

## Article

# Musical Instrumental Self-Concept, Social Support, and Grounded Optimism in Secondary School Students: Psycho-Pedagogical Implications for Music Education

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**Abstract:** Research in music education has shown that musical and academic self-concept, the social component, task achievement, and academic performance are highly interrelated constructs in musical learning in general and instrumental learning in particular in secondary school students. However, no studies in Spain have analyzed the relationship between musical self-concept and the variables of social support and optimism in compulsory secondary education. Therefore, our study aimed to explore the relationships between instrumental musical self-concept, social support, and grounded optimism. We hypothesize that there is a significant relationship between the variables of musical self-concept, social support, and grounded optimism. The variables were measured using the Instrumental Musical Self-Concept Scale (IMSCS), an adaptation of the Perceived Social Support Scale in Spanish Conservatory Music Students to the Secondary School Level, and the Grounded Optimism Scale (BEEGC-RA/BEECESA-RA24). The study sample consisted of 980 students enrolled in compulsory secondary education in public and semi-private schools in the autonomous communities of Aragon and Navarra. An analysis of correlations and regressions allowed us to explore and quantify the relationship among the variables under study, confirming the existence of a significant relationship among the variables “instrumental musical self-concept”, “social support” and “grounded optimism”. The present study thus provides more in-depth knowledge of the variables involved in the teaching–learning process of music as a school subject and instrumental music in particular, as well as a greater knowledge of the individual’s performance and motivation in the subject, with various future implications to be taken into account.

**Keywords:** music education; secondary education; instrumental training; musical self-concept; social support; grounded optimism; quantitative research; psychological constructs



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## 1. Introduction

Musical self-concept was taken into consideration as an integrative factor of general self-concept for the first time in the 1990s in the work of Walter P. Vispoel [1]. In his research, Vispoel introduced a construct clearly established on a conceptual and empirical basis, consisting of aspects belonging to several different musical areas. He also noted that musical self-concept is involved in motivation, attributions, and the achievement of musical goals [1]. This led to an increased interest in the study of musical self-concept in educational research, not only regarding the aspects that make up the construct, but also regarding its impact on further constructs and variables.

As research advances in this area, Ruismaki and Tereska [2] have probably proven to be the most relevant authors (along with Vispoel) in the study of musical self-concept. Using the theories of Shavelson, Hubner and Stanton [3] as their point of departure, they have substantiated the multidimensionality of musical self-concept, which is made up of the

subject's experiences in musical and non-musical situations. According to their experiments and findings, musical self-concept is composed of six basic dimensions: general musical self-concept, music conducting, musical taste, playing, singing, and listening to music.

In contrast with Vispoel [4], they have shown that musical self-concept is hierarchically subsumed under academic self-concept, which, in turn, forms part of general self-concept. They also found that the experience of having sung in early childhood and having played music in a family context are two determining variables in the formation of an individual's musical self-concept. Furthermore, they found that the educational context within which the individual plays an instrument, as well as the social and/or family context, play a determinant role in forming an individual's musical self-concept [2].

Based on the above-mentioned studies, on the definition of self-concept postulated by Vispoel [1] and on the definition of musical self-concept stated by Ruismaki and Tereska [2], we define musical instrumental self-concept as an individual's perception of their degree of musical competence and how they fulfill their role as a musician who plays a musical instrument.

In short, educational research on the subject of musical self-concept has shown that this construct, on the one hand, is hierarchically framed within academic self-concept, and the latter, in turn, within general self-concept; on the other hand, it is formed on the basis of educational, social and family contexts [2]. Without focusing on the construct of musical self-concept per se, further studies have shown how musical training exerts a positive effect on academic self-concept [5,6], on personal and social self-concept [6], and on motivation [7]. Several studies have shown that the practice of a musical instrument can contribute to the development of self-concept in adolescents, thereby improving their academic performance [5,8,9], their motivation, and their causal motivations [9–12].

Thus, with the goal of contributing to a satisfactory academic self-concept in adolescents and improving their academic performance, it would be of great interest to devote further study to musical self-concept and, more concretely, to musical instrumental self-concept.

Regarding the potential relationships between musical self-concept and several contextual variables, several authors have evidenced a relationship between musical self-concept and academic performance [13], motivation [14,15], and attributional styles [16].

Further studies have evidenced a relationship between self-concept and subjective well-being [17], self-concept and social support [18], academic performance and musical self-concept [2,6,13,19], academic performance and optimism [20–22], and between academic performance and social support [23,24].

To our knowledge, however, no previous study has analyzed the relationship between musical self-concept and the variables of social support and grounded optimism within the context of compulsory secondary education in Spain. Our study thus aims to analyze the concrete relationship between musical self-concept in music learning with further contextual variables, such as social support and grounded optimism.

