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# **Conceptions of woodwind students regarding the process of learning a piece of music<sup>1</sup>**

Cristina Marín, María-Puy Pérez-Echeverría and Nora Scheuer

## **Abstract**

The way in which students and teachers conceive the nature of knowledge and its acquisition have been deeply investigated in recent decades, since these conceptions underlie teaching and learning processes themselves. In this study we analysed how woodwind students from different levels of expertise conceive the process of learning a musical piece. As in previous studies about learning processes in music, we divide it into three stages: the beginning (first sessions of study of the new piece), the middle of the process (the student continues practising) and the end (the sessions before the performance). Sixty-eight Spanish woodwind students from three different levels of instruction completed an open-ended questionnaire. A statistical analysis of textual data was applied to the responses, in order to identify lexical differences among groups of participants about their learning conceptions. Statistically significant lexical differences were found for the variable 'Level', and three lexical groups were identified for each stage of learning, corresponding to the three levels. Elementary students held a conception of learning in which there is a linear relationship between conditions (amount of practice time, repetition) and outcomes (mainly related to notational elements), giving a small presence to the learner's agency. Intermediate students began to consider the internal structure of the piece and its expressive function, and they particularly emphasized mental processes involved in learning. Advanced students suggested activities requiring a greater degree of autonomy and reflection, considering the piece as an element for the performer's expression. Changes in goals and activities mentioned for the different stages of learning were also identified for each level. Results suggest that as level of instruction progress, it becomes more probable to find more sophisticated conceptions, which is consistent with previous research in several knowledge domains. Implications for education are discussed.

**Keywords:** conceptions; musical learning; musical expertise; music students; learning strategies.

## **Introduction**

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The process of learning new pieces of music by students at different levels has been the object of much research in recent decades (Chaffin and Imreh 2001; Chaffin et al. 2003; Gruson 1988; Hallam 1997; McPherson 2005; Nielsen 1999). This paper also explores that process, but from an internalist or first person perspective (Olson and Bruner 1996), using the analysis of such process as a means to understand students' mental representations of learning music. In the fields of education and psychology, these representations are known as conceptions of learning and given their educational and psychological significance, have been the object of research in various domains of knowledge (Hofer and Pintrich 1997, 2002; Marton and Säljö, 1984; Pozo et al. 2006; Säljö, 1979; Scheuer, de la Cruz, and Iparraguirre 2010; Scheuer, de la Cruz, and Pozo 2002; Scheuer et al. 2009; Scheuer et al. 2006). These conceptions influence the goals and strategies that students use for learning, which in turn affect the learning outcomes (Marton and Säljö, 1976a, 1976b; Pozo et al. 2006; Säljö 1981; Schommer 1990, 1993). In the field of music, students' conceptions have been studied from various theoretical standpoints, as we shall see below (Bautista et al. 2009, 2012; Cantwell and Millard 1994; Hallam 1995a; Nielsen 2012; Reid 2001; StGeorge, Holbrook, and Cantwell 2012).

The aim of this study was to analyze the goals and strategies suggested by students at different levels of musical training for learning new pieces, and to interpret this information in terms of conceptions of learning. In other words, we considered the students' statements as the object of the research itself, because they reveal students' approach to learning. Following Bruner (1990), the study of what people say that they or other people do, as well as how they say it, is an important key to understand the meanings they generate and use in their interactions with the world. Hence, achieving a better understanding of students' ideas about what to study and how to do it may contribute to a more comprehensive understanding of the process of learning itself.

#### Learning a musical piece at different levels of expertise: What and how to learn

Like in other learning domains (for a review, see Ericsson et al. 2006), Much research has analyzed how music students and professional musicians approach their learning of new pieces of music and the differences between both groups. Specifically, researchers have investigated how musicians approach their daily practice by focusing on the analysis of the activities and strategies suggested and performed (Chaffin et al. 2003; Hallam et al. 2012; Jørgensen and Hallam 2009; Nielsen 1999).

These activities and strategies vary according to the musician's level of skill (Gruson 1988; Hallam 1997) as well as to his/her ultimate goals and stage of progress in learning the piece (Chaffin et al. 2003; Williamon, Valentine, and Valentine 2002). In this paper, we broaden this view by taking into account the underlying conceptions of learning.

Several authors have broken down the process of learning new pieces in order to analyze it in a more detailed way (Chaffin et al. 2010; Nielsen 1999; Williamon and Valentine 2000). Although these studies break the process down into different numbers of segments, all of them agree in distinguishing an initial stage which includes the first moments of work on the piece, a final stage which precedes the public performance or exam, and intermediate stages. Some authors distinguish three stages of practice plus a stage of maintenance for the piece which can last months or years (see Lehmann, Sloboda, and Woody 2007). In this study we will consider three stages in studying a piece of music, so that we can achieve a better understanding of the conceptions along the process of learning. The stages are the following: first contact with the piece, evolution of study and days prior to public performance.

Research about musical learning reveal that professional musicians usually spend the first part of their study time on reading the entire piece in order to acquire an overview (Hallam, 1995b), returning to this type of reading during the final study stages (Chaffin et al. 2003). This overview, called by some the ‘big picture’ or ‘artistic image’ (Chaffin et al., 2003; Chaffin et al. 2010; Lehmann and Gruber 2006), enables the musician to gain musical understanding and detect technical and expressive difficulties which will subsequently require specific work (Hallam 2001; Chaffin et al. 2003; Lehmann and Gruber 2006). The results of these studies are consistent with those obtained in other domains of knowledge, where physicists and other experts spend initial problem-solving time on acquiring an overview in order to identify the type of problem and classify it for subsequent resolution (for a review, see Chi, Feltovich, and Glaser 1981, Ericsson et al. 2006).

During the intermediate stage, musicians with advanced levels of knowledge usually work on specific issues, which depend on the musical piece, the instrument and the musician (Hallam 1995b, 1997, 2001). They focus on the detailed study of the difficult segments detected in the first stage, beginning with relatively small segments, which are lengthened as the study progresses.

During the final stage, studying fragments is substituted by playing the whole piece, recovering the overall perspective of it (‘big picture’) and paying attention to matters of sound and interpretation (Chaffin et al. 2010; Miklaszewski 1989).

This approach to the musical piece differs from the learning strategies commonly used among students in the first levels of musical education (Gruson 1988; Hallam 1997; McPherson and Renwick 2001). Beginning students rarely identify or plan the study of difficult sections. They tend to play the entire piece instead of working on individual complicated parts, as well as immediately repeating a single note when they identify an error in playing it. This behaviour reflects a low level of metacognitive skills, which has been identified as a characteristic of beginners in several domains of knowledge (Chi 2006; Mateos 2001; Zimmerman 2006).

Beginners usually focus on notes and rhythm first, moving on to technical aspects later. Also intermediate students tend to privilege those elements, with very few of them taking dynamics and other expressive matters into account (Bautista et al. 2009; Marín, Pérez-Echeverría, and Hallam 2012). That is, initial and intermediate students focus firstly on notational elements, which, according to research in graphical and text comprehension, constitute the first level of understanding of a representational system (Friel, Curcio, and Bright 2001; Lowe 1993; Postigo and Pozo 2004; Kintsch and van Dijk 1978).

As musicians progress in their musical studies, they begin to identify difficult passages and work on them separately, in addition to paying attention to expressive and interpretative matters. As level of expertise progresses, so do metacognitive skills and understanding of the musical score (Gruson 1988; Hallam 2001; Hallam et al. 2012).

Whereas learning strategies in music have been thoroughly analyzed in the last decades, there are few studies that have taken into account the ideas, beliefs or conceptions that underlie the learning processes, as well as the presumed relationship among conceptions, strategies and levels of musical understanding (Bautista et al. 2009; Bautista et al. 2012; Hallam 1995a; López-Íñiguez, Pozo, and de Dios 2013; Marín, Scheuer, and Pérez-Echeverría 2012; Nielsen 2012; Reid 2001; StGeorge, Holbrook, and Cantwell 2012).

### Students' conceptions of learning

As mentioned above, conceptions of learning in different fields of knowledge have been studied for decades from various theoretical approaches (e.g. conceptions and approaches to learning, Entwistle 1985; Marton and Säljö 1976a, 1984; epistemological beliefs and theories, Hofer and Pintrich 1997, 2002; Schommer 1993; implicit theories, Pozo et al. 2006; Scheuer et al. 2009). The term 'conceptions of learning' is used to account for the mental representations of what learning is and how it is acquired (Marton and Säljö 1976a, 1984), which underpin and influence any learning process (Pramling 1996).

