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ARTICLES

Approach to musical rhythm in Primary Education. Perceptions of Chilean specialist teachers

Abordaje del ritmo musical en Educación Primaria. Percepciones del profesorado especialista chileno

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Abstract

The rhythmic aspect is fundamental in the Music Education class at school. The aim of this article was to collect the opinions of Chilean music teachers regarding the approach to rhythmic elements -isochronic pulse, tempo, meter (metrical accent) and rhythmic phrases or patterns- in the third and fourth year of Primary Education. For this purpose, two focus groups were carried out. One group was made up of 6 initial teachers (3-4 years of service) and the other was made up of 5 advanced or expert teachers (more than 12 years of service). The results show that the most frequently used means are body movement and verbal language, which are worked mainly considering auditions related to the musical preferences and previous experiences of the students. For the future, it is important to strengthen the elements indicated for music teaching and to continue analyzing the praxis of music teachers in relation to the teaching of rhythm in the classroom.

Key words: Rhythm; Music Education; Music Teachers; Chile.

Resumen

El aspecto rítmico es fundamental dentro de la clase de Educación Musical en la escuela. El objetivo de este artículo ha sido recoger las opiniones del profesorado de música chileno, en relación con el abordaje de elementos rítmicos -pulso isócrono, tempo, metro (acento métrico) y frases o patrones rítmicos- en tercer y cuarto año de Educación Primaria. Para este propósito, se realizaron dos grupos focales. Uno de los grupos estuvo constituido por 6 docentes iniciales (3-4 años de servicio) y el otro, fue conformado por 5 docentes avanzados o expertos (más de 12 años de servicio). Los resultados muestran que los medios utilizados con mayor frecuencia son el movimiento corporal y el lenguaje verbal, los cuales se trabajan considerando principalmente audiciones relacionadas con las preferencias musicales y experiencias previas del alumnado. Hacia el futuro, resulta importante potenciar los elementos señalados para la enseñanza musical y continuar analizando la praxis del profesorado de música en relación con la enseñanza del ritmo en el aula.

Palabras claves: Ritmo; Educación Musical; Profesorado de Música; Chile.

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1. Introduction

There are multiple didactic strategies to deal with musical rhythm in primary education. Thus, the different approaches to music pedagogy seem to define their own techniques and methods to approach the teaching-learning of rhythm (Dalby, 2005). In this regard, previous work has highlighted the need to know the teacher's opinion regarding rhythm education (Öztürk, 2010), given that the quality and effectiveness in promoting rhythmic skills largely depends on the didactic decisions made by the music teacher (Modoran, 2014). Similarly, determining effective ways of working rhythmic information with students would strongly facilitate their rhythmic training (Durá, & Tejada, 2021).

Modoran (2014) has posited that it is important to constantly alternate theoretical and practical moments during rhythmic training, in addition to the use of body movement, verbal language, play and songs. In this sense, it is known that body movement is one of the most effective mechanisms for rhythmic training (Álamos-Gómez, & Tejada, 2020). For its part, verbal language has strong syntactic and psychological processing connections with rhythm (Jackendoff, 2009; Patel, 2008) and the use of songs, especially of student preference, would allow active-participative learning (Godoy, 2021), foster interest and enthusiasm (Vicente-Nicolás, & Mac Ruairc, 2014) and motivate learning by students (Springer, 2016).

All in all, the present work gathers the opinions of Chilean music teachers, in relation to the approach -within the compulsory music subject (90 minutes per week)- of rhythmic elements: isochronic pulse, tempo, meter (metric accent) and rhythmic phrases or patterns, in third and fourth year of Primary Education (students between 8 and 10 years of age). The results and discussion revolve around body movement and verbal language, which have been worked on by the participating teachers, mainly through auditions related to the musical preferences and previous experiences of the students.

1.1. Fundamental rhythmic elements for musical education

The pulse corresponds to a set of isochronous "beats" that often serves as a temporal reference during the perception of a musical fragment. This sequence of beats can be imaginary or represented by real sound events (Snyder, 2000). Humans seem to be prone to regularity and isochrony, which would be explained by biological structures, particularly related to the nervous system (Fujii, & Wan, 2014; Merchant *et al.*, 2015). Thus, some authors speculate regarding the existence of a cognitive bias towards musical isochrony (Fitch, 2017; Ravignani *et al.*, 2017). This bias would have its foundations in biological aspects (Bowling *et al.*, 2017) and/or in enculturation processes (Jacoby, & McDermott, 2017). All in all, the presence of an underlying regularity or pulse is an element of great importance for the processing of musical rhythm (Drake, 1998; Purwins *et al.*, 2008).