Per the existing theory, we hypothesize that there is a significant relationship between the variables of musical self-concept, social support, and grounded optimism.

## 2. Materials and Methods

### 2.1. Participants

Our sample consisted of 980 students, 463 boys (47.2%) and 517 girls (52.8%), aged 12 to 18 ( $M = 13.887$ ,  $DT = 1.3425$ ) and enrolled in institutions of Compulsory Secondary Education (ESO) in the Autonomous Communities of Aragon (93.06%;  $n = 912$ ) and Navarra (6.93%;  $n = 68$ ).

Our selection criterion was the following: students taking the subject of music in secondary education when filling out the questionnaire. Based on the recommendations of Buendía, Colás and Hernández [25], regarding the selection of topics for research, we did not take students who had a cognitive disability into account.

We could count on the participation of fourteen learning institutions (two semi-private and twelve public high schools) in the communities of Aragon and Navarra. Among the

total, 89.89% of the sampled subjects came from public high schools ( $n = 881$ ), and 10.11% of them were enrolled in semi-private high schools (i.e., centros concertados:  $n = 99$ ).

In terms of academic level, 39.4% of the sampled students were in the academic year “1° de ESO” ( $n = 386$ ), equivalent to 7th grade in the United States; 1.1% of them were in “2° de ESO” ( $n = 11$ ), equivalent to 8th grade; 50.7% were in “3° de ESO” ( $n = 497$ ), equivalent to 9th grade; and 8.8% were in “4° de ESO” ( $n = 86$ ), equivalent to 10th grade. The students in 1°, 2°, and 3° were studying music as an obligatory subject, thus equal to 91.2% of the sample ( $n = 894$ ); on the other hand, the students in 4° were studying music as an optional subject, equivalent to 8.8% of the sample ( $n = 86$ ).

## 2.2. Measurement Variables and Tools

For this study, we elaborated and applied an additional questionnaire containing ten descriptors formulated as questions referring to socio-demographic, educational, and contextual variables, as well as age and sex.

To measure grounded optimism, we used the Escala de Autoconcepto Musical Instrumental (“Musical Instrumental Self-Concept Scale” [26]), which is the adaptation to secondary level of the Escala de Apoyo Social “Social Support Scale” [27], and BEECESA-RA, the “Revised and Updated Battery of Scales of Expectations and Control Specifically Applied to Academic Situations” (Batería de Escalas de Expectativas de Control Específicas de Situaciones Académicas Revisada y Actualizada, by David L. Palenzuela) (featured in [20]).

The “Musical Instrumental Self-Concept Scale”, developed by [26], is made up of 16 items on a seven-point Likert scale, wherein 1 = totally disagree (nothing) and 7 = totally agree (a lot). It measures self-perception in playing a musical instrument in the following dimensions: Music instrument competence (Items 1, 8, 9, 13, 15); Music instrument incompetence (Items 2, 5, 11, 14, 16); Social motivation and personal development (Items 4, 7, 10, 12), and Emotional factor (Items: 3, 6). The scale’s reliability index (Cronbach’s  $\alpha$ ) is high: the current sample yielded  $\alpha = 0.840$ .

The adaptation of the “Social Support Scale” [27] to the secondary education level consists of 31 items on a Likert-type scale featuring seven response alternatives, ranging from “1: Not a lot” to “7: A lot”. It evaluates the degree of support perceived to be received by secondary education students regarding their playing of an instrument in the school subject of music via a series of independent subscales for each of the social agents: parents (12 items), teachers (9 items), and peers (10 items). The peer factor, in turn, is subdivided into two subscales, the first of which is associated with the degree of perceived support regarding instrumental practice stemming from peers (Items 1–6 and 10), and the second of which is related to the degree of perceived support arising from peers, specifically in situations where the subject is teased and taunted about instrumental practice (Items 7–9). Each of the subscales and the overall scale obtain good reliability and validity indices as a tool measuring the social support perceived by Spanish secondary-level students who are training to learn an instrument (Cronbach’s  $\alpha = 0.858$ – $0.927$  for the current sample).

