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Gestural Learning in Orchestra Conducting Through Self-observation☆

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ABSTRACT

The Orchestra Conducting training has traditionally been based on the imitation of the gesture of experienced conductors. It has only recently begun to work on other methodological alternatives for the teaching of gesture in the orchestral conducting. In this research, gestural learning in this field has been approached by means of self-observation through video with 28 students from first course in Conducting at Higher Music Education Conservatoire of the Basque Country – Musikene. The results have shown that with this methodology the participants' gestural activity has improved, especially in those competencies more difficult to acquire, such as facial expression, visual contact and the use of the left arm. Significant differences have also been revealed in the improvements produced over time and in the assessments of the different types of judges involved. Gender differences have not been significant, but it is worth mentioning that women in this study have scored lower (themselves and others) than men.

El aprendizaje de la gestualidad en Dirección de Orquesta mediante la auto-observación

Palabras clave:
Competencias gestuales
Auto-observación
Hetero-observación
Dirección de orquesta
Video feedback

RESUMEN

La formación en Dirección de Orquesta se ha basado tradicionalmente en la imitación del gesto de directores experimentados. Solo recientemente se han empezado a considerar otras alternativas metodológicas para la enseñanza de la gestualidad en la Dirección Orquestal. En esta investigación se ha abordado el aprendizaje gestual mediante la auto-observación a través del vídeo de 28 estudiantes de primer curso de Dirección del Centro Superior de Música del País Vasco, Musikene. Los resultados han mostrado que con dicha metodología ha mejorado la actividad gestual de los participantes, sobre todo en las competencias más difíciles de adquirir, como son la expresión facial, el contacto visual y el empleo del brazo izquierdo; asimismo se han puesto de manifiesto diferencias significativas en las mejoras producidas en el tiempo y en las valoraciones de los distintos tipos de jueces intervinientes. Las diferencias en función del sexo no han sido significativas, pero es reseñable que las mujeres de este estudio han puntuado más bajo (a sí mismas y a los demás) que los hombres.

Introduction

The profession of orchestra conductor within the framework of Western classical music is one of the newest in the field of musical performance – around 150 years – and the field of training in this area is even more recent – around 50 years (Brandão, 2011). That is why no agreement has yet been established on how to teach it, and as a consequence, there is an absence of methodological approaches and references in didactic issues in the Orchestra Conducting and should lead us to reflect on the reasons for this state of affairs. We share with Brandão the idea that what really underlies is the fact that the conductor is still considered more a myth than a professional whose activity can be taught and learned.

The Orchestra Conducting has traditionally been an eminently practical art, with great doses of oral transmission of knowledge, more understood as advice of veteran teachers to beginners pupils,

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than as theoretical and technical concepts that should necessarily be argued, written and ordered in methodological proposals (García Vidal, 2011), and the teaching has been one-to-one. So far, the training of students in this specialty has been based on imitation and a reproductive model that does not allow personal styles. From all this, it is necessary to update the process of learning in this area through the introduction of new methodological approaches, strategies and didactic tools to promote a learning that responds to a socio-constructivist model incorporating, in addition to individual activities, collective activities that promote the collaborative work and the interaction between the apprenticeship community. It is also essential to promote autonomous learning and critical reflection so that the student discovers the aspects that must be changed or improved and is able to solve the problems that he or she faces when acting as conductor, thus putting in place a self-regulating approach that enables lifelong learning.

The frame of the reflexive approach that is presented in this research is the awareness of the own gestural action on the podium as motor of the process of development. As stated by Knezedvic, "the development of consciousness is a process that reduces the discrepancy between what we do and what we believe we do" (cited by Bailey, 2009, p. 39).

The gesture and the communication in Orchestra Conducting

Flusser (1994) argues that the gesture is a movement of the body or of an instrument attached to it – in our case, the baton – for whose understanding it is necessary to discover its "meanings". Silvey (2011) states that Orchestra Conducting students should initially focus their efforts on developing and improving skills in non-verbal communication such as gesture and eye contact. Gestures in conducting are polysemic entities whose exact meaning becomes evident only when they take place in a specific context (Poggi, 2002). On the other hand, Sousa (1988) shows that there are concrete gestures or "emblems" used in Orchestra Conducting that result in having a specific musical meaning agreed with the instrumentalists. The results of his study also indicate the need to train the musicians in the meaning of many of these gestures, since it suggests that not all the gestures used in Conducting are understood automatically by all the instrumentalists. There are movements when conducting that function apparently as visual metaphors, some with many parallels with sign language (Bräm & Braem, 2001). Academic texts emphasize the need for all gestures made from the podium to have a communicative intention. However, for this communicative intentionality to take effect it seems necessary to attribute consensual meanings to the gestures of the conductor (Lorenzo de Reizabal, 2010). This attribution of meaning is so far undefined in the literature consulted, except for those referring to the basic gestures of beat patterns.