The study of tempo or "pulse rate" should be considered to facilitate the processing of rhythmic structures since there would be more "natural" and intuitive ranges that are more easily processed. The preferred pulse or optimal tempo spectrum for all people ranges from 60 to 120 beats per minute. This range is independent of other personal factors such as age or musical

training (Drake, & Betrand, 2001). Specifically, previous findings show that the optimal pulse rate is around 100 beats per minute or 600 ms (Grahn, & Brett, 2007).

The meter corresponds to an accentuation that is regularly perceived every certain number of "beats". In this sense, it is on a higher hierarchical level than the pulse. The meter of measure, by its isochronous nature, would have an important impact on rhythmic processing, since it forms a predictive framework for the perception of the central or accented pulse, which in turn allows the organization of the rhythmic events that make up a given musical fragment (London, 2012; Snyder, 2000).

Enculturation processes promote the acquisition of expectations that evidence a search for metrical accents even in the face of hearing non-metrical sequences (Haumann *et al.*, 2018). Moreover, rhythmic reproduction is better for metrical than for non-metrical rhythms (Chen *et al.*, 2008) and for strongly metrical than for weakly metrical ones (Chen *et al.*, 2008; Grahn, & Rowe, 2009). All in all, some work indicates that metric discrimination is fundamental not only for rhythmic processing, but also for a correct psychological understanding of body movement and language (Haumann *et al.*, 2018; London, 2012; Patel, 2008).

In Western music, there is a predominance of organization in multiples of two and three (Patel, 2008) and the main time signature meters are grouped into two, three, and four beats; meanwhile, the most frequent meter appears to be 4/4 (Kotz *et al.*, 2018). A predisposition on the part of listeners toward binary rather than ternary meters has been suggested (Haumann *et al.*, 2018) and the existence of enhanced processing for hierarchical binary relations compared to ternary or more complex ones. Thus, the discrimination and reproduction of rhythms in a meter with binary subdivision of the pulse would be superior to for rhythms in a meter with ternary subdivision (Drake, & Betrand, 2001; Gerry *et al.*, 2010; Gordon, 2012).

Regularity has been pointed out as a key element for the processing of rhythmic patterns, both of their internal structure and of the pulse on which the pattern is constituted (Drake, & Bertrand, 2001). Regularity is related to the possibility of predicting and anticipating the structure and position in time of rhythmic patterns. This aspect favors rhythmic processing and has been extensively studied in theories related to prediction and expectations (Friston, 2005; Large, & Jones, 1999; Vuust, & Witeck, 2014). Time intervals are often subdivided into equal ratios or 2:1 ratio, with rhythms containing 2:1 ratio being easier to reproduce and perceive in contrast to 3:1 ratio (Gordon, 2012; Repp *et al.*, 2011). In turn, rhythms with 2:1 or 3:1 ratio are better reproduced than rhythms with larger ratios such as 5:1, or complex non-integer ratios such as 1:2,5:3,5 (Sakai *et al.*, 1999). In addition, it has been suggested that listeners tend to distort interval durations in complex rhythmic contexts by simplifying and bringing rhythmic durations to the 2:1 ratio (Drake, & Betrand, 2001).

1.2. Resources and means for rhythmic music teaching

One of the most favorable means to conduct rhythmic training in primary school contexts is the use of corporal expression. This is pointed out, for example, by a recent work that evidences the relationships between motor action and cognition and that accounts for the contributions of neuroscience to rhythmic-musical education (Álamos-Gómez, & Tejada, 2020).

Some 20th century methodologies, such as Orff, Willems and Dalcroze, have given a leading role to body expression and movement for the achievement of musical skills, especially rhythmic ones. These practices are congruent with findings within the neurophysiologic domain that suggest that movement influences and is important for musical processing (Phillips-Silver, & Trainor, 2007). Specifically, motor activity could impact how isochronous pulse, meter, and rhythmic patterns are perceived (Chemin *et al.*, 2014; Levitin *et al.*, 2018; Phillips-Silver, & Trainor, 2007), enhancing skills related to rhythmic detection and synchronization (Levitin *et al.*, 2018; Stupacher, 2019), even in complex rhythmic contexts (Su, & Pöppel, 2012).

