning music, remuneration or work, professional development, leisure, and/or social interaction.

2.2. Measures and materials

An online questionnaire was sent to the participants. The first section of the questionnaire comprised an introduction to the research and gathered information about participant characteristics and their collective music practices. The second section of the questionnaire comprised a list of statements concerning behavioral, cognitive, and emotional engagement, as well as the characteristics of flow experience (Table 2). Participants were asked to rate their agreement with each statement using a five-point scale, ranging from 0 (strongly disagree) to 4 (strongly agree). The authors developed this list of statements in Brazilian Portuguese, considering the existing construct (engagement and flow) operationalization in the consulted literature (e.g., Busseri and Rose-Krasnor 2008; Shernoff 2013; Ramey *et al*. 2015; Richmond *et al.* 2016; O'Neill and Senyshyn 2012; Fredricks, Parr *et al.* 2019; Chen and O'Neill 2020). Considering the diverse operationalization of engagement across studies, the validation of construct coherence with existing literature holds significance when defining and enumerating items to formulate a data collection instrument that aligns with the construct delineated in scholarly discourse and the theoretical framework under consideration (Cohen *et al*. 2007; Betts 2012). In this sense, the overlaps between flow and engagement were considered in the research, and flow theory was considered as a theoretical framework that enables the understanding of

[3] Some additional information about the participants' ages may be relevant. *Amateur musicians*, they were between 18 and 50 years old (M = 25.8. SD = 8.4). *Music students*, they were between 18 and 42 years old (M = 24. SD = 5.8). *Professional musicians*, they were between 23 and 59 years old (M = 38.8. SD = 10.7).

motivational pathways that lead to engagement, which can be qualified as deep engagement when characterized as a flow experience (e.g., Csikszentmihalyi and Hermanson 1995; Shernoff and Csikszentmihalyi 2009; Steele and Fullagar 2009; Bempechat and Shernoff 2012; Shernoff 2013). Cronbach's alpha indicated a good internal consistency of the list in the pilot study (α = 0.71) and in the total sample of participants (α = 0.83).[4]

2.3. Procedures

Given that this is a sequential explanatory mixed methods study with an exploratory first phase, the participant recruitment procedures occurred through purposive (participant groups) and voluntary non-probabilistic sampling methods (Cohen *et al*. 2007; Creswell and Plano Clark 2017). The questionnaire was sent to the participants through social media platforms and e-mail. Participants were contacted with information about the research and the Informed Consent Form. They were also provided with a link to access the online questionnaire and were given the opportunity to ask any questions related to their participation in the research. Participants were invited to take part in the research while ensuring the security of their response information and the voluntary nature of their participation in the study. Contact information for research participants was accessed from publicly available sources, such as music ensemble websites (e.g., choirs and orchestras), social media platforms, and e-mail lists. Throughout the data collection process, the obtained responses were continuously monitored in order to balance the number of individuals in each participant group.[5]

2.3. Analysis

The questions concerning the characterization of participants and the contexts of collective music practice (presented in the participants and contexts section) were analyzed using descriptive statistics and a categorical content analysis procedure (Bardin 2016). The data collected through the list of statements related to engagement and flow experience were analyzed using descriptive and inferential statistics (presented in the results section). The Kolmogorov-Smirnov and Shapiro-Wilk tests indicated that the data from the list did not follow parametric distributions. Similarly, the Levene's test indicated that there was no homogeneity of variances in some of the data distributions. Consequently, Friedman and Kruskal-Wallis tests were conducted to examine the main effect on the participants' responses, considering dimensions of engagement and participant groups. Pairwise comparisons were also conducted to identify statistically significant differences. Statistical differences were considered significant when the calculated *p* values were below 0.05. Bonferroni correction was applied in multiple comparisons and reported in the results.

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[4] Cronbach's alpha was also calculated for each dimension of engagement in the total sample of participants (N = 102): behavioral engagement (α = 0.61), cognitive engagement (α = 0.52), and emotional engagement (α = 0.80).

[5] Upon reaching a total of 34 participants for music students and professional musicians, it was necessary to exclude three participants from the amateur musician group in order to maintain a balance in the size of the three groups. The exclusion criterion was based on participants' self-reports not identifying themselves as amateur musicians. The same verification was carried out in the self-reports of music students and professional musicians.

3. Results

The results section presents descriptive and inferential statistics derived from the list of statements (engagement and flow), organized as follows: (1) general comparisons between dimensions of engagement and participant groups; and (2) comparisons between each statement and participant groups.