The gesture in Conducting includes voluntary movements and to develop the gestural abilities the development of motor skills is necessary (Bodnar, 2013). Neuroscience and motor behavior research have shown that people are not necessarily aware of the body movements we make, but rather of the intentions of the movement (Jenkinson & Fotopoulou, 2010). Given that conductors do not see themselves while conducting concerts or rehearsals, they must rely on proprioceptive feedback and feedback from the audience. It is for this reason that Bodnar defends a pedagogical line in which during the study the movements to be used are planned. This planning of the gesture aims, on the one hand, to expand the gestural vocabulary of the students and, on the other hand, to promote the motor self-consciousness. Against the pre-planning of the gestures it can be argued that then the students focus their attention exclusively on their own movements, instead of putting the focus of attention on the sound that is producing the orchestral ensemble. Another argument against this practice is defended by researchers like Duke, Cash, and Allen (2011) who find in their studies that motor learning is more successful when the focus of attention is put beyond the motor skill itself.

Self-observation through the video

The video constitutes an invaluable auxiliary in educational research as a tool in the service of the study of thought in action, analytical thinking, cognition and metacognition (Tochon, 2008). The pedagogy through video, according to Tochon, is based on methods that lead to the emancipation of the participants. This aspect is of particular interest in the scope of this study, since it is intended that each student of Conducting classroom builds his/her own personal style in the field of gestural communication by means of self-observation through video, promoting not only an improvement of learning, but also the construction of his/her own identity as a conductor and his/her future professional autonomy.

In this research, and in line with the premises presented by Anguera (1993), an attempt has been made to combine the ideographic and nomothetic, as well as the observation of sequenced events and concurrent events in the same behavior. The aim is for the students to get by themselves not only to discover the aspects he/she wants or must change or improve, but to seek solutions and evaluate them by themselves. They thus enter into a self-regulating dimension of great importance for autonomous learning. However, for self-observation to be effective, the student must be prepared to distance himself from his/her performance and know how to observe it in a more objective and conscious way, as Esteve (2004) warns.

Pasek and Matos (2008, p. 41) define observation as "the act in which the spirit captures an internal (perception) or external phenomenon and registers it with objectivity." This perception, they add, promotes "behaviors of contemplation, curiosity, reflection, investigation, visualization of events from the outside world and the inner world." It is also of great interest for this research *introspective observation* defined as a private, personal reflection, in which it turns the gaze toward oneself and its action, toward what has happened on the podium, toward the own perceptions and reactions and those from the other subjects involved in the classroom (Esteve, 2004). This type of observation has been widely used in the field of the practical training of teachers and has full validity in the context of the Orchestra Conducting classroom, both for the teacher's reflection and for the reflective introspection of each student when observing their own gestural performance.

There is a very relevant aspect that emerges from self-observation through video: the importance that recordings can achieve to confirm or refute the beliefs that Orchestra Conducting students have about themselves, that is, their self-concept as (future) conductors.

Feedback through video in research with teachers (Ruiz-Bikandi, 2007) is manifested as a technique that reveals the hidden and awakens strong resistances in the subjects to be recorded but, at the same time, acts as a methodological instrument of great power to service of self-knowledge and reflection within the groups of teachers and students. Hermida (2013) says that the recordings allow students to become aware of the attitudes they experience toward themselves, that is, how they value their professional image and what are the feelings that encourage them to see themselves as future conductors.

From a didactic point of view, an innovative practice in the classroom would be to reduce individual teaching to a minimum by enhancing the group teaching; this would make it possible to have a collective that helps to construct social knowledge from a socio-critical perspective (Allan, 2006), taking advantage of the collective scaffolding that can be provided by the group. To share experiences, to observe oneself and to observe others, to develop constructive

debates and criticisms, to reflect on what happens to one, what is happening to the other, to collaborate, to learn from others, to awaken the self-consciousness of one's own movement, through the look of the other and of the self-view, the errors and successes, the possibility of "rehearsing" the classmates through simulation practices and a long etcetera, are some of the possible benefits of collective classes that have not been explored until now in this area.

Objectives of this research

This research pursues the following main objective: to analyze the changes that occur in the gestures of students of Orchestra Conducting of the Conservatoire for Higher Music Education of the Basque Country (Musikene) through the use of self-observation.

Associated with this main objective are the following specific objectives: (a) to inquire whether the self-observation through the video improves the gestural competences of the Orchestra Conducting students; (b) to verify if there are differences in the way in which the gestural competences are valued according to the type of judge and gender; (c) identify which gestures are most susceptible to improvement through self-observation.

Method

Participants

The participants are 28 students and the teacher of the subject of Orchestra Conducting. The students are 14 men and 14 women who take a course of 1st year of Orchestra Conducting in the specialties of Pedagogy, Composition and Interpretation in Musikene during the academic years 2013–14 and 2014–15. Of these 28 participants, 13 do so during the academic year 2013–14 and 15 during the 2014–15. The ages of the participants range between 18 and 19, which is the usual age of beginning high school music.