Conceived by David L. Palenzuela, the “Revised and Updated Battery of Scales of Expectations and Control Specifically Applied to Academic Situations” (BEECESA-RA) [20]—concretely, in our case, BEECESA-RA24—is a 24-item scale validated by [20] for application in educational contexts. It can be used for Spanish students either at secondary level, or involved in early professional training, or studying toward a Bachelor’s Degree. It consists, on the one hand, of four subscales designed to measure the four common expectations of control: contingency (Items 3, 7, 9, 22), self-efficacy (Items 2, 8, 11, 14), success (Items 4, 10, 20, 24), and the search for alternatives (Items 1, 13, 21, 23). On the other hand, it contains two subscales associated with an external locus of control: defenselessness (Items 6, 15, 17, 18) and luck (Items 5, 12, 16, 19). The Likert-type scale features nine alternative response levels ranging from “1: totally disagree” to “9: totally agree”. All subscales, as well as the scale on the whole, yielded good reliability and validity indices for measuring the constructs of grounded optimism and external locus of control in the

educational environment of Spanish secondary-level students (Cronbach's  $\alpha = 0.770\text{--}0.908$ ) with regard to the current sample.

### 3. Procedure and Analysis

Prior to data collection, we contacted the administration and the music teachers of the educational centers via e-mail, explaining the goals and nature of our study and proposing that they voluntarily take part in it. Once they had expressed their consent, we sent informed consent forms to the students and their parents, along with a letter explaining the study's goals and characteristics. Once the corresponding permissions had been obtained, the questionnaires were administered to the students under each center's supervision or by the music teachers themselves. Questionnaires were administered online via Google Docs; participation was thus anonymous and voluntary. The response time for the battery of questionnaires ranged from 20 to 30 min. Prior to data collection, we likewise requested and obtained the corresponding approval and authorization by the Committee of Research Ethics of the Autonomous Community of Aragon (CEICA).

To analyze the relationships among the psychological variables featured in our study design, we started by examining the relationship among the factors of each of the variables and the relationships among the variables themselves. Such an analysis allows the researcher to grasp how two variables vary simultaneously or in parallel. To achieve this, we used Pearson's correlation coefficient.

We then carried out multiple linear regression analysis (MLR), which attempts to explain the relationships between the criterion variable, in this case musical instrumental self-concept, and a series of explanatory or predictive variables. The latter comprise not only the socio-pedagogical variables included in the test design (sex, urban/rural distinction, weekly hours devoted to playing instruments, singing, body percussion and similar activities in the music assignment, instrumental practice outside of school hours, and musical training outside of school), but also the two psychological variables: grounded optimism and social support. By applying MLR and the stepwise method, we were able to consider independent variables individually, excluding those variables from the model that did not provide significant information for the criterion variable while only taking into account those variables that had a significant explanatory impact on it [28].

Data analysis was carried out following the instructions of Pardo and Ruiz [29], using the SPSS Statistical Package Version 25.0.

## 4. Results

### 4.1. Correlations

#### 4.1.1. Grounded Optimism

In our analysis (Table 1), we observed moderate positive correlations between the following factors: self-efficacy and contingency ( $r = 0.678, \rho < 0.01$ ), success and contingency ( $r = 0.635, \rho < 0.01$ ), alternatives and contingency ( $r = 0.711, \rho < 0.01$ ), success and self-efficacy ( $r = 0.791, \rho < 0.01$ ), alternatives and self-efficacy ( $r = 0.769, \rho < 0.01$ ), alternatives and success ( $r = 0.719, \rho < 0.01$ ), and luck and defenselessness ( $r = 0.635, \rho < 0.01$ ).

We also observed weak but significant positive correlations between the following factors: luck and self-efficacy ( $r = 0.080, \rho < 0.05$ ), external locus of control and self-efficacy ( $r = 0.073, \rho < 0.05$ ), luck and success ( $r = 0.125, \rho < 0.01$ ), external locus of control and alternatives ( $r = 0.155, \rho < 0.01$ ), external locus of control and luck ( $r = 0.124, \rho < 0.01$ ), and external locus of control and internal locus of control ( $r = 0.097, \rho < 0.01$ ).

Conversely, we observed strong positive significant correlations between the following factors: internal locus of control and contingency ( $r = 0.841, \rho < 0.01$ ), internal locus of control and self-efficacy ( $r = 0.916, \rho < 0.01$ ), internal locus of control and success ( $r = 0.898, \rho < 0.01$ ), internal locus of control and alternatives ( $r = 0.895, \rho < 0.01$ ), external locus of control and defenselessness ( $r = 0.907, \rho < 0.01$ ), and external locus of control and luck ( $r = 0.901, \rho < 0.01$ ).