Some researchers have analyzed how people conceive and experience learning by analyzing what learning means for them and how they think learning takes place. This has been investigated mainly in the context of writing and reading tasks (Biggs, 1987; Entwistle 1985; Marton and Säljö 1976a, 1976b). Although with different names and taxonomies, two main approaches to learning have been described, deep and surface, which are not necessarily expertise-related, since advanced students and experts in some domains adopt either (Marton, Hounsell, and Entwistle 1984). These approaches appear to be related with the type of strategies that the learner carries out, and, furthermore, the outcome that is achieved.

A person adopting a deep approach when reading a text tends to obtain a general understanding of the author's intention and the meaning of the text and tries to generate a

personal view of that meaning. Instead, adopting a surface approach leads to focus on the text itself, on the sign, thus paying attention to factual information and disregarding inferences and personal opinions. Learning approach not only depends on the person, but also on the learning context, two dimensions which cannot be analyzed separately (Schmeck 1988). Thus, the type of learning task or the type of exam proposed by a teacher would influence the approach adopted.

Although there are few studies about learning approaches in the musical domain, results go in the same direction as those in other knowledge fields. Students adopting a surface approach preferred rote learning procedures and paid special attention to technical issues and notational elements. In contrast, learners adopting a deep approach looked for the global musical meaning of the piece, considering technical competence as necessary in order to achieve a better performance (Cantwell and Millard 1994; Hallam 1995a, 1995b; Sullivan and Cantwell 1999).

Another strand of research has studied the epistemological side of learning conceptions, that is, what people think about the nature of knowledge and how it is acquired. Perry (1970) established nine successive and increasingly sophisticated levels of intellectual development, extending from a dualistic point of view (knowledge as absolute, owned by the authority and unambiguous) to a relativistic one (knowledge as construction, related to the person and the context). Hallam (1995a), in a study where professional musicians spoke about their approach to learning, identified that almost all of them attained the highest epistemological levels identified by Perry. In contrast with Perry's developmental scheme, Schommer considers personal epistemologies in terms of a system of beliefs that is organized in several dimensions, which are more or less independent from each other. According to this position, a person can hold a sophisticated belief about a particular aspect of knowledge together with a simpler one in other aspects.

Epistemic beliefs are relevant in the field of education due to their relation with academic achievement. Less advanced epistemological beliefs are associated with lower performance in reading comprehension tasks, metacomprehension, ill-defined problem-solving, transfer of learning and conceptual change, whereas sophisticated beliefs are associated to higher levels of performance in the same tasks (Mason 2002; Pintrich 2002). The same pattern has been described in the musical domain, where more sophisticated epistemological beliefs appear to be related to the use of strategies for organization and self-regulation, as well as to a deeper level of understanding of music (Nielsen 2012; StGeorge et al. 2012).

Studies carried out within the framework of implicit theories (Wellman, 1990) have arrived to similar results. On the whole, it has been found that many preschoolers and children at early levels of Elementary Education conceive learning as a state which is reached in absolute terms, without any intermediate steps: either you know something or you don't know it.

Learning is regulated externally by other agents such as teacher or family (Scheuer et al. 2009). The same is true of the first levels of musical instruction (Marín, Scheuer, and Pérez-Echeverría 2012). Students believe that there is a single, fixed way to play each piece and consider direct transmission of information from the teacher as the best help for learning. Most initial music students in formal conservatories understand the musical piece as a sequence of symbols to be decoded and played on the instrument, showing a prevailing first-level comprehension of the musical score, as explained before.

As learners progress in their educational-developmental level, their conceptions become increasingly complex (Bautista et al. 2009, 2012; Scheuer et al. 2009; Schommer 1993). They begin to consider learning as a process with intermediate stages, so that at times knowledge may be attained only partially. Students also begin to consider the learner's agency in the learning process (internal agency), taking into account the intervention of self-regulating processes in learning. The acquisition of knowledge is no longer conceived of as the reproduction of a model, but as the selection, organization and integration of information from different sources (Pozo et al. 2006, Scheuer et al. 2006; Scheuer et al. 2009). This way of conceiving the learning process seems to be fairly usual in persons with school culture, while a conception even more sophisticated that considers learning as a process of construction and development of mental representations is only found among some advanced students or teachers (Olafson and Schraw 2006; Pozo et al. 2006).

In the field of music, like in other knowledge domains, the most sophisticated standpoints have been observed only occasionally in university students, who consider the score as a basis upon which to construct their own interpretation, giving prevalence to the expression of ideas and feelings through music. They prioritize the development of personal autonomy when learning new pieces, and consider that the teacher's role is to guide the learning process (Bautista et al. 2009; Marín, Scheuer, and Pérez-Echeverría 2012). However, not all advanced students or professional musicians hold this conception, and many seem to maintain the less complex views (Cantwell and Millard 1994; Nielsen 2012; Reid 2001; StGeorge et al. 2012).

Together, these results suggest that conceptions of learning depend to a large extent on the degree of learning or training in the specific area of knowledge, although this knowledge does not suffice to generate the more sophisticated conceptions, like those close to constructivism. Studies on conceptions of learning both in the field of music and other fields seem to indicate that changes in them occur as a result of participation in increasingly complex learning situations, whether formal or informal. Nevertheless, these studies suggest that there are limits to this progress. Achieving standpoints that approach constructive conceptions requires, among other socio-cognitive factors, specific spaces in which to reflect upon teaching and learning in which learners are involved (Martín and Cervi 2006; Schön 1987). The study of conceptions in the field of music instruction emerges as a particularly interesting issue, since the

teaching culture at the conservatoire has been generally considered to be traditional (Bautista and Pérez-Echeverría 2008; Kingsbury 1988; Jørgensen 2000; López-Íñiguez, Pozo, and de Dios 2013; Musumeci 2005).

### Aims

The studies we have reviewed so far studied either conceptions of and approaches to learning music, or the learning process itself, sometimes broken down into various study sessions. However, we have not found any research work making a detailed analysis of conceptions at different stages while learning a piece of music. Our main aim was in fact to analyze how music students conceive the learning process of a piece throughout the three stages mentioned above, from the first contact with the piece up to the days before its public performance. In line with Pramling (1996), we focus on the study of what and how learning takes place through:

- (a) The main outcomes to be achieved in the process and the difficulties that may be encountered (what), and
- (b) The means for achieving the outcomes and the solutions provided for resolving difficulties (how).

We are interested in studying whether students believe that these results, means, difficulties and solutions remain the same or vary throughout the different learning stages and, in the latter case, what this variation consists of. Moreover, considering the differences between professional and trainee musicians regarding their approaches to studying music and the different conceptions of learning held by musicians at different educational levels, we are interested in ascertaining whether and how their level of instruction influences these conceptions. With this aim, this study analyzes conceptions of students at three levels of musical instruction.

### **Method**

#### Participants

Sixty-eight students from 14 conservatories in Spain, specializing in a woodwind instrument usually present in the symphonic orchestra formation (flute, oboe, clarinet and bassoon), took part voluntarily in the study. They were in one of the levels we intended to study: 4<sup>th</sup> Elementary Degree (4<sup>th</sup> ED), 3<sup>rd</sup> Professional Degree (3<sup>rd</sup> PD) and 6<sup>th</sup> Professional Degree (6<sup>th</sup> PD). Since students of different ages may be at the same level of musical studies, we have reported their distribution in age ranges. Participant gender was almost evenly distributed within each level. Table 1 shows the distribution of the participants (i.e., students who volunteered) according to the academic level, age range and gender.



Musical studies in Spain are organized into three degrees (L.O.E. 2006): Elementary Degree (ED, four levels), Professional Degree (PD, six levels) and Tertiary Degree (TD, four levels). Music students usually start Elementary Degree at the age of eight or nine, attending lessons at the conservatory after school. Throughout the Elementary and Professional Degree courses, in addition to individual instrument lessons, students have other classes such as analysis, music history, chamber music, orchestra and fundamental principles of composition. The Tertiary Degree corresponds to a Bachelor of Music Degree. Students start this Degree after finishing high school, usually at the age of 18.

Table 1. Frequency distribution of participants according to academic level, age and gender.