Thus, sensorimotor mechanisms play an important role in how musical rhythm is processed (Slater, & Tate, 2018). Specifically, research in the school context has suggested that some bodily activities (rocking, clapping, body gyrations, and percussion of simple rhythms), impact the ability to perceive and transcribe rhythmic patterns (Wang, 2008). A natural tendency to move in regular rhythmic contexts and with isochronous intervals has been proposed (Nozaradan, 2014; Nozaradan *et al.*, 2012). Some findings suggest that the pulse could be naturally coordinated with mediolateral movements of the arms (Toiviainen *et al.*, 2010), with the torso (Witek *et al.*, 2017) or with the hip and feet (Burger *et al.*, 2018). For its part, one of the bodily expressions synchronized with music that seems to influence the perception of meter the most is head movement (Burger *et al.*, 2018).

Musical rhythm and verbal language share common processing networks located in brain areas formerly related only to language, especially, Broca's Area (Fiveash, & Pammer, 2014). This cognitive link is mainly due to the fact that both rhythm and language are built from the combination of basic units (durations and syllables, for example) that give rise to hierarchically structured sequences (Jackendoff, 2009; Patel, 2009). In this sense, it has been said that both systems are syntactic (Patel, 2009) and that one of the most striking common features is the metrical structure (Jackendoff, & Lerdahl 2006). For its part, the clustering phenomenon is also applicable to musical and linguistic sequences, with evidence showing an overlap in brain processing for both domains (Patel, 2008). Specifically, this study shows that rhythmic expectation plays a preponderant role in musical and linguistic processing, reaffirming that shared processing between both domains has been fundamental not only for musical cognition, but also for other processes related to attention enhancement (Jung *et al.*, 2015).

Within music education, especially in the primary school context, the use of language as a tool to strengthen rhythmic competencies has a long history, particularly in the active and instrumental pedagogical methodologies of the 20th century. These educational practices are supported by the aforementioned cognitive links between the linguistic and musical domains and by recent scientific findings. Thus, several studies have reported a close link between rhythmic-temporal skills and reading skills in children (Flaugnacco *et al.*, 2014; Holliman *et al.*, 2010). For example, positive correlations have been found between phonological awareness and improved perception of musical elements, especially rhythmic ones (Posedel *et al.*, 2012). Likewise, some empirical work has suggested that the association between rhythmic and verbal patterns (e.g., use of syllables) is an optimal mechanism to facilitate rhythmic learning (Alamos, & Perez, 2015; Orts *et al.*, 2014).

1.3. Musical preferences and previous experiences of students

The study of musical preferences has aroused great interest in recent years (Pérez-Moreno, & Reverté, 2019), especially research on student preferences within the field of Music Education (Godoy, 2021; Pérez-Moreno, & Reverté, 2019; Yim *et al.*, 2014). This trend is due, in part, to the importance that the way in which music education teachers address the musical preferences of their students in the classroom would have (Herrera *et al.*, 2010; Vicente-Nicolás, & Mac Ruailc, 2014). It has been suggested that the use of student preferences would improve the planning of musical activities at school (de Vries, 2010; Tomlinson, 2013). Such preferences would promote active-participatory learning (Godoy, 2021) and foster interest and enthusiasm (Vicente-Nicolás, & Mac Ruailc, 2014). Similarly, previous studies indicate that students would dedicate more time to the development of activities that they enjoy (Teo, 2003). However, it is important for teachers to know the "musical life" of their students outside the school context, in order to develop the potential that students bring with them (Matthews *et al.*, 2016) and motivate learning (Springer, 2016).

Students' musical preferences seem to be related, to a greater extent, to popular music aimed at the mass market (Faure-Carvallo *et al.*, 2022). This music is mainly hosted by media that transmit through screens such as television, cell phones and video games (Arriaga-Sanz *et al.*, 2017). All in all, the preferred songs seem to be trendy and include clear, predictable themes and simple harmonic progressions (Levitin, 2006). Moreover, it is often music that is heavily manipulated by audio production technologies (Faure-Carvallo *et al.*, 2022). It is important to consider this last point, given that this technology-related characteristic could lead to homogenization in the popular music genres preferred by the student body (Faure *et al.*, 2020).