**Table 1.** Grounded optimism correlations.

|                 | Contingency | Self-Efficacy | Success  | Alternatives | Defenselessness | Luck     | Int. Locus | Ext. Locus |
|-----------------|-------------|---------------|----------|--------------|-----------------|----------|------------|------------|
| Contingency     | 1           |               |          |              |                 |          |            |            |
| Self-efficacy   | 0.678 **    | 1             |          |              |                 |          |            |            |
| Success         | 0.635 **    | 0.791 **      | 1        |              |                 |          |            |            |
| Alternatives    | 0.711 **    | 0.769 **      | 0.719 ** | 1            |                 |          |            |            |
| Defenselessness | −0.013      | 0.053         | 0.040    | 0.106 **     | 1               |          |            |            |
| Luck            | 0.059       | 0.080 *       | 0.125 ** | 0.175 **     | 0.635 **        | 1        |            |            |
| Int. locus      | 0.841 **    | 0.916 **      | 0.898 ** | 0.895 **     | 0.052           | 0.124 ** | 1          |            |
| Ext. locus      | 0.025       | 0.073 *       | 0.091 ** | 0.155 **     | 0.907 **        | 0.901 ** | 0.097 **   | 1          |

\*\* The correlation is significant on the 0.01 level (2 tails). \* The correlation is significant on the 0.05 level (2 tails).

#### 4.1.2. Perceived Social Support

In our analysis of perceived social support (Table 2), we observed moderate positive correlations between the following factors: ‘social support’ sum factor and teachers ( $r = 0.721, \rho < 0.01$ ), peers2 and peers1 ( $r = 0.701, \rho < 0.01$ ), ‘social support’ sum factor and peers2 ( $r = 0.716, \rho < 0.01$ ), teachers and parents ( $r = 0.510, \rho < 0.01$ ), peers and parents ( $r = 0.672, \rho < 0.01$ ), peers1 and parents ( $r = 0.682, \rho < 0.01$ ), peers2 and parents ( $r = 0.522, \rho < 0.01$ ), peers and teachers ( $r = 0.437, \rho < 0.01$ ), peers1 and teachers ( $r = 0.430, \rho < 0.01$ ), and peers2 and teachers ( $r = 0.362, \rho < 0.01$ ).

**Table 2.** Social support correlations.

|                      | Parents  | Teachers | Peers    | Peers1   | Peers2   | Sum ‘Social Support’ |
|----------------------|----------|----------|----------|----------|----------|----------------------|
| Parents              | 1        |          |          |          |          |                      |
| Teachers             | 0.510 ** | 1        |          |          |          |                      |
| Peers                | 0.672 ** | 0.437 ** | 1        |          |          |                      |
| Peers1               | 0.682 ** | 0.430 ** | 0.961 ** | 1        |          |                      |
| Peers2               | 0.522 ** | 0.362 ** | 0.871 ** | 0.701 ** | 1        |                      |
| Sum ‘social support’ | 0.903 ** | 0.721 ** | 0.863 ** | 0.849 ** | 0.716 ** | 1                    |

\*\* The correlation is significant on the 0.01 level (2 tails).

Moreover, we observed strong positive significant correlations between the following factors: ‘social support’ sum factor and parents ( $r = 0.903, \rho < 0.01$ ), peers1 and peers ( $r = 0.961, \rho < 0.01$ ), peers2 and peers ( $r = 0.871, \rho < 0.01$ ), social support and peers ( $r = 0.863, \rho < 0.01$ ), and social support and peers1 ( $r = 0.849, \rho < 0.01$ ).

#### 4.1.3. Musical Instrumental Self-Concept

In our analysis of musical instrumental self-concept (Table 3), we observed moderate positive correlations between the following factors: social motivation/personal development and instrumental competency ( $r = 0.633, \rho < 0.01$ ), emotional factor and instrumental competency ( $r = 0.516, \rho < 0.01$ ), emotional factor and social motivation/personal development ( $r = 0.609, \rho < 0.01$ ), sum factor of the “Musical Instrumental Self-Concept” scale and social motivation/personal development ( $r = 0.788, \rho < 0.01$ ), and sum factor of the “Musical Instrumental Self-Concept” scale and the emotional factor ( $r = 0.685, \rho < 0.01$ ).

We also observed a moderate negative correlation between the sum factor of the scale “Musical Instrumental Self-Concept” and instrumental incompetence ( $r = -0.541, \rho < 0.01$ ), as well as weak negative correlations between the following factors: instrumental incompetence and instrumental competency ( $r = -0.269, \rho < 0.01$ ), social motivation/personal development and instrumental incompetence ( $r = -0.069, \rho < 0.05$ ), and emotional factor and instrumental incompetence ( $r = -0.081, \rho < 0.01$ ).