In the collection of data, three types of judges or evaluators participated: each student evaluating himself (self-evaluation), each student evaluating the other students (peer-evaluation) and the teacher evaluating the participants. The maximum potential for the collection of observations is 422: 182 in the first year and 240 in the second year (Table 1).

Instrument

For the data collection, the Orchestra Conducting Gestural Competencies Scale (OCGCS) of 27 items (Table 2), constructed for this experience, has been used, since no scale or form to measure the gestural competence has been found in the literature on Conducting. The 27 elements of this scale (dependent variables) correspond

Table 1
Distribution of the total of the observations collected in each phase and according to gender and type of judge

	Observations	Judges gender		Students gender		Type of judge		
	n	*M* *n* (%)	*F* *n* (%)	*M* *n* (%)	*F* *n* (%)	Peers *n* (%)	Teacher *n* (%)	Myself *n* (%)
Phase 1	410	192 (46.8)	218 (53.2)	197 (51.6)	185 (48.4)	354 (86.3)	28 (6.8)	28 (6.8)
Phase 2	416	197 (47.4)	219 (52.6)	199 (51.3)	189 (48.7)	361 (86.8)	28 (6.7)	27 (6.5)

Note: F: female, M: male.

Table 2
Orchestra Conducting Gestural Competencies Scale (OCGCS)

Dimensions	Associated gestures	Indicators	Variables
Tempo	Starting upbeat	Relationship upbeat-tempo	V1
	Speed maintenance	Pulse stability	V2
	Tempo terms in the score	Fit to score	V3
	Tempo changes	Correct preparation of tempo changes	V4
		Correct setting of new tempo	V5
	Agogical changes (accel. and rit.)	Progressive changes	V6
Rhythm and Metric	Beat patterns	Beat stability inside patterns	V7
		Patterns technically correct	V8
	Polymetries	Accuracy in metric changes	V9
	Proportion changes	Accuracy in proportion changes	V10
Cues	Preparations for cues	Gestures technically correct	V11
	Use of left arm when giving cues	Left arm independence	V12
Articulation	Legato	Correction in 1:1 relations	V13
	Staccato	Correction in 3:1 relations	V14
	Change of articulation	Clarity in articulation changes	V15
Dynamics	Different degrees of dynamics	Adjusting the size of the gesture to the intensity of the sound	V16
	Dynamic changes	Preparation of changes	V17
Phrasing	Use of the left arm	Plasticity of gesture	V18
	Separation of phrases: caesuras and breaths	Gestures technically correct	V19
	Interruption of movement: pauses, fermatas	Adequacy of resting time	V20
		Anacrusa for resumption of the tempo	V21
	Final cut off	Adjusted to dynamics	V22
		Adjusted to articulation	V23
Character of the music (musical expression)	General body attitude	Correspondence body/music character	V24
	Face expression/eye contact	Correspondence facial expression/music character and eye contact frequency	V25
	Expressive use of the left arm	Degree of involvement of the left arm in expressiveness	V26
	Character/expression changes	Preparations technically correct	V27

Source: Self-made.

to the fundamental aspects in gestural technique in Orchestra Conducting and for its elaboration an exhaustive revision of the most relevant academic treatises and texts on the matter has been made. Each of these variables has been measured using a Likert scale that measures (between 1 and 5) the presence and degree of correction of these gestures in the participants' performance.

Procedure

This research has been carried out according to the Declaration of Helsinki and the Ethics Committee of the University of the Basque Country for research with human beings. Students have freely participated and signed informed consent prior to the commencement of the investigation.

The experience takes place during the months of April and May of the mentioned courses. Participants have received instruction in Orchestra Conducting during the first semester and part of the second, being trained both in the gesture and in a methodology of analysis of the score to conduct, although this instruction has so far been advised and directed by the teacher. Classes have not been recorded on video previously and have not arranged for an orchestra of musicians to interpret the scores that are prepared each week in the classroom. In order to isolate and measure the variables of this research, a two-stage experimental situation has been designed so that the study of the observations generated in them can account for the incidence or effect of observation on gestural learning.

In this design the independent variable is the type of observation with two modalities: self-observation and peer-observation, and the dependent variable is the conducting performance or the set of gestures that the conductor performs when conducting. In each experience, the three types of judges (the students and the teacher assessing the performance of each student and students self-evaluations) have judged the participants' gestural performance in the two phases designed.

Phase 1

Each participant is distributed a different score with similar musical characteristics and unknown to them in order to prepare and conduct it in front of a chamber orchestra of 15 musicians. They have a week for their individual preparation without the help of the teacher. After this period, each performance is video-recorded. During this execution are present all the companions of the class of conducting (the participants) and the teacher/researcher. Once the performance of each participant has been completed, it is valued by the following judges: (a) the classmates, (b) the teacher, and (c) each student himself. To score the items the OCGCS scale has been used.