The cultural environment in which students develop strongly influences and modifies their musical needs or preferences (Almeida, 2016; Godoy, 2021). Thus, the family and school context have an important impact on the construction of their musical knowledge (Barret, 2013) and taste for specific musical repertoires (Tafuri, 2006). In particular, the school classroom can influence or modify the perception that students have towards particular musical activities and towards the music used in those activities (Droe 2006; Vicente-Nicolás, & Mac Ruailc, 2014).

2. Method

The approach of this research is mixed (qualitative-quantitative) and exploratory in nature.

2.1. Participants

This study involved the participation of music education teachers working in Chilean territory. The participating teachers were informed about: the objectives of the project, the anonymous nature of their participation, the law on personal data protection in Chile (*Law 19.628*) (Government of Chile, 1999), the voluntary acceptance to participate in the study and the option to withdraw from the study at any time without negative consequences. Finally, contact details of the personnel responsible for the research were provided for any questions or concerns. In

addition, they were informed that they could contact the principal investigator by e-mail to obtain the results of the study once the research was completed.

2.2. Instrument and procedure

For the present study, two focus groups were organized to obtain in-depth qualitative data from a limited sample of active music teachers, in relation to the facilitating means of rhythmic learning in the third and fourth years of elementary school and the specific ways of approaching rhythmic-musical technical contents. The categories or topics addressed were four: 1) isochronic pulse, 2) tempo, 3) meter (metric accent) and 4) rhythmic phrases or patterns.

The discussion groups were conducted in online mode (Cisco Webex Meetings), with an approximate duration of 90 minutes each. A total of 11 teachers participated, divided into two groups: the first group consisted of 2 male and 3 female teachers with more than 12 years of teaching service; the second group consisted of 3 male and 3 female teachers with 4 to 5 years of work experience. Both sessions were videotaped and subsequently analyzed with the qualitative analysis software ATLAS.ti.

3. Results and discussion

3.1. Pulse

The emerging codes most frequently linked to the pulse were those in which the participating teachers related this element to students' previous experiences, use of auditions and body movement. In the first case, the participating teachers stated that the students' previous experiences should be considered, since when thinking of their favorite song or starting from songs that the students have already experienced, it is easier to "put a name or theorize something they already know" (Participant 7). This also coincides with the high frequency obtained by the emerging codes "previous experiences" and "student feeling" within the analysis results (Table 1). All in all, the participating teachers' responses are in line with previous findings that indicate that using student musical preferences would improve the planning of musical activities (de Vries, 2010; Griffin, 2009; Tomlinson, 2013) and promote active-participatory learning (Godoy, 2021), fostering student interest and enthusiasm (Vicente-Nicolás, & Mac Ruailc, 2014).

Secondly, the participating teachers stated the use of musical recordings of different styles provided, mainly, by the students and songs performed by the teachers, either live or recorded. These results lead to think that teachers are interested in the "musical life" of their students (Matthews *et al.*, 2016) and, therefore, motivate their students' learning (Springer, 2016).

Table 1. Frequencies from the analysis of the focus groups

EMERGING CODE	FREQUENCY
Previous experiences (students)	23
Use of auditions as a teaching strategy	22
Students' feelings	19
Game	18
Movement	17
Teacher's feeling	12
Verbal Language	11
Musical instruments	10
Avoiding sheet music and theoretical explanations	7
Musical repertoire	6
Use of imitation/echo as a teaching strategy	6

Regarding pulse and movement, the teachers indicated that they make the students walk, march and dance to different types of music. They also invite them to move around using spaces outside the classroom, such as the schoolyard, and to percuss this element with different parts of the body. These results are consistent with the close relationship between rhythm and movement as motor activity would have an impact on the perception of the isochronous pulse (Chemin *et al.*, 2014; Levitin *et al.*, 2018; Phillips-Silver, & Trainor, 2007), enhancing skills linked to rhythmic synchronization (Levitin *et al.*, 2018; Stupacher, 2019). Moreover, they coincide with the natural tendency to move in isochronous contexts (Nozaradan, 2014; Nozaradan *et al.*, 2012).

For example, one participant points out "when you usually listen to music, you tap your foot, right? unconsciously, independently, on the bus...and I always start looking for memories about whether they have done that" (Participant 10). Finally, one of the concrete strategies that was repeated among the teachers to theorize about the pulse was to associate this element with the heart. In addition to showing the pulse as the "heart of music," some teachers often relate the heart pulse (at different times of the day, at rest, in activity, etc.) with the musical pulse and its speed.