**Table 3.** Correlations in the area of musical instrumental self-concept.

|                           | Correlations        |                       |                               |                     |                             |
|---------------------------|---------------------|-----------------------|-------------------------------|---------------------|-----------------------------|
|                           | Instrum.<br>Compet. | Instrum.<br>Incompet. | Social Mot./<br>Personal Dev. | Emotional<br>Factor | Sum Factor<br>for the Scale |
| Instrumental Competence   | 1                   |                       |                               |                     |                             |
| Instrumental Incompetence | −0.269 **           | 1                     |                               |                     |                             |
| Social Mot./Personal Dev. | 0.633 **            | −0.069 *              | 1                             |                     |                             |
| Emotional factor          | 0.516 **            | −0.081 *              | 0.609 **                      | 1                   |                             |
| Sum factor for the scale  | 0.858 **            | −0.541 **             | 0.788 **                      | 0.685 **            | 1                           |

\*\* The correlation is significant on the 0.01 level (2 tails). \* The correlation is significant on the 0.05 level (2 tails).

We found a high positive correlation between the sum factor of the “Musical Instrumental Self-Concept” scale and instrumental competence ( $r = 0.858$ ,  $\rho < 0.01$ ).

#### 4.1.4. Correlations

Table 4 displays the correlations among all the psychological factors under study.

As could be expected and according to theory, the significant negative correlations of the musical incompetence factor with all the other factors are remarkable: not only with the variable of musical instrumental self-concept (featured above), but also with the variables “grounded optimism” and “perceived social support”.

We observed significant negative correlations between the factor of “musical instrumental incompetence” and the following factors: contingency ( $r = -0.102$ ,  $\rho < 0.01$ ), self-efficacy ( $r = -0.153$ ,  $\rho < 0.01$ ), success ( $r = -0.107$ ,  $\rho < 0.01$ ), alternatives ( $r = -0.093$ ,  $\rho < 0.01$ ), and internal locus of control ( $r = -0.129$ ,  $\rho < 0.01$ ). Moreover, we observed positive correlations between the same factor, i.e., “musical instrumental incompetence”, and the following factors: defenselessness ( $r = 0.176$ ,  $\rho < 0.01$ ), luck ( $r = 0.216$ ,  $\rho < 0.01$ ), and external locus of control of grounded optimism ( $r = 0.216$ ,  $\rho < 0.01$ ).

Regarding the “perceived social support” variable, we observe significant weak negative correlations between the “musical instrumental incompetence” factor and the following factors: parents ( $r = -0.103$ ,  $\rho < 0.01$ ), teachers ( $r = -0.107$ ,  $\rho < 0.01$ ), and the sum factor for the “perceived social support” scale ( $r = -0.094$ ,  $\rho < 0.01$ ).

Likewise, we observed significant positive correlations between the following factors: contingency, self-efficacy, success, alternatives, and the internal locus of control of grounded optimism, on the one hand, and the factors “musical instrumental competence”, “social motivation/personal development”, “emotional factor” and the sum factor corresponding to the “Musical Instrumental Self-Concept” scale, on the other. These correlations ranged from weak ( $r = 0.262$ ,  $\rho < 0.01$ ) to moderate ( $r = 0.517$ ,  $\rho < 0.01$ ).

We also observed significant weak positive correlations between the “luck” factor pertaining to grounded optimism and the “musical instrumental competence” factor ( $r = 0.084$ ,  $\rho < 0.01$ ), and between the same “luck” factor and “social motivation/personal development” pertaining to musical instrumental self-concept ( $r = 0.113$ ,  $\rho < 0.01$ ). Moreover, we noted significant weak positive correlations between the external locus of control of grounded optimism and musical instrumental competence ( $r = 0.063$ ,  $\rho < 0.05$ ), as well as between “external locus of control”, on the one hand, and “social motivation/personal development” pertaining to musical instrumental self-concept, on the other ( $r = 0.069$ ,  $\rho < 0.05$ ).

Table 4. Correlations among psychological variables.