LEVEL		4 <sup>th</sup> ED	3 <sup>rd</sup> PD	6 <sup>th</sup> PD	Total
<b>N</b>		25	22	21	68
<b>AGE RANGE</b> (years old)	<b>10-11</b>	13 (52%)	---	---	13 (19.1%)
	<b>12-13</b>	8 (32%)	1 (4.5%)	---	9 (13.2%)
	<b>14-15</b>	4 (16%)	9 (40.9%)	---	13 (19.1%)
	<b>16-17</b>	---	8 (36.4%)	5 (23.8%)	13 (19.1%)
	<b>18-19</b>	---	1 (4.5%)	7 (33.4%)	8 (11.8%)
	<b>≥20</b>	---	3 (13.6%)	9 (42.8%)	12 (17.6%)
<b>GENDER</b>	<b>Male</b>	11 (44%)	8 (36.4%)	12 (57.1%)	31 (45.6%)
	<b>Female</b>	14 (56%)	14 (63.6%)	9 (42.9%)	37 (54.4%)

### Materials and tasks

Participants responded individually in writing to an open-ended questionnaire. First, each student was asked to select a baroque or classical work that he/she knew well, and imagine that a classmate ('Juan') was preparing to learn it. The task consists of advising him on how to learn the piece, through a guide (the questionnaire) conceived as a set of questions for participants to respond to. The questionnaire divided the learning process into three stages: the day that 'Juan' would begin to study the piece; the intermediate days of study; and the final days before the concert. Participants were asked to write down the learning outcomes that they believed the imaginary classmate should achieve in each stage. Then they were asked to select, for each stage, what they considered most important to learn from among all their suggestions. This learning priority, along with the questions probing deeper into how and what, were the focus of the research study we present here. After selecting the learning priority, participants were asked to explain why they considered it the most important (Question 1). Then they were asked to describe the activities that would enable the imaginary classmate to achieve that learning (Question 2), difficulties he might encounter while attempting to learn it (Question 3) and lastly, the solutions that the participant would suggest (Question 4).

The questionnaire thus includes four groups of questions for each stage, as shown in Table 2. Questions 1 and 3 refer to what to learn, while questions 2 and 4 refer to how to learn.

Table 2. Questions and their aims for each study stage

QUESTION	AIM OF THE QUESTION
1. In my opinion, the most important learning in stage X is... Why is this learning important? Do you think it is important to learn it in this particular stage? Why?	<b>Outcomes:</b> selection of the most important learning in this stage, explanation of the selection and of the appropriateness of the learning for the stage.
2. How is this learning achieved? Explain what you think Juan should do to learn it.	<b>Means:</b> activities by which learning is achieved and artifacts used.
3. What difficulties might Juan encounter when learning this?	<b>Difficulties</b> that may be encountered while learning the piece proposed.
4. How could he solve them?	<b>Solutions</b> implemented to overcome difficulties.

### Procedure

The questionnaires were delivered to instrument teachers at the different conservatories, who in turn gave them to all the students in the target levels (4<sup>th</sup> ED, 3<sup>rd</sup> PD and 6<sup>th</sup> PD) which wanted to take part voluntarily in the study, and collected them when they had been completed. All minor students provided a signed parental consent in order to take part. Teachers returned all completed questionnaires to the researchers within three months.

### Analysis

We applied lexicometry (Bécue-Bertaut 1991; Lebart, Salem, and Bécue-Bertaut 2000) to the corpus generated by literal digital transcription of the handwritten answers provided by the 68 participants to questions 1, 2, 3 and 4 for each learning stage. The answers were transcribed according to ‘dictionary words’, based on the conventional grammar and orthography rules established by the Real Academia Española for Spanish language. Lexicometry was applied to this corpus with two purposes:

- (a) In order to establish whether there were statistically significant differences among the vocabulary used by the participants in their responses for each learning stage according to their educational level.
- (b) If differences were found according to educational level, to identify lexical groups associated to the level in order to describe the different ways in which the participants from those different educational levels would guide their imaginary

classmate's learning (according to the outcomes, means, difficulties and solutions they provided) in each stage.

The SPAD Recherche software (Système Portable d'Analyse des Données Textuelles, version 5.6) was used. An explanation of how the lexicometric method was applied is provided below.

#### Evaluation of lexical differences according to participant educational level

In order to distinguish whether participants answers showed statistically significant lexical variability according to educational level, Correspondence Analysis (Greenacre 1984) was applied to three lexical tables. A lexical table is a contingency table where rows correspond to all participants (hence we have 68 rows) and columns correspond to all the different words appearing more than a given number of times in the corpus (i.e., a frequency threshold is established for the part of the corpus corresponding to each set of questions). Each cell in the lexical table reports the frequency with which each of these words appears in the full response given by each participant. Correspondence Analysis (CA) was applied to each of the three lexical tables (one per stage), with frequency threshold = 3 and considering words and participants as active variables. Participants' educational level was included as an illustrative or complementary variable. In CA, active variables define dimensions (also called components, factorial axes or factors). Illustrative variables do not contribute to defining such dimensions, but allow the structure of the information provided by active variables to be illustrated (Crivisqui 1993). The null hypothesis—that there are no lexical differences between the modalities of each illustrative variable, in our case, the variable 'Level'—is rejected if they obtain a test value  $\pm 1.96$  ( $p < .05$ ) on one or more dimensions. Test value is a statistic that allows this null hypothesis to be tested and is equal to the distance—in terms of number of standard deviations—of each modality to the centre of gravity on dimension  $\alpha$  (Bécue-Bertaut 1991). This test value allows assessment of whether or not a given modality is statistically important to characterize a dimension. In the context of the SPAD software, test value is expressed in terms of a normal centered and reduced distribution. According to customary criteria (Crivisqui 1993), the number of dimensions we took into account to measure test value was that preceding an abrupt decrease in the percentage of inertia or variability explained by their eigenvalues. In the three CAs, that abrupt decrease occurred after the second dimension, so that two dimensions were retained in each CA.

#### Identification of lexical groups and description of different ways of guiding learning

Once the statistical importance of the variable 'Level' was found for each stage of learning, we grouped answers according to participant 'Level' and performed a new CA on each

aggregate lexical table (one per stage). On these tables, the columns are the three levels (4th ED, 3rd PD and 6th PD) and the rows are all the words remaining after applying the threshold. Each cell reports the frequency with which each word appears in the set of answers provided by the participants in a given level. The results of the CA are projected on factorial planes, whose dimensions provide information on the principal variabilities of the types of answer. The analysis of the planes allows the identification of lexical groups or associations between words and levels. In order to form the lexical groups, we considered those words and levels whose contribution to one or both factorial axes was higher than the average contribution.

The Automatic Selection of Modal Responses procedure (Modal Responses procedure for short) was subsequently applied in order to obtain the most typical responses provided by the participants at each level associated to the different lexical groups. Note that this procedure does not operate with the results provided by CA. The Modal Responses procedure arranges the original complete responses typical of the participants in each modality (e.g. all participants in 4th ED) in decreasing order, by calculating the  $\chi^2$  distance between the lexical profile of each participant and the lexical profile of the part of the corpus formed by the responses provided by all the participants in the corresponding modality (Lebart, Salem, and Bécue-Bertaut 2000). The first modal response (for, say, 4th ED) is the closest to the lexical profile of the responses provided by 4th ED students, and so on. As is customary in this kind of analysis, several modal responses were taken into account for the qualitative analysis of each level. Thus, modal responses are not artificial summaries of the responses given by a group, but real responses that have been automatically selected due to their representative character for a given modality of participants. The Modal Responses procedure allows words to be situated in their immediate context of production, thus remediating the fragmentary nature of any study restricted to isolated words.

## **Results**

### Lexical differences according to level in each study stage

In the two dimensions retained in each CA, we analyzed the test values obtained by each modality of 'Level', with the purpose of determining whether the vocabulary used by the 68 students in their answers to the three stages of learning varied according to it. In Table 3 we report the test values for the three stages.

Table 3 shows that the highest and lowest levels both show statistically significant differences for all stages, in one or both dimensions. Based on this result, we grouped individuals according to the level for the next step of analysis.

Table 3. Test values according to level modality on the selected dimensions of the CA for each stage.