3.2. Tempo

The participating teachers indicated that what they use the most are: auditions, corporal expression, the students' previous experiences and slow instrumental practice at the beginning. These means coincide with those used for the pulse. In relation to the auditions -second highest frequency (Table 1)-, they indicated that they sing accompanied by the guitar and speed up and/or slow down the pulse. They do the same with a recorded piece of music, to which they modify the tempo using different software. Also, they use recordings of musical works from different repertoires, which in terms of tempi, are contrasting with each other. Regarding corporal expression, the teachers stated that, as with the pulse, they promote the use of body percussion and recorded music to move and walk at different tempi. Students walk and/or march by adjusting their movement to different speeds through active listening to recordings, move in wide spaces (e.g., making circles or rounds inside the room or in outdoor spaces of the school) and "mark" the

pulse at different tempi ranges in a bodily manner, mainly with the foot. In the latter case, one of the teachers leads his students to remember how they automatically move their feet when listening to music on the bus. Another participant invites the course group to move to the beat of Back in Black and observes that foot and head movements predominate. All of these would favor the rhythmic formation of the student body, given that sensorimotor mechanisms play an important role in how musical rhythm is processed (Slater, & Tate, 2018). In addition, bodily expression enhances the timing and detection of rhythm (Levitin *et al.*, 2018; Stupacher, 2019).

Other elements highlighted by the participating faculty were previous experiences and the need for slow instrumental practice in the initial sessions. In relation to the former, some teachers stated that they asked to reinforce at home the recognition of different tempi, through music of the students' preference and/or children's music. Others attach importance to the students' musical background in order to theorize about the concepts of pulse and tempo. These practices aim to integrate the music that students bring with them from outside the school context, developing their musical potential in the classroom (Matthews *et al.*, 2016).

Another percentage of participating teachers use texts to exemplify and/or conceptualize tempo. They do this by reading faster or slower and emphasizing the expressive and interpretative importance of speed and constant pulse, both in verbal language and in music. These results account for the link that teachers establish between rhythm and language, both syntactic systems (Patel, 2009) constituted by hierarchically structured sequences (Jackendoff, 2009).

3.3. Meter

In relation to meter, the participating teachers stated that they approach them mainly by using auditions or musical recordings (Table 1). For example, while listening, they have the students express themselves through movement and mark the accents with different parts of the body. Teachers prepare auditions with binary and ternary metrics so that students can identify accents aurally and, in some cases, to give a theoretical explanation. Body language could have an impact on how meter is perceived (Chemin *et al.*, 2014; Levitin *et al.*, 2018; Phillips-Silver, & Trainor, 2007), in this sense, the pedagogical decisions of the participating faculty would be well targeted. In turn, the alternation of theoretical and practical moments during rhythmic training is consistent with Modoran's (2014) approaches. All in all, the tendency for teachers to use meters is congruent with the search for metrical accents (Haumann *et al.*, 2018). This practice would be highly favorable, given that rhythmic reproduction is better for metrical than for non-metrical rhythms (Chen *et al.*, 2008) and for strongly metrical than for weakly metrical ones (Chen *et al.*, 2008; Grahn, & Rowe, 2009). Furthermore, metric discrimination is known to be fundamental to both rhythm processing and psychological understanding of body movement and language (Haumann *et al.*, 2018; London, 2012, Patel, 2008).

In the case of metrical accents, a certain sector of the teaching staff encourages preset movements to mark them, e.g., students crouch or clap on "strong" beats and stand still or walk normally on "weak" beats. The participating teachers observe that in 4/4 contexts, especially rock, students naturally move their heads forward, while with music of ternary meter (3/4) or ternary subdivision (6/8) the movement is "from one side to the other". Although in the latter case, there are specific teaching indications that induce this movement.

They also make use of the composition of texts, poems and rhymes to work on the importance of stress, for example, stressing different syllables within a word or different words within a sentence. The latter is associated by a percentage of the teaching staff with the rhythm of vocal lines and song lyrics. All these practices are congruent with the cognitive link between rhythm and language. Both elements share common processing networks located mainly in Broca's Area (Fiveash, & Pammer, 2014) and are constructed based on the combination of basic units that give rise to hierarchically structured sequences (Jackendoff, 2009; Patel, 2009) and syntactic systems (Patel, 2009) structured from a metric (Jackendoff, & Lerdahl 2006).