3.1. General comparisons between dimensions of engagement and participant groups

Table 1 presents the descriptive statistics of engagement distributed in general mean values and separated into behavioral, cognitive, and emotional dimensions for all participants, amateur musicians, music students, and professional musicians.

Tab. 1 – Descriptive statistics of engagement distributed in general mean values and separated into behavioral, cognitive, and emotional dimensions for all participants, amateur musicians, music students, and professional musicians

	ALL (N = 102)		AMATEURS (N = 34)		STUDENTS (N = 34)		PROFESSIONALS (N = 34)	
ENGAGEMENT	M	SD	M	SD	M	SD	M	SD
General mean values	3.51	0.54	3.51	0.48	3.44	0.61	3.58	0.51
Behavioral	3.76	0.34	3.66	0.38	3.74	0.35	3.87	0.27
Cognitive	3.31	0.55	3.32	0.52	3.21	0.66	3.39	0.45
Emotional	3.46	0.59	3.55	0.49	3.35	0.66	3.47	0.62

***Note*. M = Mean. SD = Standard Deviation. N = Number of participants**

As presented in Table 1, the mean values for engagement were high across all participant groups, considering that the data was collected on a scale ranging from 0 to 4. When considering the three participant groups, the highest general mean value was observed for behavioral engagement, followed by emotional and cognitive engagement. In the comparison of the general mean values for engagement among the three participant groups (amateurs, students, and professionals), the Kruskal-Wallis test indicated that there was no statistically significant difference [$\chi^2(2) = 1.818$. $p = 0.403$]. In the comparisons of the general mean values for the dimensions of engagement (all participants: behavioral, cognitive, and emotional), the Friedman test indicated a statistically significant difference in the participants' responses [$\chi^2(2) = 67.497$. $p < 0.001$]. In this regard, the multiple pairwise comparisons indicated statistically significant differences between: (1) behavioral and cognitive engagement ($p < 0.001$); (2) behavioral and emotional engagement ($p < 0.001$); and (3) emotional and cognitive engagement ($p = 0.017$). Figure 1 presents the mean values for the dimensions of engagement (behavioral, cognitive, and emotional) in interaction with the participant groups (amateurs, students, and professionals).

Considering Table 1 and Figure 1, the inferential statistics are described based on between- and within-group comparisons. In the between-group comparisons, the Kruskal-Wallis test indicated a statistically significant difference among the responses of the three participant groups in relation to *behavioral engagement* [$\chi^2(2) = 8.865$. $p = 0.012$]. In this regard, the multiple pairwise comparisons test indicated only one statistically significant difference in the comparison of responses for behavioral engagement between amateur and professional musicians ($p = 0.009$).

The Kruskal-Wallis test indicated that there were no statistically significant differences among the responses of the three participant groups for *cognitive engagement* [$\chi^2(2) = 0.392$. $p = 0.822$] and *emotional engagement* [$\chi^2(2) = 1.880$. $p = 0.391$].

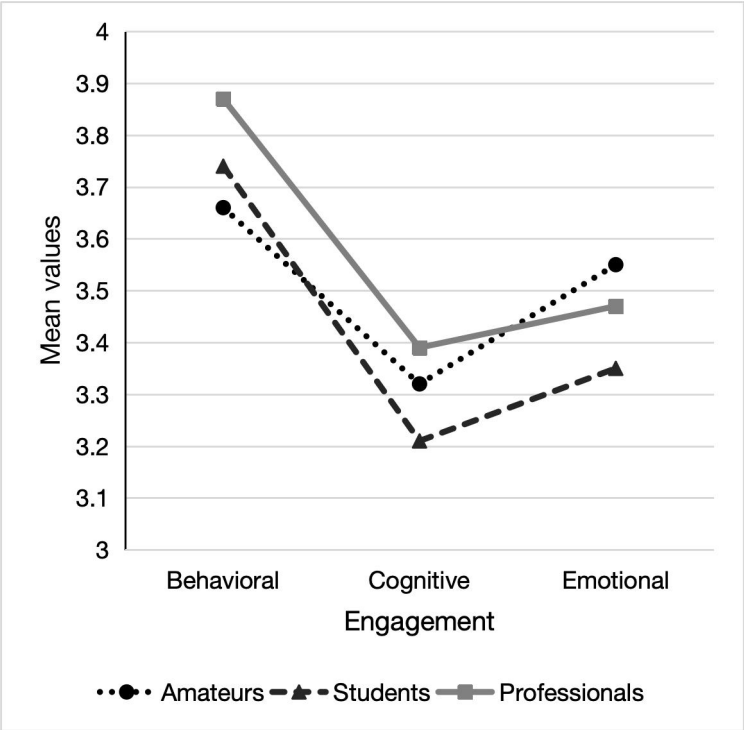

Figure 1 – Dimensions of engagement (behavioral, cognitive, and emotional) in interaction with the participant groups (amateur musicians, music students, and professional musicians)