|            | Correlations |                |                 |           |                 |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
|------------|--------------|----------------|-----------------|-----------|-----------------|-------------|---------------|----------|--------------|-----------------|----------|-------------------|---------------------------|----------|----------|----------|----------|----------|----------------|
|            | Instr. Comp. | Instr. Incomp. | Social M & P. D | Emotional | Sum facT M.I SC | Contingency | Self-Efficacy | Success  | Alternatives | Defenselessness | Luck     | Internal Locus c. | External Locus of Control | Parents  | Teachers | Peers    | Peers1   | Peers2   | Sum Social Sup |
| Instr. Co. | 1            |                |                 |           |                 |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Inst. Inc. | −0.269 **    | 1              |                 |           |                 |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| SM and PD  | 0.633 **     | −0.069 *       | 1               |           |                 |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Emotio     | 0.516 **     | −0.081 *       | 0.609 **        | 1         |                 |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Su MISC    | 0.858 **     | −0.541 **      | 0.788 **        | 0.685 **  | 1               |             |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Conting    | 0.430 **     | −0.102 **      | 0.310 **        | 0.262 **  | 0.386 **        | 1           |               |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Self-effic | 0.488 **     | −0.153 **      | 0.316 **        | 0.302 **  | 0.440 **        | 0.678 **    | 1             |          |              |                 |          |                   |                           |          |          |          |          |          |                |
| Success    | 0.415 **     | −0.107 **      | 0.293 **        | 0.262 **  | 0.376 **        | 0.635 **    | 0.791 **      | 1        |              |                 |          |                   |                           |          |          |          |          |          |                |
| Alternat.  | 0.510 **     | −0.093 **      | 0.397 **        | 0.343 **  | 0.465 **        | 0.711 **    | 0.769 **      | 0.719 ** | 1            |                 |          |                   |                           |          |          |          |          |          |                |
| Defensel.  | 0.031        | 0.176 **       | 0.013           | −0.026    | −0.057          | −0.013      | 0.053         | 0.040    | 0.106 **     | 1               |          |                   |                           |          |          |          |          |          |                |
| Luck       | 0.084 **     | 0.216 **       | 0.113 **        | 0.058     | 0.005           | 0.059       | 0.080 *       | 0.125 ** | 0.175 **     | 0.635 **        | 1        |                   |                           |          |          |          |          |          |                |
| IL Contr   | 0.517 **     | −0.129 **      | 0.368 **        | 0.328 **  | 0.467 **        | 0.841 **    | 0.916 **      | 0.898 ** | 0.895 **     | 0.052           | 0.124 ** | 1                 |                           |          |          |          |          |          |                |
| EL Contr   | 0.063 *      | 0.216 **       | 0.069 *         | 0.017     | −0.029          | 0.025       | 0.073 *       | 0.091 ** | 0.155 **     | 0.907 **        | 0.901 ** | 0.097 **          | 1                         |          |          |          |          |          |                |
| Parents    | 0.599 **     | −0.103 **      | 0.721 **        | 0.470 **  | 0.653 **        | 0.339 **    | 0.367 **      | 0.324 ** | 0.411 **     | −0.005          | 0.098 ** | 0.404 **          | 0.051                     | 1        |          |          |          |          |                |
| Teachers   | 0.518 **     | −0.107 **      | 0.507 **        | 0.516 **  | 0.553 **        | 0.446 **    | 0.483 **      | 0.445 ** | 0.487 **     | −0.042          | 0.067 *  | 0.523 **          | 0.013                     | 0.510 ** | 1        |          |          |          |                |
| Peers      | 0.469 **     | −0.033         | 0.560 **        | 0.407 **  | 0.500 **        | 0.250 **    | 0.321 **      | 0.281 ** | 0.367 **     | 0.079 *         | 0.173 ** | 0.342 **          | 0.138 **                  | 0.672 ** | 0.437 ** | 1        |          |          |                |
| Peers1     | 0.467 **     | −.030          | 0.563 **        | 0.396 **  | 0.497 **        | 0.203 **    | 0.303 **      | 0.268 ** | 0.337 **     | 0.101 **        | 0.199 ** | 0.313 **          | 0.165 **                  | 0.682 ** | 0.430 ** | 0.961 ** | 1        |          |                |
| Peers2     | 0.381 **     | −0.032         | 0.444 **        | 0.346 **  | 0.407 **        | 0.283 **    | 0.289 **      | 0.248 ** | 0.348 **     | 0.024           | 0.091 ** | 0.326 **          | 0.063 *                   | 0.522 ** | 0.362 ** | 0.871 ** | 0.701 ** | 1        |                |
| So. Su. Su | 0.632 **     | −0.094 **      | 0.725 **        | 0.545 **  | 0.681 **        | 0.397 **    | 0.451 **      | 0.403 ** | 0.492 **     | 0.017           | 0.138 ** | 0.489 **          | 0.085 **                  | 0.903 ** | 0.721 ** | 0.863 ** | 0.849 ** | 0.716 ** | 1              |

\*\* The correlation is significant on the 0.01 level (2 tails). \* The correlation is significant on the 0.05 level (2 tails).

We also observed significant positive correlations between the factors “parents”, “teachers”, “peers”, “peers1”, “peers2”, and the sum factor corresponding with the “Perceived Social Support” scale, on the one hand, and the following factors on the other: “musical instrumental competence”, “social motivation/personal development”, “emotional factor”, and the sum factor corresponding to the “Musical instrumental self-concept” scale. These correlations ranged from weak ( $r = 0.346$ ,  $\rho < 0.01$ ) to moderate ( $r = 0.725$ ,  $\rho < 0.01$ ).