Phase 2

Each student collects the recording of their performance in Phase 1 and receives no feedback from the judges. Students have another week (period of time between classes) to watch the video and reflect on the successes and mistakes made in the course of their performance. In this Phase 2 each student returns to conduct the same work of Phase 1 and all the participants complete again the scale OCGCS relative to this second performance.

The study can be considered longitudinal (Arnau & Bono, 2008). This type of longitudinal design is more efficient, robust and statistically potent than transverse designs and conventional transverse designs of repeated measurements in which the sample analyzed changes according to the situations or times analyzed. Likewise, the number of subjects necessary to establish solid conclusions is smaller than in conventional designs (Morales, 2011) and allow to eliminate residual variation due to within subjects differences, since all the subjects are used throughout the process.

Data analysis

A previous study of the data files corresponding to each experimental phase has been carried out; in each file the lost values and the outliers have been analyzed. The analyzed files had a low percentage (1.5%) of missing data. These were replaced by means of Multiple Imputation. The non-existence of relevant patterns in the missing values and the non-significance of the Little MCAR test (Phase 1: *Chi-square* = 945.045, *gl* = 973, *p* = .734, Phase 2: *Chi-square* = 703,121, *gl* = 770, *p* = .959) make it possible to guarantee that the missing values can be treated by multiple imputation techniques. This technique has been chosen because it ensures the lowest type I and II errors, and facilitates robust conclusions (Cuesta, Fonseca-Pedrero, Vallejo, & Muñiz, 2013). No outliers have been found that would advise their deletion.

An evaluation of the fit of the data to a bifactorial model composed of a general factor and the seven specific factors listed in Table 3 has been done, using Structural Equation Models (SEM) with the Unweighted Least Squares estimation method. To evaluate the fit of the data, the following indexes are used (Muthén & Muthén, 2014): ratio χ^2/gl (χ^2/gl cutoff $\leq$ 2, Tabachnick & Fidell, 2007); goodness of fit index (GFI) (GFI cutoff $\geq$ .95, Hooper, Coughlan, & Mullen, 2008); NFI normalized index and Tucker–Lewis index (TLI) (NFI, TLI cutoff $\geq$ .95, Hu & Bentler, 1999); the mean squared approximation error (RMSEA) (RMSEA cutoff $\leq$ .06, Hu & Bentler, 1999); and the root mean of the standardized RMSR residues (RMSR cutoff $\leq$ .08, Hu & Bentler, 1999). Complementarily, the indexes that measure the Extracted Mean Variance (VME), the construct reliability and the McDonald's Omega index have been calculated.

For the analysis of differences in each of the factors studied in this research, we used the total value of the scale obtained by adding the total of the valuations of the items. In the case of the teacher and self-assessments, these totals are the results of the indicated transformation; in the case of colleagues, the average of all colleagues' total assessments has been taken for each subject. For the analysis of the differences of means has been used an Analysis of Variance with repeated measures using the General Linear Model. It has been considered a factor within-subject: time or phase, which has two values: Phase 1 and Phase 2, and two factors-between subjects: the type of judge (with three categories: peers, teacher and myself) and sex. All analyses were performed with the SPSS v22 program and the R v3.4.0 packages: Psych, Lavaan, SEMPlot and SEM Tools.

Table 3
Fit indexes

	χ^2/gl	RMSEA	RMSEA IC 90%	GFI	NFI	TLI	RMSR
Phase1	1.98	.049	.043, .055	.984	.978	1.000	.066
Phase 2	.98	.000	.000, .018	.986	.981	.987	.062

Note: GFI: goodness of fit index, GL: degrees of freedom, NFI: normalized index adjustment, RMSEA: mean square approximation error, RMSEA 90% CI: 90% confidence interval of RMSEA, RMSR: mean root of standardized residuals and TLI: Tucker–Lewis index.
Source: Self-made.

Table 4
VME, Construct reliability and McDonald's Omega of each phase

Phases	Factors	VME	Construct reliability	McDonald's Omega
Phase 1	F1	.535	.991	.999
	F2	.602	.985	.993
	F3	.531	.997	.988
	F4	.591	.964	.989
	F5	.692	.828	.739
	F6	.598	.966	.977
	F7	.657	.879	.961
	G	.594	.944	.995
Phase 2	F1	.607	.988	.993
	F2	.592	.992	.886
	F3	.480	.990	.893
	F4	.636	.923	.690
	F5	.653	.877	.900
	F6	.506	.979	.852
	F7	.634	.924	.757
	G	.586	.914	.906

Results

Metric properties of the instrument

Validity and reliability indexes (Table 4) show a reasonable convergent validity (VME >.50, with the exception of Phase 2 factor 3) and reliability (reliability of construct and McDonald's Omega >.7) according to the recommendations of Nunnally and Bernstein (1994).