Continuing to consider Figure 1 and Table 1, in the within-group comparisons, the Friedman test indicated a statistically significant difference among the dimensions of engagement in the responses of *amateur musicians* [$\chi^2(2) = 13.019$. $p < 0.001$]. In this regard, the multiple pairwise comparisons test indicated only one statistically significant difference in the comparison of responses between behavioral and cognitive engagement ($p < 0.001$) among amateur musicians. The Friedman test also indicated a statistically significant difference among the dimensions of engagement in the responses of *music students* [$\chi^2(2) = 25.096$. $p < 0.001$]. In this regard, the multiple pairwise comparisons indicated statistically significant differences between behavioral and cognitive engagement ($p < 0.001$) and between behavioral and emotional engagement ($p = 0.011$) among music students. Lastly, the Friedman test indicated a statistically significant difference among the dimensions of engagement in the responses of *professional musicians* [$\chi^2(2) = 35.009$. $p < 0.001$]. In this regard, the multiple pairwise comparisons indicated statistically significant differences between behavioral and cognitive engagement ($p < 0.001$) and between behavioral and emotional engagement ($p < 0.001$) among professional musicians.

3.2. Comparisons between each statement and participant groups

Table 2 presents the descriptive statistics derived from the list of statements (engagement and flow) for all participants, amateur musicians, music students, and professional musicians.

As presented in Table 2, the general mean values for the statements related to behavioral engagement were the highest, followed by the statements related to emotional and cognitive

engagement. An exception to this pattern occurred in the general mean values for statements 14 and 15 of emotional engagement, which had lower mean values compared to some statements of cognitive engagement. The Friedman test indicated a statistically significant difference among the statements based on the general mean values [$\chi^2(14) = 196.559$. $p < 0.001$]. In this sense, Table 3 presents the statistically significant differences in the multiple pairwise comparisons of the statements (engagement and flow) based on the general mean values.

Tab. 2 – Descriptive statistics derived from the list of statements (engagement and flow) for all participants, amateur musicians, music students, and professional musicians

	STATEMENT	ALL (N = 102)		AMATEURS (N = 34)		STUDENTS (N = 34)		PROFESSIONALS (N = 34)	
		M	SD	M	SD	M	SD	M	SD
BEHAVIORAL	S1 – I participate or have an interest in participating in this musical activity whenever it is held	3.83	0.42	3.79	0.41	3.79	0.54	3.91	0.29
	S2 – I really focus and concentrate on this musical activity when I am doing it	3.78	0.50	3.68	0.59	3.76	0.49	3.91	0.98
	S3 – I participate or have an interest in participating in this musical activity for a long period of time	3.63	0.73	3.62	0.70	3.59	0.74	3.68	0.77
	S4 – I ask questions and seek resources to improve my skills in playing an instrument (or singing) in this musical activity	3.70	0.64	3.44	0.82	3.73	0.62	3.94	0.24
	S5 – I keep trying to play/sing even when I have difficulties	3.84	0.44	3.79	0.54	3.82	0.46	3.91	0.29
COGNITIVE	S6 – I think this musical activity is challenging for me, but worth the effort	3.15	1.08	3.26	0.93	3.15	1.05	3.03	1.27
	S7 – I think I know what to do and I am encouraged to make my own choices about what and how to play	3.22	0.90	3.03	0.97	3.06	0.98	3.59	0.61
	S8 – I think I am good at this musical activity and I can contribute to my personal growth and the group growth	3.52	0.75	3.38	0.82	3.41	0.86	3.76	0.49
	S9 – I think about this musical activity even when I am not doing it	3.29	0.96	3.32	0.81	3.12	1.22	3.44	0.78
	S10 – I sometimes feel absorbed in the action when I am doing this musical activity that I lose track of time	3.37	1.01	3.65	0.64	3.32	0.98	3.15	1.28
EMOTIONAL	S11 – I enjoy this musical activity and I have fun when I am involved	3.77	0.56	3.85	0.43	3.76	0.55	3.70	0.67
	S12 – This musical activity gives me a sense of accomplishment and it would be very hard for me to give up this musical activity	3.47	0.87	3.50	0.75	3.29	1.09	3.62	0.74
	S13 – I feel a sense of belonging and connection to other people when I am doing this musical activity	3.64	0.67	3.65	0.60	3.56	0.82	3.70	0.58
	S14 – If I am doing this musical activity with other people, I feel they value it as much as I do	3.14	0.93	3.41	0.74	2.85	1.02	3.15	0.96
	S15 – If I am doing this musical activity with other people, I feel they are supportive and caring	3.28	0.93	3.35	0.88	3.29	1.06	3.20	0.84