		STAGE 1		STAGE 2		STAGE 3	
		Dimension 1	Dimension 2	Dimension 1	Dimension 2	Dimension 1	Dimension 2
Level	4 <sup>th</sup> ED	<b>5.44**</b>	-0.91	<b>-3.32**</b>	<b>5.56**</b>	<b>-5.47**</b>	-1.79
	3 <sup>rd</sup> PD	-0.34	1.67	0.92	-1.76	0.68	0.01
	6 <sup>th</sup> PD	<b>-4.46**</b>	-0.79	<b>2.05*</b>	<b>-3.24**</b>	<b>4.10**</b>	1.51

Test value: distance, in terms of number of standard deviations, from each modality of Level to the centre of gravity on the dimension  $\alpha$ .

\*  $p < .05$ , \*\*  $p < .001$ .

### Identification of lexical groups and description of different ways of guiding learning

Following are the results of the CAs performed on the aggregate lexical table ‘Words’ x ‘Level’ for each stage. We shall see that for the three stages, the results allow three main lexical groups to be identified, each of which is associated to a level. For each stage, we present the factorial plane, report the composition of the lexical groups and then enrich their description based on the analysis of the most typical responses for the associated level, according to the results of the Modal Responses Procedure. Lastly, Table 4 summarizes the behaviour of the three levels through the four questions for the three stages.

#### Stage 1

Based on the factorial plane of the CA performed on the aggregate lexical table according to ‘Level’, we identified three groups of associations among levels and words having above average contribution to one or both dimensions (Figure 1).

The groups were the following:

Group 1. Located in the lower left quadrant, formed mainly by the words accidentals, key signature, flats, song, as, time signature, slow [in Spanish, ‘*despacio*’], that (adjective masc.), how, that (pronoun), *doing it*, ‘*lo*’ (him/it - accusative sing. of m. and neut. pers. pron), badly, many, much, very, no, or, other, score, because, you can, beat, what, rhythm, to know, you know, will come out, come out, would know, to sol-fa it, *sharps*, *only*, ‘*te*’ (you - personal pronoun object case), would have, playing, to play, to play it, tonalities, to work on it, bit [piece or fragment] and associated to level 4<sup>th</sup> ED. The words more, measure, to sol-fa, rising, well, that (adverb), *metronome*, ‘*le*’ (as indirect object – him, to him, her, to her, it, to it, you, to you), if, are shared by Groups 1 and 2. The words *could*, ‘*sus*’ (possessive adjective plural of ‘su’ – his, her, their, your), still, zones, tuner, tuning, are shared by groups 3 and 1.

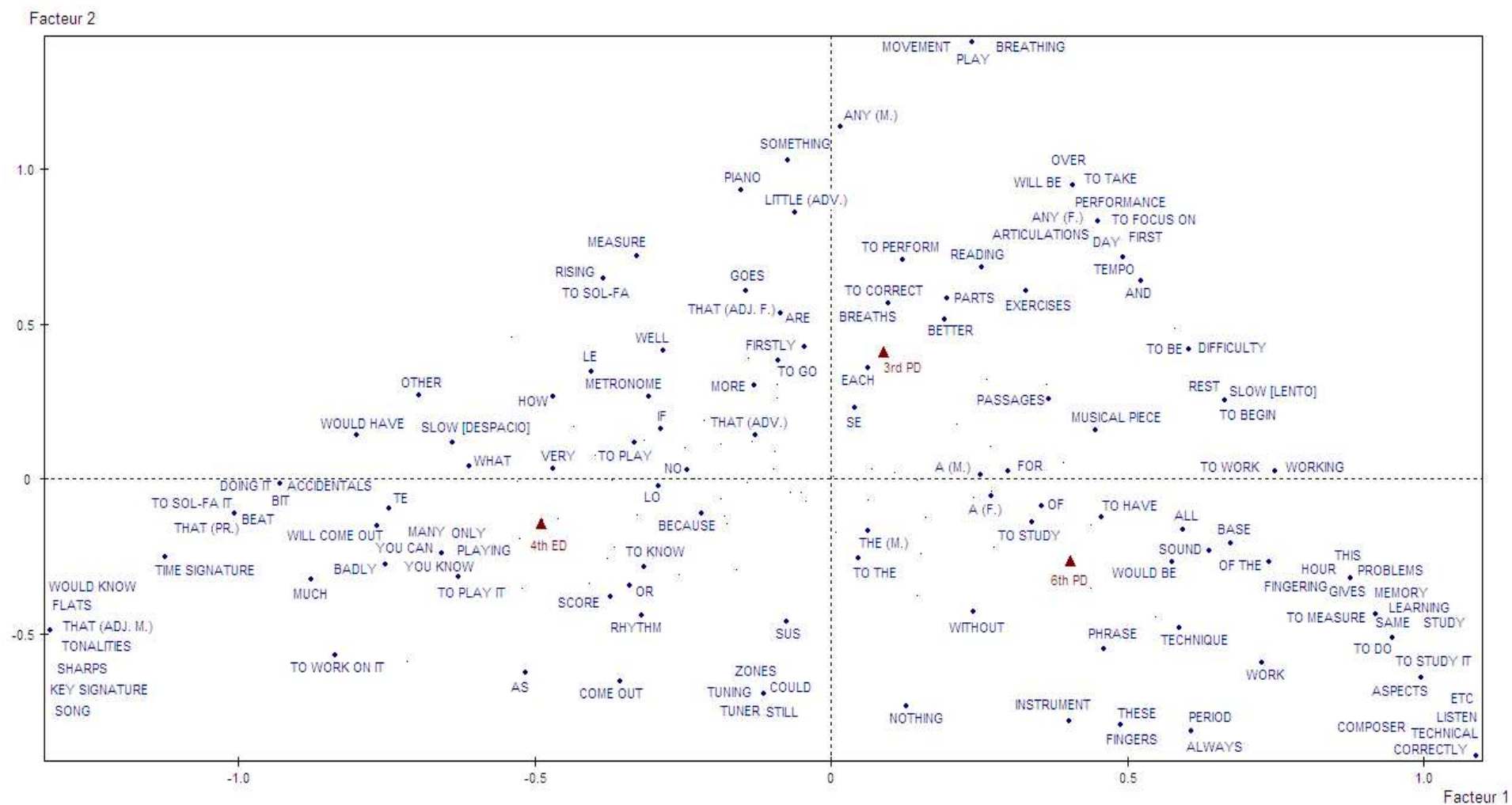


Figure 1. CA on stage 1 aggregate lexical table. Projection of words with above average contribution and modalities of the variable 'Level'.

The words that form this group in this first study stage refer mainly to notational features of the score (flats, sharps, rhythm, time signature). The actions or verbs they mentioned to achieve the proposed learning are either manifest actions (sol-fa it, play it) or states referring to the learning already achieved (doing it, come out, know). Breaking the musical piece down (bit) was also mentioned. Typical responses of students at this level alluded mainly to the learning **outcomes** with relation to the notational elements in the score: *'study the key signature, the beat, the rhythm, the time signature, tonality change. Because this way, the rhythm of the song is easier to do because you know how fast the beat is, the time signature and the flats, sharps or naturals in the song'*. As **means** for the imaginary classmate to be able to play the score on his instrument, participants considered the amount of time spent, repetition of fragments and constant work: *'try playing the bits that don't come out and if they don't come out, don't despair because you can achieve anything through hard work'*. They were of the opinion that learning to play the piece at the speed indicated is acquired gradually, by playing it more slowly at first and gradually working up to the right speed. To do so, they suggested using an external tool, the metronome: *'set the metronome at half the speed indicated, and clap the rhythm'*; *'Sol-fa very slowly, with a metronome'*.

The main **difficulties** mentioned in this first stage are related to rhythm: 'he may find the rhythm difficult'; 'he may not know what a fragment is like (its rhythm)', or to overall difficulty: 'the difficult bits may not come out well'. **Solutions** to these problems were sought through quantity and constancy of work and repetition of difficult fragments.

Group 2. Located in the upper right quadrant, near dimension 2, formed mainly by the words any (masc.), any (fem.), articulations, each, something, to focus on, to correct, day, and, that (adjective fem.), exercises, performance, to perform, reading, to take, better, movement, parts, piano, little (adverb), *first, firstly, breaths, breathing*, 'se' (third person form of reflexive pronoun), will be, over, are, tempo, play, goes, to go and associated to level 3<sup>rd</sup> PD. The words *passages, to be, difficulty, rest, slow ['lento'], to begin, musical piece*, are shared by groups 2 and 3.