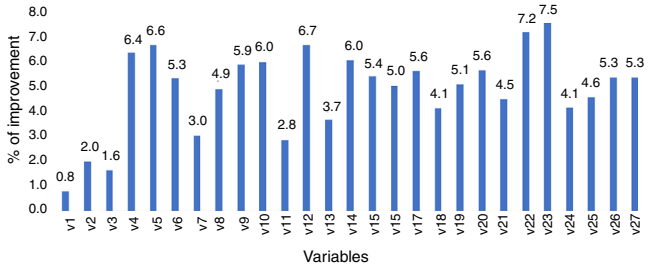

Figure 2. Percentage of improvement of each variable between Phases 1 and 2.

Evolution of the gestural variables between Ph 1 and Ph 2

The study of time evolution of the scale scores tries to answer the question of whether there are changes in the gestural competences by means of a scenario of self-observation. In order to do this, we have studied how the scores of each scale variable and its total in each phase of the experiment, and the differences of score according to the type of judge (teacher/peers/myself) and gender.

Comparing the evolution of the mean scores of the gestural variables between both phases, all of them show an improvement over the first practice, although the graphic profile of the means in both practices is very similar (Figure 1). The above differences are significant in all cases except V1. We found $p < .05$ (V2 and V3), $p < .01$ (V7 and V11) and $p < .001$ (in the other variables). In all of these cases the effect size measured by Cohen's *d* (2008) is between .123 and .391.

The variables with the lowest score in Phase 1 correspond to gestures of expressive type, specifically those related to the use of the left arm, as well as the preparations of the dynamic changes and articulation changes. The variables with the best average score in FPh1 correspond to the most basic aspects of the rhythm and metric dimensions, which are the first gestures that are addressed in the technical instruction of the students.

The variables with best score in Phase 2 have been related to the stability of speed, pulse, beat patterns. The final cut of the music score and facial expression are added to the group of items most valued. The variables with lower mean scores coincide with those of Phase 1, although with a higher score: they have experienced a small but important improvement because they are the most difficult gestural aspects to acquire.

One of the questions of this study is to identify which gestures may be susceptible to improvement and which ones not in a self-observation practice under the described conditions. In order to do so, we have calculated the percentages of improvement experienced by the 27 gestural variables of the scale between Phases 1 and 2 of the self-observation experience, the results of which are shown in Figure 2.

Variables that have experienced a greater change between the two phases, pointing to a clear overall gestural improvement of the participants are: V23 (final cut adjusted to the articulation), V22

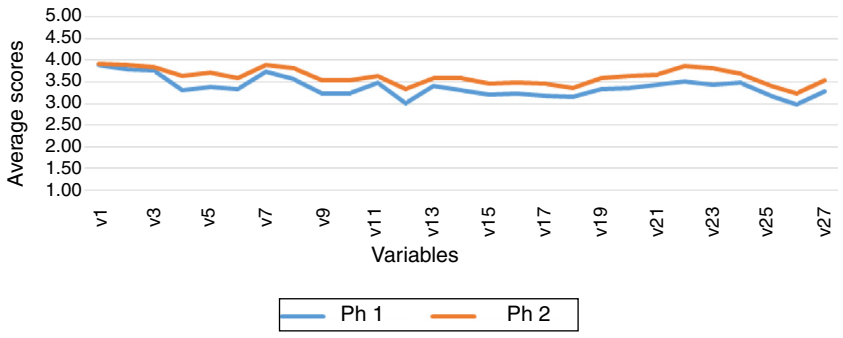

Figure 1. Evolution of means of the 27 items of the scale between Phases 1 and 2.

(final cut adjusted to the dynamic), V12 (independence of the left hand), V5 (tempo changes) and V4 (preparation of tempo changes).

Other variables whose improvement is noteworthy are those corresponding to V10 (changes in proportion), V13 and 14 (*staccato* presents greater improvement than *legato*), V9 (metric changes), V17 (dynamic changes) and V20 (rest time in pauses). All variables involved in expressiveness have shown improvement: V26 (left arm expressivity), V25 (facial expression/visual contact), V18 (left arm in phrasing) and V24 (general body expressivity).

The gestures that have improved very discretely in Phase 2 are the variables 1, 2 and 3 that started from the highest means in Phase 1 and are the basis of the gestural technique in the early stages of learning (upbeat for starting, stability of *tempo* and adjustment of *tempo* to the score).

Evolution of means according to the type of judge

The assessments issued by the different types of judges in the two phases have been significant ($p < .001$, $\eta_p^2 = .563$, $1 - \beta = 1$); the differences between types of judges remain significant regardless of the sphericity assumption. In relation to the scores according to the type of judge, in Phase 1 it is clear that the pairs are the most benevolent; the self-assessments are lower than those issued by the colleagues and the lower averages correspond to the teacher's scores (Figure 3). The total average score is 91.27.