***Note*. S = Statement. M = Mean. SD = Standard Deviation**

As presented in Table 3, the multiple pairwise comparisons indicated some statistically significant differences in the comparisons of statements (engagement and flow) based on the general mean values. It was observed that some of the statements related to behavioral engagement had

statistically higher mean values than three of the statements related to cognitive engagement, as well as some of the statements related to behavioral engagement had statistically higher mean values than two of the statements related to emotional engagement. It was also observed that some of the statements related to emotional engagement had statistically higher mean values than three of the statements related to cognitive engagement. Finally, it was observed that some statements related to emotional engagement had statistically higher mean values than two other statements within the same dimension of engagement. Figure 2 presents the mean values for each of the 15 statements (engagement and flow) in interaction with the participant groups (amateurs, students, and professionals).

Tab. 3 – Statistically significant differences in the multiple pairwise comparisons of the statements (engagement and flow) based on the general mean values

WITHIN-GROUP COMPARISONS (ALL PARTICIPANTS)									
BEHAVIORAL AND COGNITIVE ENGAGEMENT					**BEHAVIORAL AND EMOTIONAL ENGAGEMENT**				
Statement	**M**	**Statement**	**M**	***p***	**Statement**	**M**	**Statement**	**M**	***p***
S1	3.83	S6	3.15	**	S1	3.83	S14	3.14	***
S2	3.78			**	S2	3.78			***
S4	3.70			*	S3	3.63			**
S5	3.84			***	S4	3.70			***
S1	3.83	S7	3.22	***	S5	3.84			***
S2	3.78			***	S1	3.83	S15	3.28	**
S3	3.63			*	S2	3.78			**
S4	3.70			**	S4	3.70			*
S5	3.84			***	S5	3.84			***
S1	3.83	S9	3.29	*					
S2	3.78			*					
S5	3.84			**					
EMOTIONAL AND COGNITIVE ENGAGEMENT					**EMOTIONAL ENGAGEMENT**				
Statement	**M**	**Statement**	**M**	***p***	**Statement**	**M**	**Statement**	**M**	***p***
S11	3.77	S6	3.15	**	S11	3.77	S14	3.14	***
S11	3.77	S7	3.22	***	S13	3.64			**
S13	3.64			*	S11	3.77	S15	3.28	**
S11	3.77	S9	3.29	*					

***Note*. S = Statement. M = Mean. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$**

Considering Table 2 and Figure 2, the inferential statistics are described based on between- and within-group comparisons. In the *between-group* comparisons for each statement, the Kruskal-Wallis test indicated a statistically significant difference among the responses of the three participant groups only for statement S4 [$\chi^2(2) = 11.228$; $p = 0.004$], S7 [$\chi^2(2) = 8.856$; $p = 0.012$], and S14 [$\chi^2(2) = 6.631$; $p = 0.036$]. In the *within-group* comparisons for each statement, the Friedman test indicated a statistically significant difference among the responses of amateur musicians [$\chi^2(14) = 64.068$; $p < 0.001$], music students [$\chi^2(14) = 88.277$; $p < 0.001$], and professional musicians [$\chi^2(14) = 91.912$; $p < 0.001$]. Table 4 and Table 5 present the statistically significant differences in the multiple pairwise comparisons of the statements (engagement and flow) based on between- and within-group comparisons.