Another resource used is to link the metric with mathematics. This is done by graphing each metrical relationship, teaching meter as a fraction and creating measures, establishing mathematical relationships from the duration of the figures. The latter is also reinforced by counting during the audition of different musical pieces: 1,2 for 2/4; 1,2,3 for 3/4 and 1,2,3,4 for 4/4.

One of the topics that had a high frequency was the theoretical difficulty of approaching the meter in the third and fourth year levels of Basic Education. The teachers stated that it is complex to make students of those courses understand theoretically the concept of meter, its origin, differences, etc. This is because they consider that it is a very abstract concept that is inadequate for the developmental stage of students at those ages. One teacher put it this way:

> The concept of meter, as such an abstract concept, is very difficult to bring it to a concrete level, especially in the youngest children. Let's remember that, at this age, up to 10 years old, it is very difficult to explain something abstract to a child, due to the issue of cognitive development [...] (Participant 9).

However, the participating teachers also referred to didactic strategies used to overcome the difficulty. These are mainly based on the use of analogies: for example, some teachers talked about "order" or how many objects fit in a small box or how many people fit in an armchair. All these elements were related to specific spaces where specific rhythmic figures and their equivalent durations had to "fit". All in all, these practices are congruent with the approach of Modoran (2014), who emphasizes the importance of constantly alternating theoretical and practical moments within rhythmic education.

In relation to the use of specific meters in the music class of third and fourth year of Basic Education, the teaching staff prioritizes "simple and identifiable" meter measures (participants 1, 4, 5 and 11), avoiding irregular meters such as 5/4 or 7/4, which are worked on in higher levels. The participating teachers were reiterative in pointing out that they select songs that are "square, structured and without many changes" (participant 4), to facilitate perception-comprehension and so that "there are no surprises in the middle of the song" (participant 3). Specifically, most of the teachers agree on the use of 2/4, 3/4 and, especially, 4/4. The predominant use of the latter meter is evidenced by some explicit comments: "4/4 is the most orderly form" (participant 2); "songs and patterns in 4/4 are easier to internalize". On the other hand, there is a scarce preference for eighths and especially for 6/8, which is discarded at the third and fourth year levels of Basic Education by several of the participants: "I do not work at those levels with metric figures in octaves for example" (Participant 4); "Generally, at those levels I work a lot with what are 2/4, 3/4, 4/4, I still do not dare much beyond that in fourth basic, only later would they see what is 6/8" (Participant 7).

These results can be supported by the predominance of the organization in multiples of two and three in Western music (Patel, 2008). In this context, the main meters are grouped into two, three, and four beats; meanwhile, the most frequent meter seems to be 4/4 (Kotz *et al.*, 2018). The practices stated by the participating teachers in this study would be optimal, given that they coincide with the predisposition towards binary meters over ternary ones (Haumann *et al.*, 2018) and the existence of enhanced processing for hierarchical binary relations compared to ternary or more complex ones. In this sense, the discrimination and reproduction of rhythms in a meter with binary subdivision of the pulse would be superior to for rhythms in a meter with ternary subdivision (Bergeson, & Trehub, 2006; Drake, & Betrand, 2001; Gerry *et al.*, 2010; Gordon, 2012).

An element closely related to meter is the accent. The teachers involved attach special importance to this rhythmic aspect because they associate it with the pulse. Moreover, for some of the teachers involved, it is important that the students understand the difference between them. To work on the accent in the classroom, the means or strategies that obtained the highest frequency were the use of body movement and verbal language. Regarding corporeal expression, the teachers indicated that the students follow the accents by percussing with some part of the body and even create together pre-established body movements to "mark" each of the rhythmic aspects, especially the metric accent. In addition, several of the participants use dance and the interdisciplinary possibilities offered by the work with the subject of Physical Education, since they have seen cases in which the practice of a dance facilitated the subsequent theoretical understanding of the accent phenomenon by the students. These practices converge with findings that indicate that body expression influences meter perception (Chemin *et al.*, 2014; Levitin *et al.*, 2018; Phillips-Silver, & Trainor, 2007), especially head movement (Burger *et al.*, 2018).

In relation to verbal language, teachers referred to the use of poems, rhymes, and songs with text, just as they did to work on meter. Also, some teachers expressed the importance of interdisciplinary work with the subject of language, for example, through the composition of poetic texts. These results are consistent with evidence showing an overlap in brain processing for musical and linguistic sequences (Patel, 2008). Thus, rhythmic expectation would play a preponderant role in musical and linguistic perception, reaffirming that processing between both domains has been fundamental (Jung *et al.*, 2015).