This group was characterized by words that implied a global approach to the score (performance, movement, reading) and words referring to the instrument or instrumental technique (breathing, breaths, articulations). They included verbs expressing learner's mental processes regarding attention (focus) and managing information (interpret, correct, exercises). The main learning **outcomes** proposed by students at this level refer to notational matters and elements related to the instrument itself (sound, breathing, articulation). The same matters were present in the potential difficulties in this first learning stage: *'keep good time'*; *'some rhythmic pattern difficult to sol-fa'*; *'some note or trill that's difficult to play'*; *'reading and correcting errors, breathing, ... is basic to be able to construct the rest'*. In order to achieve this learning and resolve the difficulties (**means and solutions**) they suggested using the metronome (as in

group 1) and graduating the speed, beginning slowly and increasing it gradually: *'by working on it with the metronome at a moderate tempo. Increasing the tempo to the tempo required for the piece'*. They spoke of breaking the piece down (parts, passages, movement) more articulately than the previous group did, taking into account segments with musical sense and higher level of complexity: *'divide into parts, first each movement, and then each one into bits. Set the metronome at a lower speed. Study the more complicated passages (even by heart)'*; *'the points that need working on in each stage should be within each movement. Because that way, you understand the piece better and fix concepts'*. They also suggested specific exercises for the technical difficulties: *'articulation exercises. Sound exercises using some part of the piece itself or another work suggested to him or that he thinks of'*.

This group, as well as group 1, referred several times to play the piece 'well': 'play until it comes out well' (4<sup>th</sup> ED); 'if you work hard on the piece it will come out well' (4<sup>th</sup> ED); 'if he does not learn the piece well, the mistakes will be more difficult to correct' (3<sup>rd</sup> PD).

Group 3. Located in the lower right quadrant, formed mainly by the words learning, aspects, to the, base, the (masc.), composer, correctly, gives, of, fingers, of the, fingering, a (masc.), listen, this, these, to study, to study it, study (noun), etc., phrase, hour, instrument, to measure, for, memory, same, nothing, problems, to do, would be, always, without, sound, to have, all, work, technique, technical, a (fem.), [historical] period, to work, working, and associated to level 6<sup>th</sup> PD.

In this group, as in the previous one, there were instrumental technical elements (fingering, fingers, sound, instrument, technical), but also terms referring to the stylistic and historic dimension of the musical piece (composer, period). Among the characteristic verbs in this group, there were some manifest actions for accessing information were outstanding (study, do, measure, work) and others involving mental processes (listens, learning, memory).

For students at this level, the initial stage was the right time to pay attention to notational features in the score (rhythmic matters or notes). Sometimes they suggested knowing the aesthetic context of the piece (**outcomes**). Both for this type of learning and in cases when the suggested outcome is to be able to play the piece 'without errors', they suggested listening to different versions of it (**means**): *'firstly, listen to different versions to become familiar with the piece'*; *'listen to the piece many times with the score and his instrument'*; *'by listening to different interpretations of the piece'*. This listening would help the imaginary classmate to *'become familiar with the piece'*, to *'notice more and more details, and gradually perfect it'*, which was not proposed explicitly as an outcome, but rather as the purpose of listening. The main **difficulties** expressed by these students were technical, mainly related to sound, its quality and production. As a **means** to learn rhythmic and notational matters and as a **solution** to the difficulties they mentioned, like the students at lower levels, changing the speed (starting more slowly and increasing little by little) with the help of a metronome. They also suggested as



solutions doing technical exercises (though they did not specify them), and isolating difficult passages to study separately. This delimitation was done considering the internal structure of the piece: 'study by delimiting the phrases, phrase by phrase'.

Some typical responses from these students included the mention of expressiveness as a learning outcome: 'seeking expressiveness in this technical work'; 'putting the piece on, listening to it and then approaching the way it should sound, not by imitating and doing exactly the same, but by giving it a rather personal character without deforming the original'.

## Stage 2

Three groups of associations between levels and words were found from the factorial plane of the CA performed on the aggregate lexical table according to 'Level' (Figure 2).

The groups were the following:

Group 1. Located on the left hemi-plane, mainly in the lower quadrant, formed mainly by the words accompaniment, previous, concert, increasing, well, that (fem.), forms, forte, easy, there is/are, instrument, 'le', 'lo', badly, melody, less, very, more, no, or, parts, perfect, because, you can, rhythm, fast, to know, you know, comes out, if, next, solve it, sound (noun), sounds (verb), 'te', to play it (fem.), to play it (masc.), already, and associated to level 4<sup>th</sup> ED. The words to, is ['está'], all, none, that (pronoun), speed, could, breaths are shared by groups 1 and 2. The words as, fingers, first, takes, that (masc.), stage, with, are shared by groups 1 and 3.

In this second stage, Group 1 was characterized by verbs such as know, play or come out, which underscore the result of learning, together with verbs such as solve and increase, which can be understood as linked to a process. It is true that students were explicitly asked about how to solve difficulties, so that this action was proposed in the formulation of the question. In this second stage, words related to the quality of learning also appeared (well, badly, perfect). The **outcomes** suggested by this group were mixed with the **means** and referred to playing the piece 'well': *'by stage two you have to play it well. In the first stage you already start to work on it, but when you reach the second stage, you start to perfect it'; 'learn the piece more or less without problems. Because if you don't know how to play it well, it won't sound well at the concert'*. In addition, they included playing dynamics and attaining the speed indicated. The latter was also mentioned as a **difficulty**, along with playing the whole piece without errors (technical and reading).

As **means** they suggested dividing the piece into bits or phrases and changing some parameter of the passage to study it: 'Playing the bits slowly at first and then increasing the speed a little. When you can play it fairly well, you can go working up to the speed indicated. And you move onto the next stage'; 'learn the dynamics. And the things that do not come out, he should practise them many times in different ways, for example: with different rhythms,



different order of notes...’ Other means were the amount of time spent and the figure of the teacher. The teacher can fulfill different roles, perceived sometimes as the main source of **solutions** to a difficulty (‘ask the teacher to see whether you’re doing it well, because otherwise you can’t know if it’s done well and you could play it badly at the concert’; ‘following all the teacher’s indications’), but other times as a source of **difficulties** (‘he can’t play at the right speed and doesn’t feel comfortable, and the teacher tries to make him hurry up’).

Group 2. Located in the upper right quadrant, formed mainly by the words tuning, to reach, before, to seek, movements, composer, they give, should, and, to be, style, to do, *dynamics* [‘*máticas*’], *metrics*, *for*, *piano*, to be able to, is able to, they know, would have, all (fem.), all (masc.), speeds, [historical] period, and associated to level 3<sup>rd</sup> PD. The words help, the (masc. pl.), it (neut. pers. pron.) are shared by groups 2 and 3.

Suggested **outcomes** were related to tempo and dynamics, i.e. to attaining the right speed for the piece and including the dynamics when playing, but also in articulation to stylistic and aesthetic elements (composer, period, style): *‘the metrics and the dynamics. The metrics are essential for coordinating the whole piece. The dynamics lend ‘grace’, character to the piece. Once you know the style, the character will help you perfect and distinguish the piece’*; ‘to attain the adequate tempo for the movement. Because tempo is an important factor so that the piece will have the composer’s intended character’; ‘by trying to interpret the dynamics that the composer intended by maintaining a balance between low and high notes’. In order to attain the speed indicated for the piece, they suggested some of the **means** already mentioned above: graduating the speed and using a metronome. To attain understanding of the piece at stylistic level, they relied on working with the pianist.

The **difficulties** expressed were rhythmical, technical and related to attaining the right speed. As **solutions** they suggested graduating speed, and modifying some parameter in the complicated passage (changes in rhythm, breaking down the passage, etc.).

Group 3. Located in the lower right quadrant, formed mainly by the words aspects, each, knows, to give, of, difficulties, fingering, dynamics [‘*dinámicas*’], different, day, difficulty, then, is [‘*es*’], this (adj.), listening, this (pronoun), these, form, studying, study (noun), phrasing, important, metronome, musical, music, musical piece, part, passage, passages, pianist, problems, points, sense, to be, over, to solve, ‘*su*’ (possessive adjective – his, her, its, their), to transmit, technically, techniques, technical, a (fem.), versions, time, and associated to level 6<sup>th</sup> PD.