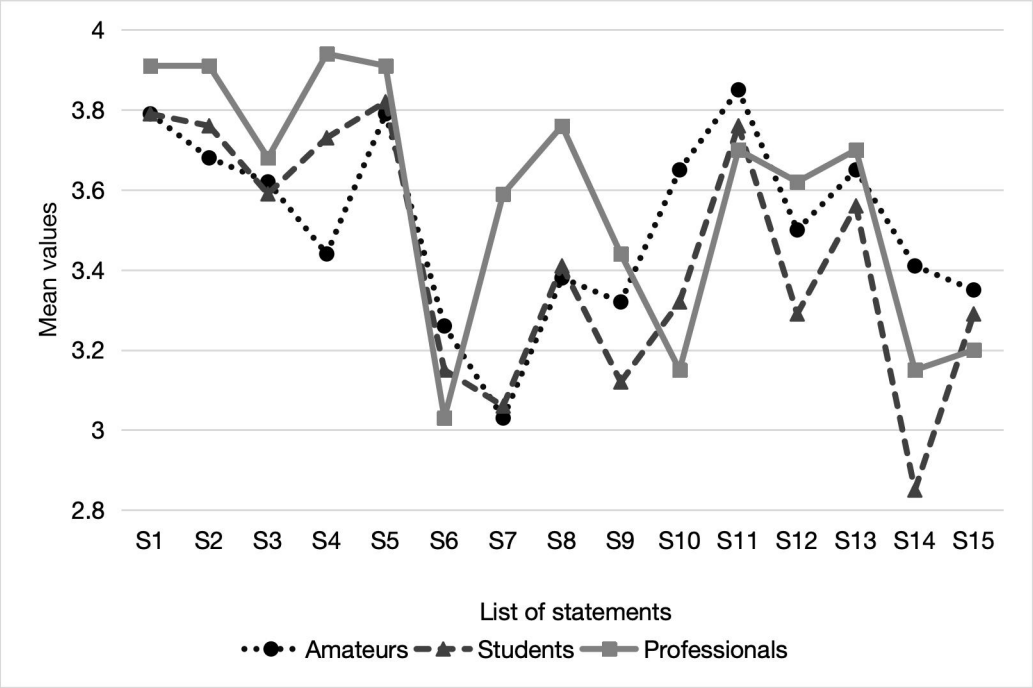

Figure 2 – Mean values for each of the 15 statements (engagement and flow) in interaction with the participant groups (amateur musicians, music students, and professional musicians)
***Note*. S = Statement**

Tab. 4 – Statistically significant differences in the multiple pairwise comparisons of the statements (engagement and flow) based on between-group comparisons

BETWEEN-GROUP COMPARISONS					
Statement	**Participant Groups**	**M**	**Participant Groups**	**M**	***p***
S4	Professionals	3.94	Amateurs	3.44	**
S7	Professionals	3.59	Amateurs	3.03	*
	Professionals	3.59	Students	3.06	*
S14	Amateurs	3.41	Students	2.85	*

***Note*. S = Statement. M = Mean. * *p* < 0.05. ** *p* < 0.01.**

Tab. 5 – Statistically significant differences in the multiple pairwise comparisons of the statements (engagement and flow) based on within-group comparisons

WITHIN-GROUP COMPARISONS									
STUDENTS					PROFESSIONALS				
Statement	**M**	**Statement**	**M**	***p***	**Statement**	**M**	**Statement**	**M**	***p***
S1	3.79	S14	2.85	**	S1	3.79	S14	3,41	*
S2	3.76			**	S2	3.68			*
S3	3.59			*	S4	3.44			*
S4	3.73			**	S5	3.79			*
S5	3.82			**	S2	3.68	S15	3,35	*
S11	3.76			**	S4	3.44			*
S5	3.82	S7	3.06	*					
AMATEURS									
Statement	**M**	**Statement**	**M**	***p***					
S1	3.79	S7	3.03	*					
S5	3.79			**					
S11	3.85			**					

***Note*. S = Statement. M = Mean. * *p* < 0.05. ** *p* < 0.01.**

As presented in Table 4 and Table 5, the multiple pairwise comparisons indicated some statistically significant differences in the comparisons of statements (engagement and flow) based on between- and within-group comparisons. In the *between-group comparisons*, it was observed that the mean value for: (1) statement S4 was statistically higher for professional musicians compared to amateur musicians; (2) statement S7 was statistically higher for professional musicians compared to both amateur musicians and music students; and (3) statement S14 was statistically higher for amateur musicians compared to music students. Regarding *amateur musicians*, in the *within-group comparisons*, it was observed that two statements related to behavioral engagement (S1 and S5) and one statement related to emotional engagement (S11) had statistically higher mean values than one statement related to cognitive engagement (S7). Regarding *music students*, it was observed that all five statements related to behavioral engagement and one statement related to emotional engagement (S11) had statistically higher mean values than one statement related to emotional engagement (S14). Additionally, it was observed that one statement related to behavioral engagement (S5) had a statistically higher mean value than one statement related to cognitive engagement (S7). Finally, regarding *professional musicians*, it was observed that four statements related to behavioral engagement (S1, S2, S3, and S5) had statistically higher mean values than one statement related to emotional engagement (S14). Additionally, it was observed that two statements related to behavioral engagement (S2 and S5) had statistically higher mean values than one statement related to emotional engagement (S15).