In Phase 2, the results differ significantly ($p < .01$; $d_{colleagues} = .4$; $d_{teacher} = 2.1$; $d_{myself} = .5$) from the previous phase, as reflected in the following graph (Figure 4). The scores issued by all of them have experienced a modest improvement in Phase 2, but with notable differences among types of judges: students are still more generous with each other than with themselves when evaluating, while the teacher has awarded the highest scores (Figure 5).

Evaluation of gestural competences according to gender

In relation to gender, the scores emitted by the observers show differences depending on it. The multivariate ANOVA tests

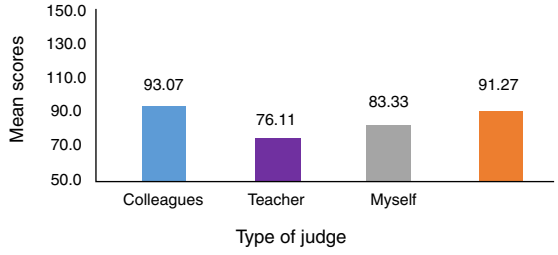

Figure 3. Mean scores in Phase 1 according to the type of judge.

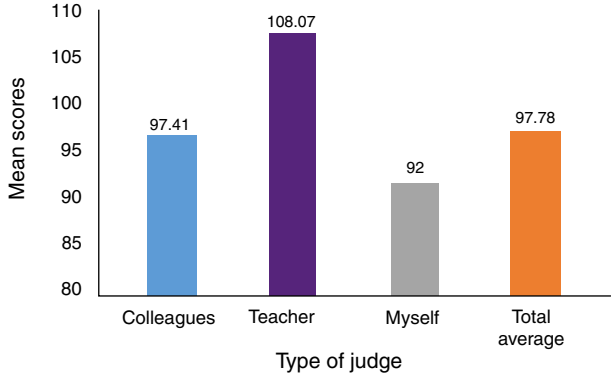

Figure 4. Mean scores in Phase 2 according to the type of judge.

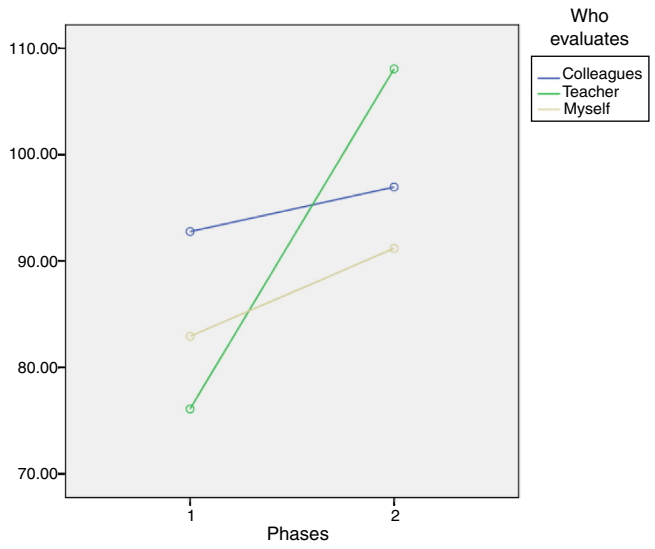

Figure 5. Evolution between the two phases of the average scores according to the type of judge.

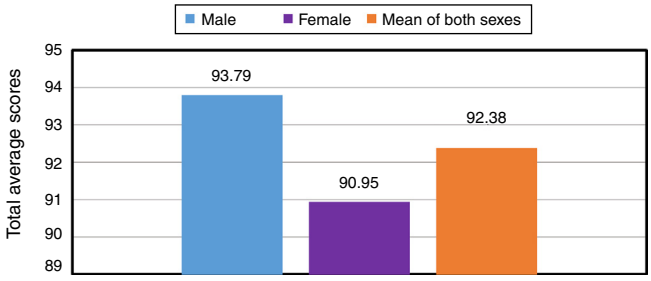

Figure 6. Total scores of the scale according to the gender of the observer in Phase 1.

show that there is no significant interaction (regardless of the sphericity assumption) between phases and gender ($p = .119$, $\eta_p^2 = .031$ and $1 - \beta = .344$), nor between phases, gender and type of judge ($p = .298$, $\eta_p^2 = .031$ and $1 - \beta = .261$). However, given the exploratory characteristics of the investigation, an analysis of such differences has been included, albeit limited by the scope of its mentioned non-significance.

Under the heading "observer" we have considered the gender of the students, not including the teacher. Thus, we see that the total scores of Phase 1 are higher in the male-observer. The difference in the emitted scores is 2.84 points higher in men than in women, as can be seen in Figure 6.