3.4. Rhythmic patterns and figures

In relation to rhythmic patterns and their approach in the classroom, the most frequently emerging codes were the use of recorded musical bases (auditions) and the consideration of the students' musical preferences and previous experiences (Table 1). Within the repertoires selected by the teachers, there is a diversity of styles, mainly belonging to popular and/or folk music: pop, rock, salsa, cueca, rin, among others, and, to a lesser extent, classical music. Specific examples mentioned were: *We will rock you* (Queen), *Billie Jean* (Michael Jackson), *Rin del Angelito* (Violeta Parra) and Beethoven's *Fifth Symphony*. However, beyond this repertoire proposed by the teachers, the people involved in the study gave great importance to the music preferred by the students, since they assumed that this music connects with the students' emotions and, therefore, favors learning. The latter is consistent with previous findings (Godoy, 2021; Vicente-Nicolás, & Mac Ruailc, 2014).

Many rhythmic patterns came from music that the students had listened to before, for example, video game music (Dragon Ball Z) or trap/reggaetón (Bad Bunny). In relation to the latter, one teacher stated:

> [...] although very much to my regret, we must include this topic of trap and reggaeton because it is something that children also listen to. And even if it is not our repertoire preference, one must include it, unfortunately, but it is valid" (Participant 9).

This testimony is congruent with the dichotomy that would be generated between the motivational factor and the promotion of learning offered (for students) by popular music aimed at the mass market and the sound homogenization present in the genres preferred by students as a result of technological manipulation (Faure *et al.*, 2020). All in all, it is important to consider that the school context influences musical perception (Droe 2006; Vicente-Nicolás, & Mac Ruailc, 2014). In this sense, listening to certain styles in the music classroom should be guided and always accompanied.

The figures most frequently used by the teachers, in the context of rhythmic pattern construction in the third- and fourth-year levels of Basic Education, were in order of frequency: eighth notes, quarter notes, half notes, sixteenth notes (in groups of four), crotchet rest and semibreve. The testimony of one of the participants, who assumed that he does not work on the semibreve with his students at these levels because, according to his opinion, he does not work on the semibreve with his students at these levels:

> "...we have to be honest, as musicians, we rarely play round notes. In the end you always see more crotchets, eighth notes grouped in pairs, right? and especially in the same repertoires that you see, it is going to be a little more complicated to find round ones, white ones, right? So, I take the round as passed in fourth grade and I think that the children, so far, have understood it very well" (Participant 10).

In sum, the selection of eighth notes and quarter notes as the first majority speaks to an inclination toward the 2:1 ratio (Drake, & Betrand, 2001). This tendency could be favorable for rhythmic learning, given previous findings that it is easier to reproduce and perceive rhythms containing 2:1 ratio in contrast to 3:1 ratio (Gordon, 2012; Repp *et al.*, 2011). Even listeners would tend to simplify rhythmic durations to the 2:1 ratio in complex rhythmic contexts (Drake, & Betrand, 2001).

Finally, the results showed that the rhythmic patterns addressed at these levels are mostly in 4/4, which coincides with the predominance of this meter in the West (Kotz *et al.*, 2018) and with the predisposition towards binary over ternary meters (*Haumann et al.*, 2018). A good example of this are the sayings of one of the participants, who extracts the basic rhythmic pattern from one of the most popular songs of the group Queen, we will rock you:

> "...repetitions of crotchet, two eighth notes, which is like the basic example of the Queen song, for example, which we all use at some point to do some activity, that is the classic of classics, it never fails. So, that kind of ostinato...or simpler rhythmic patterns, are easier to internalize" (Participant 5).

In terms of rhythmic patterns and phrases, the teachers stated that they frequently use body percussion. A certain percentage of the teachers involved use coarse movements and movements with displacement (mainly dancing and jumping in a playful way); but most of them encourage percussion in the post with clapping or with other parts of the body and in association with rhythmic syllables. Percussion with palms is frequently linked to the syllables of the Kodály method ("ta" and "ti-ti") or to other words such as "voy" and "co-rro". Other parts of the body linked to percussion are the mouth, clicks and blows in different body areas. All in all, the

tendency to motor activity would favor the perception of rhythmic patterns (Chemin *et al.*, 2014; Levitin *et al.*, 2018; Phillips-Silver, & Trainor, 2007), as sensorimotor mechanisms play an important role in the processing of musical rhythm (Slater, & Tate, 2018). Specifically, one participant notes:

> "The other part of the rhythm that I liked a lot, and they had a great time (laughs) was that we dissociated a lot between making clicks, sounds with the mouth, adding beats on the legs and feet at the moment of doing different rhythms. That is, the whites on the feet or on the legs, the eighth notes with the hands... and that helped the children's concentration a lot" (Participant 2).