4. Discussion

This study contributes to exploring the engagement and flow experiences in collective music practices of amateurs, students, and professional musicians. In general, behavioral engagement showed the highest mean values in this research, especially due to its ease of description based on the actions performed by individuals in a task (Fredricks and McColskey 2012; Fredricks *et al*. 2019). This description of musical activities performed by individuals (related to behavioral engagement) can be found in research using questionnaires that provide a list of musical actions (e.g., Chin and Rickard 2012; Vanstone *et al.* 2016; Leung and Cheung 2020). Additionally, the measurement of engagement based on observable behaviors is also found in other studies that considered aspects of behavioral engagement to infer possibilities of cognitive and emotional engagement that may eventually lead to a flow experience (e.g., Custodero 2005; Beineke 2015; Wilson 2019). In this sense, behavioral engagement is revisited in the discussion of the results concerning its relationship with cognitive and emotional engagement.

The cognitive engagement showed some of the lowest mean values, which supports discussions in the literature about the challenges in measuring individuals' cognitive engagement in a task (Fredricks and McColskey 2012; Fredricks *et al*. 2019). Two statements related to cognitive engagement (challenges and efforts, and self-perceived skills; S6 and S7) had statistically lower mean values compared to statements related to behavioral and emotional engagement in both general and specific comparisons. The statements regarding challenges and skills (S6, S7, and S8) had similar mean values for amateur musicians and music students, although professional musicians reported slightly higher mean values for self-perceived skills compared to reports for challenges, as indicated by the descriptive statistics. The challenge-skill balance is crucial in a

flow experience, as well as in the actions of participants within a group during collective flow experiences (e.g., Walker 2010; Sawyer 2017). This study indicates a challenge-skill balance in the three participant groups, which is also reflected in reports of emotional engagement, considering that the feedback from the social process tends to have a shared emotional component within the group in collective flow, often achieved through the sharing of challenges, skills, and actions. In the case of professional musicians, their self-perceived skills (S7) showed higher mean values than amateur musicians and music students, and they also reported higher mean values of asking questions and seeking resources (S4) compared to amateur musicians, results that could indicate a dynamic process of seeking resources and increasing challenges to balance with their skills.

Some statements related to behavioral and emotional engagement (S1, S2, S5, and S11) showed higher mean values than the statement related to reflection on the activity in cognitive engagement (S9). The reflection on the activity tends to be difficult to measure, but the statistically significant differences found could be related to behavioral and emotional engagement as a way to describe some of the participants' cognitive processes. This can be observed when an individual performs an action that could be characterized as an extension of a previously completed task related to their cognitive reflections, which could also be related to aspects such as immersion and repetition of the task in a flow experience. In this regard, Custodero (2005) suggests, for example, that the extension or continuation of an action can be observed as a process of cognitive engagement in monitoring potential challenges in a flow experience. Other examples of research with children, adolescents, and adults indicate the presence of actions in the researcher's observations and participants' reports that represent the extension and continuation of an action, which could be related to cognitive engagement as a reflection on the activity (e.g., Beineke 2015; Hart and Di Blasi 2015; Toni 2023). At the same time, considering emotional engagement, Custodero (2005) states that the extension of an action that reflects possible cognitive aspects of reflection and challenge monitoring can represent a pursuit to continue the enjoyment derived from an activity. The enjoyment resulting from cognitive engagement is also described in other studies on subjective experiences of flow (e.g., Csikszentmihalyi 1990; Shernoff and Csikszentmihalyi 2009; Pekrun and Linnenbrink-Garcia 2012). Therefore, it is possible to propose a reflection on how behavioral and emotional engagement can assist in describing aspects of cognitive engagement, which reinforces the need to consider an interdependent relationship between the dimensions of engagement (e.g., Fredricks *et al*. 2004; Rose-Krasnor 2009; Christenson *et al*. 2012; O'Neill 2012, 2016; Fredricks *et al*. 2019).