Outstanding in this group were verbs related to the learning process and metacognition (know, listen, solve), and a communicative dimension was introduced (transmit), appearing for the first time. Work focused on both technical matters (technical, techniques, passage, metronome) and elements related to the musical sense of the piece (versions, dynamics, phrasing, musical, sense).

Resolution of technical problems and difficult passages was one of the main learning **outcomes**, since not being able to manage technical matters reduced confidence and therefore also performance quality: *'resolve the technical difficulties in the piece, and study the difficult passages. Because the absence of major technical problems will provide great confidence when playing, and knowing there are no problems in the difficult passages.'*; *'in order to perform a piece it is essential to overcome the technical difficulties. I believe that lack of confidence technically speaking reduces interpretative capacity'*. In some cases, they spoke of the importance of finding and endowing the piece with musical sense, rather than perceiving it as a succession of technical problems. As a **means** to achieve that expressive performance, they once again proposed listening to different versions and analyzing the score, specifically studying the complicated passages and the scores for piano or the rest of the instruments: *'studying these difficult passages separately and memorizing the notes, as well as endowing it with a sense of expression'*; *'you have to try to endow the technique with a sense of expression, using it to help solve these passages and make complex passages 'pretty''*; *'play chamber music with the pianist who accompanies the repertoire. Because it is important to make sense of the work'*; *'syntax analysis (phrases). Without it, music is simply a succession of notes. The next step after knowing the notes, rhythm, etc. is to endow them with musical sense'*.

The **difficulties** expressed, like the outcomes, were related to technical errors and to musical understanding and expression. The **solutions** mentioned were constancy, graduating speed, analysis and help from the teacher.

### Stage 3

Three groups of associations were identified between levels and words from the factorial plane of the CA performed on the aggregate lexical table according to 'Level' (Figure 3).

The groups were the following:

Group 1. Located on the right hemi-plane, mainly in the lower quadrant, formed mainly by the words accompaniment, to the, before, above, thus, although, well, mouth, pretty, song, when, after, speed, day, you know, that (pronoun), is [*'esté'*], final, does, to do it, to go, 'le', then, dynamics [*'matices'*], none, no, score, perfect, but, piano, because, comes out, will come out, non-stop, if, always, sound (noun), sounds (verb) [*'suena'*], 'te', has, you have, playing, you play, your, goes, and associated to level 4<sup>th</sup> ED. The words case, difficult, problem, is [*'es'*], little (adverb), yes are shared by groups 1 and 2.

This group was formed, as in stages 1 and 2, by some verbs related to learning as a finished state or action, with no mention of the process (play, do, come out, sound, have). Although notational elements were not so frequent, this group continued to focus on



articulation, sound and dynamics of the score. Words related to the quality of the learning outcome also formed part of this group (well, perfect, will come out, comes out).

The **outcomes** suggested by this group were notational matters (mainly dynamics and articulations), improving sound and playing with the accompanying pianist: *'add dynamics and articulate clearly. Because perfect dynamics and perfect articulation have to be introduced during the last steps'; 'do the dynamics and musical signs'; 'put the finishing touches on sound. Because to be able to play a piece, the main thing is sound'; 'study it with piano or accompaniment. Because otherwise, when the time comes for the concert, you won't know where the piano or you are'*. Although students' responses reveal the idea that learning is not acquired suddenly, they rarely mentioned the **means** by which it is acquired, and limit those to practice and gradual increase of complexity: *'he could read the accompaniment score. Do it slowly and when it's clear, do it as if it were a concert'; 'by playing the song many times'; 'articulation might not come out at first, but he shouldn't worry because it will come out with a little practice.*

The **difficulties** expressed were of technical/instrumental nature (articulation, dynamics and sound). The **solution** suggested was repetition, although no solution was specified for dynamics, it was simply understood that they would be acquired gradually: *'he can't do the dynamics and he could solve it by first pretending there are no nuances, and then gradually start doing them'*. Specific exercises were suggested for sound.

Group 2. Located in the upper hemi-plane, mainly in the left quadrant, formed mainly by the words any (masc.), *help, to let, the rest, to find, to listen, 'lo', the* (masc. plural), *to memorize, other, for ['para'], parts, to perfect, to be able to, teacher, they can, resources, to know, sounds (verb) ['suene'], we have, time, to play, to work on it, things, and associated to level 3<sup>rd</sup> PD. The words lack, stages, etc., exercises, previous, work, are shared by Groups 2 and 3.*

In Group 2 verbs were mainly related to processes by which learning is achieved (find, perfect, work, memorize), and the nouns referred to ways to learn or achieve learning (parts, resources, work, teacher).

The **outcomes** suggested by this group were related to confidence when playing, character of the work, interpretation and emotion: *'it's the moment when you really start to 'make music''; 'integrate all you learned and enjoy the piece (and make others enjoy it)'; 'find the character of the piece, because that is what will give it life and feeling when you play it. [...]* It's recommendable to be *very confident about the whole piece to be able to improvise, [...]* highlighting some things but not others, etc., until Juan finds the exact way that suits him and he *likes'*. In some cases, working with the pianist was mentioned as an outcome: *'perfect it with the piano. Because on the day of the concert you'll have to play it with the piano'*.

The main **difficulty** mentioned is related to not achieving enough technical skill to be able to play the piece as desired: 'he might find he lacks techniques for some resources such as vibrato or lack of air in phrases, etc.'; 'not being able to produce the ideas he has due to lack of technique or resources'. The **means** and **solutions** for difficulties were varied: harmonic analysis, listening to different versions to learn various interpretation perspectives, memorizing the difficult parts, doing exercises for sound.

Group 3. Located in the lower left quadrant, formed mainly by the words performance, tuning, something, analysis, aspects, to change, as, complete, composer, knowledge, manages *to, of, should, different, it, is* [*está*], *in, style, to study, study* (noun), form, phrase, has, until, *interpretation, 'la'* (it - accusative sing. of f. pers. pron/ the- f. form), *slow* [*lento*], way, moment, level, small, pianist, *putting, for* [*por*], *audience, 'se', sense, to be, solves, 'su', to play it, worked, to work, to transmit, techniques, all, one, times, musical piece, several and associated to level 6<sup>th</sup> PD.*

In this group, verbs referred to the learning process (study, solve, change, manage to), and also to communication (transmit). The nouns most often used by these students indicated greater attention to the artistic, musical and communicative dimension of music (performance, audience, composer, sense, analysis, knowledge).

In the **outcomes** suggested by this group, the aesthetic and communicative dimensions of the interpretation were frequently present: '*manages to play and present the musical piece as something beautiful, expressive and pretty, endowing it with complete sense and connecting with the audience*'. They conceived the piece as a whole, which needs to be understood globally and requires profound knowledge of the language, style and composer in order to be able to endow it with full musical sense. Importance was also attributed to the resolution of technical matters previous to that global approach: '*to understand the piece as a whole. Even if pieces are divided into phrases for their understanding, they must be a whole, so we need to understand it globally*'; '*I think it is important to manage to make a piece of music something that transmits a feeling, and something with authentic expression, and that can only be done after gaining in-depth knowledge of the piece and not having technical problems*'. The **means** for interpreting the piece were based on analysis and the job of *mis-en-scène*, as well as the rehearsals with the pianist and the exercises to overcome stage fright: '*by conducting a formal analysis that will help us interpret it, being consistent with the musical style, and knowing the musical-historical context where it was composed*'; '*with an in-depth analysis and sufficient technical knowledge, any musical piece can be tackled globally*'; '*working with the pianist or orchestra (on each parameter)*'. Because the musician is not aware of the piece until it has been interpreted as a *whole*'.

The main **difficulties** referred to the lack of technical mastery in previous stages and lack of aesthetic, historical and analytical knowledge which, together, would limit the quality of

the interpretation. The teacher was conceived as the most important help (**solution**) for interpretative difficulties: ‘work with the teacher on techniques for relaxation which can be *applied without difficulty*’; ‘*interpret the piece in the presence* of the teacher and the pianist as if it were the concert. It is important to be listened to by professionals and to hear their opinion’; ‘*not having knowledge of history of music, analysis or harmony. Only then can his teacher explain to him and help him, but he wouldn’t have autonomy*’. Other suggested solutions included different levels of analysis of the piece (historic, formal, aesthetic) and exercises to raise bodily awareness.

Table 4 summarizes the outcomes according to each stage, each level and the content of each question.