Significant weak positive correlations (ranging from  $r = 0.203$ ,  $\rho < 0.01$  to  $r = 0.492$ ,  $\rho < 0.01$ ) were observed between the factors “contingency”, “self-efficacy”, “success”, “alternatives”, and the “internal locus of control of grounded optimism” on the one hand, and, on the other hand, the factors “parents”, “teachers”, “peers”, “peers1” and “peers2”, all pertaining to the “Perceived Social Support” scale.

We particularly wish to point out the significant weak positive correlations between the “defenselessness” factor (pertaining to grounded optimism) and the factors “peers” and “peers1”, pertaining to social support ( $r = 0.079$ ,  $\rho < 0.05$  and  $r = 0.101$ ,  $\rho < 0.01$ , respectively). Further remarkable correlations (significant positive) could be observed between the “luck” factor pertaining to grounded optimism and each one of the factors of social support, with values ranging from  $r = 0.098$  ( $\rho < 0.01$ ) to  $r = 0.199$  ( $\rho < 0.01$ ).

Another notable case can be seen in the significant weak positive correlations between the external locus factor of grounded optimism, on the one hand, and the factors “peers”, “peers1”, “peers2”, and the sum factor of the social support scale, on the other, with values ranging from  $r = 0.063$  ( $\rho < 0.05$ ) to  $r = 0.165$  ( $\rho < 0.01$ ).

#### 4.2. Regressions

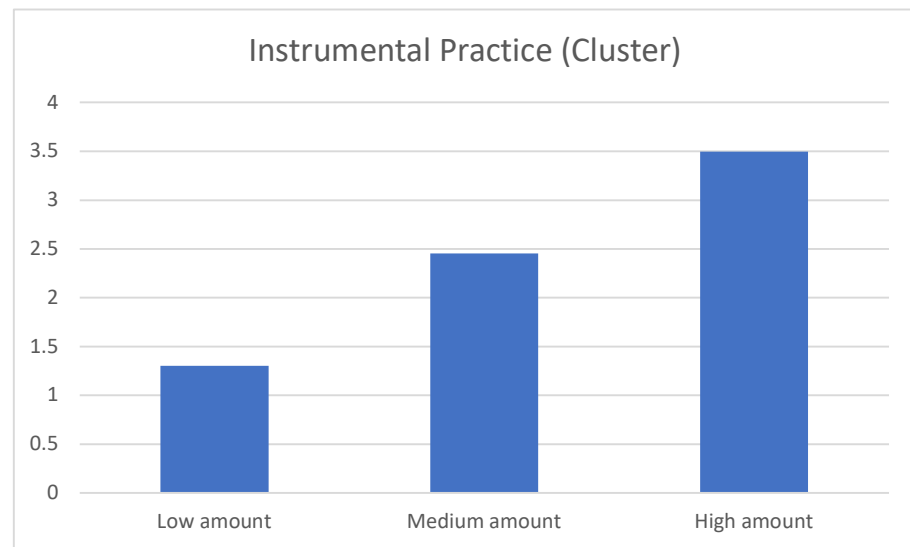
Multiple regression analysis offered us a tool to explore and quantify the relationship between the criterion variable (in our case, musical instrumental self-concept) and the explanatory socio-demographic, pedagogical, and psychological variables described above.

Thus, given the correlations we observed among psychological variables (grounded optimism, social support, and musical instrumental self-concept), we conducted a stepwise regression analysis to determine which variables are most prominent in the construct of musical instrumental self-concept.

Having reached this point, we deemed it appropriate to carry out a cluster analysis that would group the pedagogical variables featured in the current study that were directly implied in the practice of a musical instrument (i.e., instrumental practice outside school hours, receiving musical training outside of school, and the number of hours devoted to instrumental practice in the school subject of music). We produced a k-means cluster that allowed us to group the sample population into subpopulations that were clearly differentiated ( $F = 1374.285$ ,  $p = 0.000$ ). This cluster grouped the students into low amount of practice ( $M = 1.304$ ,  $n = 746$ ), medium amount of practice ( $M = 2.454$ ,  $n = 99$ ), and high amount of practice ( $M = 3.496$ ,  $n = 135$ ), as can be observed in Figure 1.

To achieve a more parsimonious explanation of the construct in accordance with the theoretical framework presented above, we grouped the factors associated with psychological variables in the following manner: all social support factors were grouped into one factor. Moreover, in accordance with the nature of the construct, we grouped grounded optimism into “external locus of control” and “internal locus of control”.

As can be observed in Table 5, the final approximation model ( $F = 226.536$ ,  $\rho = 0.000$ ;  $DW = 1.873$ ) explains 53.5% of the variance observed in the students’ responses.