Patterns or phrases are the rhythmic aspect most associated with verbal language. Most of the participating faculty stated or agreed to "play" with the rhythm of words. Several regularly associate sentences with rhythmic phrases, words with rhythmic cells or motifs, and/or syllables with rhythmic figures. They do this, for example, by using the very names of their students and/or words-sentences meaningful to them. With this "thematic material", the students create "sentences" and generate "rhythmic conversations" with their peers. One of the participants said: "Indeed, it is super good to incorporate words to your rhythms, I also did it and I feel that one of the things I really liked, and the children also liked was to play creating conversations only with percussion" (Participant 2). These teaching strategies, articulated around the grouping phenomenon, would be applicable to both musical and linguistic sequences, as most evidence shows an overlap in brain processing for both domains (Patel, 2008).

Regarding specific syllables, most of them use those proposed by the Kodály method ("ti-ti" and "ta"). Two of the teachers even declared having taken a course in this method. Also, "co-rro", "voy" and the elongation of certain words such as "laaaarga" or "gooool" are used, which represent the round or the white depending on the number of vowels added. These practices are somehow supported by empirical works that have suggested that the association between rhythmic and verbal patterns is an optimal mechanism to facilitate rhythmic learning (Álamos, & Pérez, 2015; Orts *et al.*, 2014). Likewise, they are congruent with studies that found a strong relationship between rhythmic-temporal skills and reading skills in infants (Flaugnacco *et al.*, 2014; Holliman *et al.*, 2010).

Finally, an interesting testimony showed the need to articulate and triangulate students' previous experiences, meaningful words for them and body movement:

> "So, I try to make a triangle, between the word, his experience as a person, what that word means to him, and a body movement that allows him to assimilate either an arm movement with a leg stroke, clapping stroke... I think it has been a very good experience in this sense" (Participant 1).

4. Conclusions

The purpose of this study was to gather the opinions of Chilean music teachers in relation to the approach to rhythm in the third and fourth years of primary education. From the results, it can be concluded that the most frequently used means are body movement and verbal language. In addition, the teachers give relevance to the musical preferences and previous experiences of the students as a didactic resource.

The teachers frequently use body movement for the rhythmic training of the students, specifically, to work on relevant elements of the temporal aspect. Several of the participants agree that body expression is of vital importance for the teaching of musical rhythm, especially in this

age range in which children need to be in constant movement, whether walking, jumping, or running. Thus, teachers promote body percussion, exaggerated body movement and dancing at these levels. Also, some opinions point out that movement, in combination with play, are key to favor rhythmic learning.

Another frequently used medium for rhythmic training in the third and fourth years of elementary school is verbal language. Rhythmic patterns and associated figures (durations) were the elements most frequently linked to the mother tongue. The teachers indicated that they use the rhythm-language binomial through multiple strategies. Thus, they often use verbal phrases and words, particularly the syllables "ti-ti" and "ta" included in the Kodály method. In addition, there is an important tendency to link verbal language with bodily expression. On the one hand, bodily movement with displacement is used to enhance the learning of isochronous pulse, tempo, meter and accent. On the other hand, verbal language is used to facilitate the understanding of rhythmic figures, phrases, and patterns, that is, to develop the phenomenon of grouping.

The musical preferences and previous experiences of the students, through recorded musical bases (auditions), are highly considered for rhythmic training. Beyond the repertoire selected by the teachers (mainly belonging to popular and/or folk music), popular music of mass dissemination is used, since it is assumed that these musical styles connect with the students' emotions, which would result in improved learning on the part of the students.

Future work should continue to analyze teaching practices related to the teaching of musical rhythm. It is important that this exploratory work could be replicated in a larger sample of practicing teachers, considering other elements such as, for example, the school context, the students' cultural background, among others. However, it seems to be highly advisable to continue using body movement, verbal language, and the musical experiences/preferences of the students to enhance rhythmic and musical training in the elementary classroom.

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