## **Discussion and conclusions**

The results of this study provide information that allows better understanding of how music students conceive the content (what) and the process (how) of learning a new piece of music, beginning with their first contact with it and up to its public performance, and provide information regarding the relationship between their conceptions and level of instruction, according to the levels in formal musical education.

The use of the lexicometric method in order to analyze students' answers to a structured set of open-ended questions has allowed us to obtain a very detailed qualitative description of the ways in which each group of students conceive learning within each stage of practice. Let us keep in mind that this description regards what and how students wrote about what and how they would learn a piece chosen by themselves. That is, we have carefully analyzed students' conceptions about learning practices –but not live learning practices. This other kind of research is being carried out nowadays by the authors, by interviewing a group of advanced students which showed either a simple or a sophisticated conception of learning elsewhere (see Marín, Scheuer, and Pérez-Echeverría 2012).

An overview of the results shows that there are a few trends in common to the three study stages. The three factorial planes show a strict developmental-educational progression, because the order of the three levels goes from one end to the other of the first factorial dimension (the horizontal axis of each factorial plane), and each level is associated to a lexical group: 4<sup>th</sup> ED to Group 1; 3<sup>rd</sup> PD to Group 2, and 6<sup>th</sup> PD to Group 3. In particular, this factorial dimension opposes Group 1 to the other two, suggesting that 4<sup>th</sup> ED students tend to talk of outcomes, difficulties, means and solutions in learning new pieces in a way that is clearly distinct from that of students in 3<sup>rd</sup> and 6<sup>th</sup> PD, between which the differences were subtler. This



Table 4. Outcome, means, difficulties and solutions suggested by participants in each learning stage.

STAGE	QUESTION	Level 4 <sup>th</sup> ED, associated to Group 1	Level 3 <sup>rd</sup> PD, associated to Group 2	Level 6 <sup>th</sup> PD, associated to Group 3
<b>Stage 1</b>	<b>Outcomes</b>	Notational elements	Notational elements Instrumental technique	Notational elements Knowing the aesthetic context of the piece
	<b>Means</b>	Graduating speed Using a metronome Repeating fragments Constant work Amount of study time	Graduating speed Using a metronome Breaking the piece down according to formal criteria	Graduating speed Using a metronome Listening to different versions of the piece
	<b>Difficulties</b>	Rhythm Difficulty expressed globally	Rhythm Technical difficulties	Rhythm Technical difficulties Difficulty with specific passages Sound
	<b>Solutions</b>	Amount of study time Constancy Repeating fragments	Graduating speed Using a metronome Breaking the piece down according to formal criteria and studying the fragments Specific technical exercises	Graduating speed Using a metronome Breaking the piece down according to formal criteria and studying the fragments Specific technical exercises
<b>Stage 2</b>	<b>Outcomes</b>	Attaining the indicated speed Dynamics Playing the piece well	Attaining the indicated speed Dynamics Character of the piece with relation to style and composer	Resolving technical problems Gaining confidence for interpretation Musical expressiveness
	<b>Means</b>	Graduation speed Dividing the piece into phrases Changing parameters Amount of time Help from teacher	Graduating speed Using a metronome Rehearsal with pianist	Listening to different versions Studying the piano score Studying specific passages Analyzing the piece

	<b>Difficulties</b>	Attaining the indicated speed Technical difficulties Teacher	Attaining the indicated speed Technical difficulties Rhythm	Musical comprehension and expression Technical difficulties
	<b>Solutions</b>	Graduating speed Help from teacher	Graduating speed Changing parameters	Constancy Amount of study time Endowing technical study with sense of expression Analyzing the piece Teacher
<b>Stage 3</b>	<b>Outcomes</b>	Sound Dynamics Articulation Practicing with pianist	Musical expression Give character to the piece Confidence while playing Practicing with pianist	Give full sense to the work with regard to style and composer Communicate and transmit feeling to the audience Rehearse mis-en-scène with the teacher and pianist
	<b>Means</b>	Practice	Listening to different versions Analyzing the piece Memorizing passages	Holistic analysis of the piece Relaxation and bodily awareness Help from and work with teacher and pianist
	<b>Difficulties</b>	Dynamics Articulation Sound	Musical expression (due to technical difficulties) Technical difficulties	Musical understanding and expression (due to technical difficulties and lack of knowledge) Stage fright
	<b>Solutions</b>	Specific sound exercises Practice	Specific technical exercises Becoming aware of the problem and available resources	Analyzing the piece Teacher Relaxation techniques

pattern persisted throughout the three stages into which we suggested that the participants should divide the study process. Thus, our first conclusion is that there are differences related to the level of training and that these differences undergo development, the sense of which we shall analyze below.

By analyzing participant responses, differences were identified in the content and process of learning suggested for the different moments of study, i.e. students did not approach what and how to study the piece of music in the same manner from beginning to end of the process, but suggested different outcomes, difficulties, means and solutions as they progressed. These variations were more noticeable among students in 3<sup>rd</sup> and 6<sup>th</sup> PD than among students in 4<sup>th</sup> ED, perhaps indicating a higher degree of planning in the approach of the formers to studying a musical piece.

Below, we describe the evolution of student conceptions by taking the questions as a base, considering first those about what to learn (outcomes and difficulties) and then those looking into how to learn (means and solutions). In order to facilitate the descriptions, we shall henceforth refer to elementary (4<sup>th</sup> ED), intermediate (3<sup>rd</sup> PD) and advanced levels (6<sup>th</sup> PD) when accounting for their conceptions.

#### What to learn: Outcomes and difficulties

As we have seen in the results (see Table 4), students at the three levels tended to mention at some point the notational elements of the score, when identifying the main learning that the imaginary classmate would have to acquire in each stage. However, only the elementary students selected these elements as learning outcomes for all stages. In contrast, intermediate students tended to highlight aesthetic and expressive aspects as from stage 2, while advanced students sought from the beginning to become familiar with the piece as a whole, which would in turn enable them to identify the difficult passages.

There is similar trend regarding the mention of technical skill, which was a goal shared by the students at the three levels, though in different ways. Elementary students regarded technique as an aim in itself in all three stages, while intermediate and advanced students regarded it as a tool for musical expression. They considered that the lack of certain technical skills limits the performer's possibilities of communicating. In addition to this view of technique as an obstacle to be overcome while acquiring a musical piece, advanced students added a positive view of technical skill upon saying that it enables expressiveness and is at the service of the performer for transmitting the musical message. To these advanced students, technical mastery together with other knowledge (aesthetic, stylistic, historic) are requirements for achieving personal interpretation.

Students attached greater importance to the expressive and communicative dimension of music as their level of instruction advanced, but also as they progressed in learning the piece. Elementary students did not talk explicitly about expressiveness, although they introduced it by means of related notational and instrumental elements, such as dynamics and sound. Intermediate students often tended to talk of ‘character’ when referring to the expressive outcome, to which, in their words, notational and technical elements contributed. The most advanced students, as we have just seen, tended to consider musical style and aesthetics right from the beginning of study, and that they were the most essential aspect during the final stage. Only these students paid special attention to the communicative function of music and took account of the multiple elements beyond notational and technical factors, such as the audience, *mis-en-scène*, preparation with pianist and teacher, composer’s idea and aesthetic current that the work is included in.

Taken as a whole, the standpoint of advanced students may be understood as a step prior to that reported in other papers for undergraduate music students and professionals (Bautista et al. 2012; Chaffin et al. 2003; Hallam 1995a), which stands to reason if we consider that advanced students who took part in this study are at the level immediately preceding higher musical studies.

#### How to learn: Means and solutions

Similarly, upon analyzing the results of studying, the different levels show some similarities as well as clear differences. All three levels mentioned graduating speed and breaking passages down as efficient ways to learn. Even elementary students suggested strategies for classifying and prioritizing information, which is expectable considering their ages. However, intermediate and advanced students widened the scope of activities suggested to the imaginary classmate, to include listening to different versions of the work, and harmonic and formal analysis, in agreement with previous studies (e.g. Hallam et al. 2012). They perceived classifying and prioritizing information as a subset among other activities that would allow the imaginary learner to take stylistic decisions.

Repetition, amount of time spent and constant work were considered necessary learning conditions for students at all levels, but they seemed to be determining, and even sufficient conditions for the elementary students, who believed that the more time and effort invested, the better the outcome would match the goals, and the more the interpretation would approach a perfect execution of the score.