In Phase 2, there are differences between the scores issued by men and women, with the latter being 5.33 points lower. The difference between the scores emitted by observers of both sexes has increased, due to an apparently more critical assessment of the female observers than those of the male observers. In both sexes, the assessment of the items between the two phases has increased (Figure 7).

The scores on the self-assessments according to gender in both Phases 1 and 2 follow a pattern quite similar to that already mentioned. As can be seen in Figure 8a and b, the self-assessments of the male participants in Ph1 are also higher than those performed by the women on their own performances, with an initial score difference of 3.46 in favor of the men. In Ph2 the self-assessment scores show the same trend. The self-evaluations carried out by the women are the lowest, which points to a greater self-criticism,

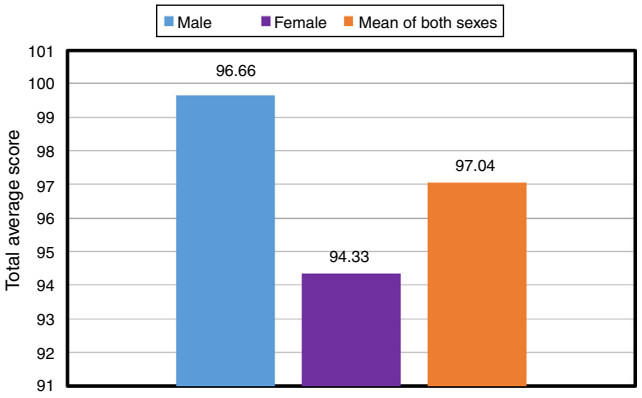

Figure 7. Total scores of the scale according to the gender of the observer in Phase 2.

since the teacher/researcher has not observed that the actual performance of the female students was worse than that of the men in general. In this post-observational phase, the difference in self-assessment scores is 12.16 in favor of men, a much larger difference than that observed in Ph1 self-assessments. Also, the perception of improvement between both phases is greater in the case of male students (13.31 points of total improvement), while female students have perceived an improvement between both phases of only 4.61 points (Figure 9).

Discussion

The mean scores of all the analyzed gestural variables have experienced an improvement between Phases 1 and 2 of this self-observation experience, confirming the expectations already verified in other educational areas that self-observation through video constitutes an effective tool also in the learning of the gestures in Orchestra Conducting. The results of general gestural improvement obtained in our study are coincident with previous research on self-observation through video (Bodnar, 2013; Tochon, 2008).

The variables related to the stability of the pulse, tempo, correction of the basic figures and the *anacrusa* for the beginning are the gestures with highest average qualifications in Phase 2, but they are not those that have experienced a greater improvement since they have already started from a higher score than the rest in Phase 1. They have improved in a considerable proportion: the final cut, the independence of the left hand in the entrances/cues and the preparation and correct establishment of the changes of tempo. These are more advanced skills in the gesture of a novel conductor and clearly more complex than those with which participants began the first practical experience.

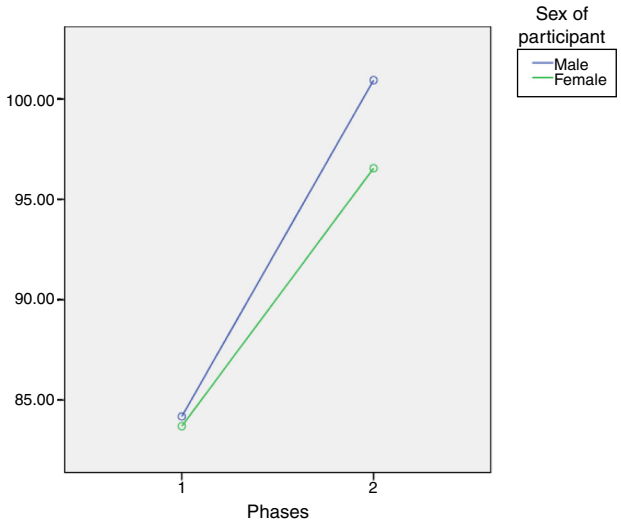

Figure 9. Evolution of the total means between the two phases according to the gender of the participant.

The improvement experienced by the variables related to the preparation of *tempo*, proportion, character or dynamic changes, reflects one of the most complex aspects in Conducting: the ability to prepare events that are going to happen in music at least one pulse/beat before they take place. These results point clearly toward gestural maturation in aspects that demand a higher level of competence than the one shown in the first practice in these same variables. These results coincide in part with the research by Silvey and Montemayor (2014) who report that although all participants in their study feel that they have easily conquered the beat patterns, they express their difficulties in incorporating the left hand as well as in leading the group with conviction and maintain eye contact. In our study, the participants have experienced a discrete but clear improvement in the variables related to the use of the left hand and eye contact.