In the comparisons between participant groups for cognitive engagement, professional musicians showed statistically higher mean value for the statement related to self-perceived skills (S7) compared to amateur musicians and music students. This statement is related to self-regulatory and metacognitive processes that enable the individual to develop more efficient cognitive strategies in a domain (Garcia and Dubé 2012; Hallam 2016; Veloso and Araújo 2017). Indeed, it is a relevant aspect of the literature on motivation and engagement, as it is also related to cognitive strategies for learning (Fredrick *et al*. 2004; Cleary and Zimmerman 2012). Furthermore, the literature indicates that musicians and individuals who are more experienced in their domains tend to possess higher levels of self-regulatory and metacognitive skills acquired through

experiences and processes of practice and learning over time (Ericsson and Pool 2016), this aspect is also present in the descriptions provided by professional musicians in this study regarding their musical background. Another implication of the literature regarding self-perceived skills is related to the potential of linking engagement with individuals' self-efficacy beliefs (e.g., Richmond *et al.* 2016; Kahu and Nelson 2018), as well as collective efficacy and collective flow (Salanova *et al.* 2014).

In this study, the amateur musicians reported that their interest and frequency of participation, efforts to persist in the task, and positive affective experiences of enjoyment (S1, S5, S11) were statistically higher than the statement regarding self-perceived skills (S7). Similarly, the music students reported that the statement regarding efforts to persist in the task (S5) was statistically higher than the self-perceived skills (S7). These statistical differences complement the discussions on self-regulatory and metacognitive processes, suggesting that both amateur musicians and music students showed higher mean values for behavioral actions compared to their self-perceived skills as a cognitive engagement. In this regard, there appears to be a developmental path in self-perceived skills (from amateurs to professional musicians) that can impact the pursuit of challenges and the extension of a task related to the individuals' cognitive reflections, considerations that were also described by Csikszentmihalyi (1996) in his investigations on flow, creativity, and individuals' self-perceived skills in different domains. For amateur musicians, when they start participating in a collective music activity, the emotional feedback from the social interaction can be an important aspect of their engagement and collective flow (Walker 2010), a situation that is also highlighted by MacRitchie and Garrido (2019) when describing some aspects of the behavioral and emotional engagement of amateur musicians. Emotional engagement, in turn, can contribute to reinforcing an individual's motivations to engage in an activity (Janosz 2012), which could influence a process of skill development (and their self-perceptions) over time through cognitive engagement, as observed in professional musicians. In this process, O'Neill (2012, 2016) asserts that understanding transformative music engagement enables us to consider development and learning in a way that involves a transformation in how individuals perceive a challenge and construct reflections on the development of their skills. The author states that this understanding implies reflecting on how musical development and engagement occur in practice, teaching, and learning for different individuals.

The emotional engagement showed a higher general mean value than cognitive engagement and a lower general mean value than behavioral engagement, with a similar pattern observed for some of the statements within this dimension of engagement. Corroborating research on individuals' engagement in music practice, teaching, and learning contexts, emotional experiences are often mentioned in relation to (1) motivational aspects that influence individuals' engagement, and in relation to (2) the subjective experience of engagement described in music practices (e.g., Lamont 2012; O'Neill and Senyshyn 2012; Leung and Cheung 2020; Toni 2023). Furthermore, social aspects such as social connection and a sense of belonging are also presented as relevant in the literature as antecedents and indicators of musical engagement (e.g., *Cross et al*. 2012; O'Neill 2012; Joseph and Southcott 2017), which can influence the development of a network of social and musical relationships (Juvonen *et al*. 2012; O'Neill 2017; Kahu and Nelson 2018).

The general mean values of the statements related to behavioral engagement and the emotional engagement statements regarding the sense of belonging and the affective experiences of enjoyment with the activity (A11 and A13) were statistically higher than the emotional engagement statements regarding participants' perception that other group members value musical practice and support participation in the group (A14 and A15). In general, based on the descriptive statistics, the mean value for the statement regarding participants' perception that other group members value musical practice (A14) was not significantly different from the other statements for amateur musicians, but the reports of music students and professional musicians may have contributed to lower the general mean value for this statement. Corroborating these observations, amateur musicians had a statistically higher mean value for the statement regarding participants' perception that other group members value musical practice (A14) compared to music students, as well as this was the only participant group that did not show a statistically significant difference between the behavioral and emotional dimensions of engagement. Considering the inferential and descriptive results, it is possible that music students and professional musicians continue to engage in the actions (behavioral engagement) and experience emotional and social aspects (emotional engagement), even if they do not perceive that other group members value musical practice and support participation in the group. In this case, some music students and professional musicians may not have a voluntary choice, leading to behavioral engagement in the form of carrying out actions due to possible extrinsic motivations (Ryan and Deci 2000; Ramey *et al.* 2015). However, this situation contrasts with the experiences of belongingness and enjoyment reported by the participants. Furthermore, this discussion could imply that individuals may experience individual flow within collective contexts (including the reports on emotional engagement), but not necessarily collective flow that emerges from a dynamic of sharing where the perception that other group members value musical practice and support participation in the group plays an important role (Walker 2010; Tay *et al.* 2021).