Students’ use of verbs provides information regarding the type of processes they consider necessary for learning. Elementary students more often used verbs referring either to observable actions (play, sol-fa, do) or to mental status in which learning is considered to be

acquired (come out, know), in agreement with observations on approaches to learning in other domains of knowledge at the same ages (Scheuer et al. 2009) and to the less advanced epistemological beliefs (Perry 1970; Schommer 1990). Intermediate students were characterized by the use of verbs referring to information and attention management (interpret, memorize, focus), and to adapting to and approaching the object of knowledge (correct, perfect). This shows a higher degree of internalization of the agency of the learner, who manages his/her mental processes according to his/her aims. Some verbs typically used by advanced students were those related to achieving learning (solve, achieve, change) and in stages 2 and 3, the verb transmit, which suggests the idea that music plays a role of communication and transmission of ideas among the composer, the performer and the audience, which are words also associated to this group.

The role of the teacher also varied according to level. Elementary students tended to assign a determinant role to the teacher, considering that the teacher's actions could mean help with certain difficulties or, on the contrary, be the cause of those difficulties when the instructions imparted were inappropriate for the student's skills at that time. This role assigned to the teacher shows strong external management of the learning process, which is also reflected by the verbs used. Intermediate students made few references to the teacher, while advanced students made more frequent references to the teacher in the final stages of learning, where the teacher means help for solving difficulties, mainly of expressive and stylistic character.

### Final remarks

Conceptions of learning can be seen to develop over the three levels. As we have seen from the descriptions of the lexical groups, elementary students held a conception of learning in which there is a linear relationship between conditions and outcomes, such that if conditions are propitious (time to study, constancy, help from teacher), learning will take place. This kind of relationship is similar to that observed in younger children when learning in other domains, like writing (Scheuer et al. 2009). Their interest was centred mainly on reproducing isolated notational elements and developing the technical skill needed to do so. This position resembles Class 1 identified by Bautista et al. (2009) in pianists at a level similar to the one in our study, as well as the 'simple learning beliefs' described by StGeorge and colleagues (2012), identified in both younger and older learners.

Intermediate students highlighted notational and technical elements, but began to consider the internal structure of the piece and its expressive function, in agreement with different levels or classes identified by other authors (Bautista et al. 2009; Reid 2001). As we have mentioned, the activities named by these students assigned a high level of agency to the

imaginary classmate regarding his own learning, as they particularly emphasized mental processes.

Advanced students had a more sophisticated conception of learning than students at lower levels. They suggested more strategies, adapted to each aim and each learning stage. The level of understanding of the work was more complex, because they sought a global idea of it from the very beginning. They broke the piece down according to its musical structure in order to work on it in detail, and regarded technical skill as a tool for expressiveness, which is similar to the behaviour found by Hallam (1995a) in professional musicians as they started to learn a musical piece. This position also resembles Level 4 identified by Reid (2001), in which students sought to communicate the musical sense of the piece, although they did not regard it as an element for personal development and communication of their own ideas about music and the world, which would correspond to the last level (level 5) identified by this author.

We may thus draw several conclusions. Firstly, our results suggest that the higher the level of studies, the greater the development in learning goals leading to, on the one hand, students being more strategic, adjusting aims to the changing demands of the task, and on the other, bringing students progressively closer to the way that expert musicians approach a musical piece (Chaffin et al. 2003; Chaffin et al. 2010; Hallam 2001). Advanced students showed a higher degree of metacognitive skills, such as shown by studies carried out in other educational fields (Chi 2006; Mateos 2001; Zimmerman 2006).

Similarly, there are differences among the activities mentioned by the students. Elementary students focused on tasks related to the reproduction of knowledge while advanced students suggested activities requiring the integration of information from several sources and a greater degree of autonomy and reflection, resembling the different approaches to learning music (Cantwell and Millard 1994; Hultberg 2002; Rohwer and Polk 2006) as well as other subjects (Marton and Säljö 1976a, 1976b). Our results indicate that the probability of approaching the study of music in a given way is somehow affected by the level of musical training. This conclusion agrees with those obtained by studies in other fields, which found a similar evolution in the learning of other contents, such as reading and writing (Mateos, Martín, and Villalón 2006; Solé et al. 2005).

It seems therefore that in the educational context we have researched, a higher level of instruction helps the more advanced students to pay attention to several dimensions of music at the same time (technical, notational and aesthetic). The automation of many skills and knowledge as a result of practice might contribute to this multiplicity. Instead, less trained students need to pay attention to each of these dimensions separately, attaining only superficial understanding of the work, in which the expressive dimension is limited to learning to play with the appropriate dynamics and attention to sound. The possibility of paying attention to more elements at the same time seems to enable the development of a more global musical

representation, resembling the processes of representational re-description and hierarchic integration (Karmiloff-Smith 1994; Pozo 2008). In this change, the representation of more advanced students regarding what and how to learn still considers some of the same elements as students at lower levels did. Nevertheless, these elements take on a different significance when combined with others. This new significance sometimes depends on considering as necessary or enabling conditions things which were formerly regarded as the ultimate goal (e.g., technique), or considering as a mediating factor something that was formerly considered a determinant (the role of the teacher).

It seems noticeable that novice music students' conception and use of the musical score is similar to that shown by younger children when learning other representational systems (for a review, see Andersen et al. 2009; Pérez-Echeverría, Martí, and Pozo 2010). This could be due to the fact that musical learning usually starts later than the contact, learning and handling of other representational systems like written texts or numerical symbols. Therefore, it is possible that naïve learning conceptions (establishing a linear relationship between conditions and outcomes, conceiving knowledge as a state rather than a process, directing attention principally to notational elements) are characteristic of early steps in learning in any specific domain. This is in agreement with the idea of Schommer (2002), according to which conceptions are independent and context-specific. However, we should keep in mind that these naïve conceptions may also persist, since several studies have found evidences of them in advanced students or even teachers (Pozo et al. 2006; Bautista, Pérez-Echeverría, and Pozo 2010; López-Íñiguez, Pozo, and de Dios 2013). As mentioned in the introduction, in order to achieve more sophisticated conceptions it seems to be necessary that students and teachers take part in specific activities and spaces of reflection upon teaching and learning.

A certain degree of similarity is perceived between the development in the groups and the changes expressed by the students in the three stages of study. Although the responses given by less trained students differed less among these three stages, we found a general trend towards moving from a more fragmented study of the more notational or technical aspects during the first stages, towards considering the expressive dimension and a more global view in the final stages. Even though the most advanced students spoke of attaining a global view right from the start, its purpose was, among others, to detect difficulties and plan studies, as have been detected in other knowledge domains (Chaffin et al. 2003; Chi 2006; Hallam 1995a; Schoenfeld 1992). In other words, it would appear that these students considered that musical learning requires the simpler elements to be acquired first, in order to use them as a base upon which to acquire a more complex view of the piece.

This conclusion leads us to reflect upon the educational contexts in which students learn and, in particular, on the goals and strategies that music teachers believe are suitable to each level of instruction, or, in other words, on the conceptions of the teachers themselves. It is easy

to imagine that music teachers, as well as teachers of other subjects, may conceive learning as moving from the simpler to the more complex. However, although this conception may be suitable for teaching certain procedures, particularly techniques, it is not so clear that it is equally appropriate for other outcomes, such as the sense and significance of the musical piece. It is therefore essential to know what conceptions teachers hold in order to gain in-depth understanding of the process of learning and teaching, and to suggest new teaching designs. These conceptions have been researched recently in various domains, including the domain of music (Bautista and Pérez-Echeverría 2008; Bautista, Pérez-Echeverría, and Pozo 2010; López-Íñiguez, Pozo, and de Dios, 2013). As stated by Marton and Säljö (1976a, 1976b), the educational demands that teachers propose students influence the kind of approach they adopt and, ultimately, their understanding and learning outcomes.

Upon interpreting and appraising the scope of the results of this study, it is important to consider the distance between strategies that students may talk about and those they are actually capable of implementing in a learning situation, which are usually more basic than the ones they mention (Flavell 1976, as quoted in Hallam et al. 2012). Since learning strategies and approaches affect the final outcomes of the learning processes (Marton and Säljö 1976a, 1976b; Schommer 1993), it would be of interest to analyze the relationship among the suggestions gathered in a study of this kind, the learning process that students undergo and its outcomes.

A variety of study methods and approaches are needed in order to gain fuller understanding of students' representations of learning. It is therefore relevant to analyse what students say as well as the activities they actually put into practice when learning.

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