It is necessary to point out the importance of the left arm in the preparation of changes in music (whether dynamic, *tempo*, articulation, expressiveness) to understand that the improvement of the above variables represent a real advance in gestural technique. The improvement in the scores of these variables may seem small, but it must be taken into account that this improvement has taken place through an experimental self-observation practice without any help from the teacher and within a week of individual work of each participant with his/her recording at home. It would be foreseeable that with the repetition of self-observational practices this percentage of improvement could increase progressively and very effectively, which would lead to a notable improvement over traditional instructional methods.

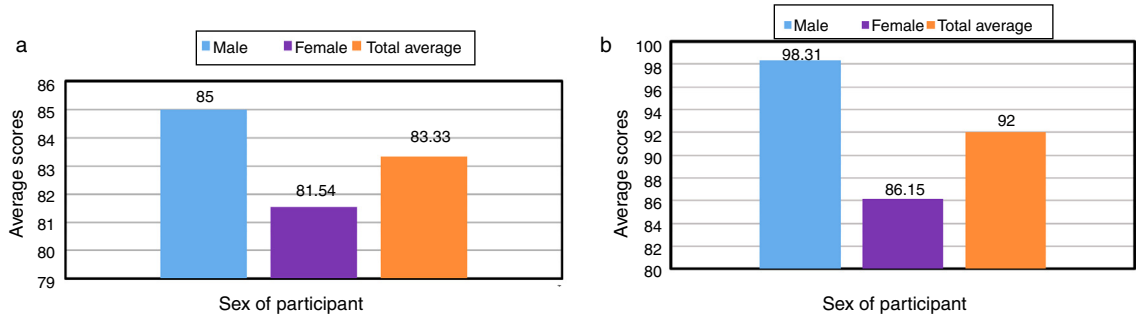

Figure 8. (a and b) Comparison of the total means of self-evaluations between Phases 1 and 2 according to the gender of the participant.

The variables of expressiveness have obtained the best means in Phase 2, although less striking, but suggest an awareness – the self-awareness – of what the gesture can and should communicate connected to the music, pointing to that the students have put mechanisms to try to communicate in an expressive way the music they are conducting, focusing their attention more on this that on the motor action itself.

The analysis of the emitted scores indicates that there are differences according to gender: the women carry out evaluations more critical than the men, and women too are more critical to themselves than to their peers.

As for judges' evaluations, the results indicate that students have been more critical with their own performance (self-evaluation) than with those of other peers in both phases (peer-evaluation). On the other hand, that the teacher's evaluations are the lowest in Phase 1 points to the fact that she is the only expert judge in the classroom and that for the students this is the first experimental practice they perform with musicians and with public, They have not had enough criteria and references to evaluate in a more adjusted way the performance of each item of the OCGCS scale. However, in Phase 2, students are more aware of the gestures to be evaluated, and self-observation has allowed them to have a more accurate portrait of their behavior on the podium.

According to Jenkinson and Fotopoulou (2010), the practices of self-observation lead the student to realize that they do not perceive their gestures when they conduct in the same way that they are seen from outside. As a result, participants' self-assessments have been much more critical. However, the expert judge – the teacher – has witnessed the improvement of the gestures of each student compared to the starting point, especially in those aspects that seemed unthinkable that could improve in such a short time (one week). This would explain that she has delivered better scores than the students themselves, who have gone from being unaware of what they did to overreaching self-criticism in general. These results coincide with the studies carried out by some researchers warning about the danger of students' tendency to hypercritical when self-observing (Hermida, 2013). Masats and Dooly also warn us of this tendency: "It is important to help students avoid focusing solely on the things they have done wrong" (2011, p. 1156).

All the gestural variables analyzed have experienced an improvement between the two phases mediated by self-observation through the video. Self-observation allows the student to become aware of gestural details that would go unnoticed if not viewed externally. Through self-observation the student becomes aware of his/her external image on the podium and this self-awareness can serve as a mechanism for reflection and change; also allows students to assume an active role in their own formation by being involved in the learning process as the main actors, putting in place a self-regulatory dimension that can provide them with autonomy in the preparation of conducting practical performances.

The design employed has made possible to carry out participative and reflexive practices of all the students of the collective, promoting the collaborative work and the interaction inside the community of apprentices. The OCGCS scale designed for this research has proved to be a valuable didactic tool not only for self-assessment, but also as a personal work guide for observations and as an evaluation resource for the teacher. Women in this study are more self-critical than men when evaluating (self and peer-evaluation). Finally, it should be noted that self-assessments reveal a more critical attitude than peer-evaluations.

In spite of the controls established to try to ensure that conclusions are as rigorous as possible, there are aspects that limit the scope of the results that have been obtained and which, consequently, should be taken into account in future research. The sample should be of probabilistic and random type and, if available, the results and conclusions would gain in robustness and representativeness.

Also, it would be interesting to study the relationship that may exist between the previous instrumental formation, previous ideas or preconceptions, motivation, self-concept or leadership with the learning of gesture in Orchestra Conducting. Given that the analysis presented in this work is exclusively quantitative, it would be advisable to complete it from a qualitative perspective.

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