It is worth considering in the detailed reports of the participants that the emotional engagement statements related to the sense of belonging and the affective experiences of enjoyment with the activity (A11 and A13) showed higher mean values than other statements of cognitive and emotional engagement. Therefore, the literature suggests that it is necessary to consider engagement not only as a product but primarily as a dynamic process that involves a series of negotiations by individuals in a given context and task (Reschly and Christenson 2012; Wang *et al.* 2019). In this way, the sense of belonging and emotional experiences can be present and can contribute to enhancing a flow experience, even if some aspects are still consolidating or undergoing transformation for the individual or the group (such as participants' perception that other group members value musical practice and support participation in the group). Indeed, research on collective flow in music practices indicates that a sense of belonging and emotional experiences also emerges from the process of negotiation within the group (e.g., Hart and Di Blasi 2015; Tan *et al.* 2021), considering that making music in a group requires cooperative and collaborative aspects of musical practice that can influence individuals' motivations and emotions (Goodman 2002; Schiavio *et al.* 2019). Regarding the results of this research, group music activities can promote a sense of affiliation in which the feelings and understandings of an individual can also be felt and understood by others through processes of social negotiation (e.g., Mithen 2005; Levitin 2006; Elliott and Silverman 2015; Cross 2016; Juslin 2019; Savage *et al.* 2021).

Inferential statistics enable more precise conclusions to be drawn from between- and within-group comparisons. In this way, practical interventions can be considered based on these statistical differences, considering the results and discussion presented in this article. However, in addition to the statistical differences, it is necessary to consider that some statements had similar mean values for the three participant groups, contributing to the absence of a statistically significant difference in the mean values of engagement in the general comparisons for participant groups. An example of similar mean values among the participant groups is the statement related to the participant's perception of feeling absorbed in the action and the distortion of time (S10), one of the subjective experiences reported in the state of flow (Csikszentmihalyi 1990). Another case is the statement related to the sense of accomplishment and the aspect that it would be very hard for the participant to give up the musical activity (S12). In this second example, behavioral engagement could also be related to the participants' actions that can sustain their participation, as in the case of the behavioral engagement statement about the interest in participating in the musical activity for a long period of time (S3). Considering deep engagement in an activity or task that can characterize the experience of flow, Nakamura (2001) and Nakamura and Csikszentmihalyi (2003) propose an expanded perspective on what they refer to as vital engagement. This concept is understood as a way of relating to the world intensely and positively, characterized by a subjective sense of meaning, enjoyment, and flow. In this sense, the authors argue that it is difficult to sustain engagement without enjoyment, and it is difficult to commit over time to an activity that does not provide a broader sense of accomplishment and meaning to the individual.

5. Limitations, future research directions, and conclusion

This study has some limitations, such as using self-reported data and relying on participants' recollections of group music practices. Therefore, future studies could consider methods such as direct observations of group music practices, analyses of interaction between individuals, longitudinal studies, and/or other approaches (e.g., Fredricks and McColskey 2012; Sawyer 2017; Fredricks *et al*. 2019). The present study investigated the self-reported experiences of amateur musicians, music students, and professional musicians, but the participant sample could be expanded and further refined in future research. Additionally, future research can explore diverse musical contexts and repertoires, and/or ensembles of different ages, with varying durations of existence, and with different numbers of individuals. The results and discussions presented in this study focus on individual experiences in different collective music groups, highlighting the need for further exploration of components that explain collective flow in musical groups. It is important to note that an individual may experience flow within a group even without the presence of collective flow (Pels *et al*. 2018). Therefore, as this is the initial phase of an explanatory sequential mixed methods project (Creswell and Plano Clark 2017), the theme will be further explored in a study that aims to deepen the relationship between engagement and collective flow.

Finally, this research assisted in deepening the understanding of individuals' engagement in collective music practices by considering that deep engagement can lead to individual flow or collective flow experiences within an ensemble. Based on the results and discussions of this research, individuals in a collective music practice seem to require sharing actions, reflections,

and collectively negotiated emotions that can contribute to sustaining motivations for engagement and flow in collaborative musical and learning processes.

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7. Acknowledgment

We would like to thank all the participants for their contributions to this research.