**Figure 1.** K-means cluster: amount of instrumental practice.

**Table 5.** Linear regression models of musical instrumental self-concept.

| Model |                        | Standardized Coefficients | t.     | Sig.  | F.      | Corrected R-Squared |
|-------|------------------------|---------------------------|--------|-------|---------|---------------------|
| 1     | Sex                    | 0.177                     | 5.636  | 0.000 | 31.761  | 0.030               |
| 2     | Sex                    | 0.176                     | 5.619  | 0.000 | 19.231  | 0.036               |
|       | Urban/rural            | 0.080                     | 2.554  | 0.011 |         |                     |
| 3     | Sex                    | 0.135                     | 4.904  | 0.000 | 120.034 | 0.267               |
|       | Urban/rural            | 0.056                     | 2.051  | 0.041 |         |                     |
|       | Inst. practice cluster | 0.484                     | 17.592 | 0.000 |         |                     |
| 4     | Sex                    | 0.134                     | 5.421  | 0.000 | 169.887 | 0.408               |
|       | Urban/rural            | 0.032                     | 1.294  | 0.196 |         |                     |
|       | Inst. practice cluster | 0.411                     | 16.355 | 0.000 |         |                     |
|       | Internal locus         | 0.384                     | 15.285 | 0.000 |         |                     |
| 5     | Sex                    | 0.072                     | 3.232  | 0.001 | 226.536 | 0.535               |
|       | Urban/rural            | 0.013                     | 0.574  | 0.566 |         |                     |
|       | Inst. practice cluster | 0.239                     | 9.711  | 0.000 |         |                     |
|       | Internal locus         | 0.194                     | 7.723  | 0.000 |         |                     |
|       | Social support         | 0.461                     | 16.353 | 0.000 |         |                     |

In the first model, we incorporated the sex variable, which exerts a significant influence ( $t = 5.636$ ,  $p = 0.000$ ;  $\beta = 0.177$ ; corrected  $R^2 = 0.030$ ;  $F = 31.761$ ,  $p = 0.000$ ).

In the second model, additionally to sex, ( $t = 5.619$ ;  $p = 0.000$ ;  $\beta = 0.176$ ), we incorporated the “urban/rural” variable, which has a significant influence ( $t = 2.554$ ,  $p = 0.000$ ;  $\beta = 0.080$ ; corrected  $R^2 = 0.036$ ;  $F = 19.231$ ,  $p = 0.000$ ).

Apart from sex ( $t = 4.904$ ,  $p = 0.000$ ;  $\beta = 0.135$ ) and “urban/rural” ( $t = 2.051$ ,  $p = 0.041$ ;  $\beta = 0.056$ ), in the third model we incorporated the grouped variables associated with instrumental practice: their presence likewise had a significant effect ( $t = 17.592$ ,  $p = 0.000$ ;  $\beta = 0.484$ ; corrected  $R^2 = 0.267$ ;  $F = 120.034$ ,  $p = 0.000$ ).

In the fourth model, all the previously mentioned variables were present: sex ( $t = 5.421$ ,  $p = 0.000$ ;  $\beta = 0.134$ ) and instrumental practice ( $t = 16.355$ ,  $p = 0.000$ ;  $\beta = 0.411$ ) both exerted a significant effect, and the now added internal locus of control likewise played a significant role in this model ( $t = 15.285$ ,  $p = 0.000$ ;  $\beta = 0.384$ ). However, in this fourth model, the “urban/rural” variable no longer had a significant effect ( $t = 1.294$ ,  $p = 0.196$ ;  $\beta = 0.032$ ; corrected  $R^2 = 0.408$ ;  $F = 169.887$ ,  $p = 0.000$ ).

Finally, in the fifth model, the following variables continued to exert a significant influence: sex ( $t = 3.232$ ,  $p = 0.001$ ;  $\beta = 0.072$ ), instrumental practice ( $t = 9.711$ ,  $p = 0.000$ ;  $\beta = 0.239$ ), internal locus of control ( $t = 7.723$ ,  $p = 0.001$ ;  $\beta = 0.194$ ), and social support ( $t = 16.353$ ,  $p = 0.000$ ;  $\beta = 0.461$ ). As in the previous model, the “urban/rural” variable no longer exerted any significant influence ( $t = 0.574$ ,  $p = 0.566$ ;  $\beta = 0.013$ ; *corrected*  $R^2 = 0.535$ ;  $F = 226.536$ ,  $p = 0.000$ ).

## 5. Discussion and Conclusions

Our study’s goal was to analyze the relationship between musical instrumental self-concept and a series of socio-pedagogical variables, namely sex, urban/rural population, and instrumental practice, as well as the relationship with the two following psychological variables: grounded optimism, on the one hand, and perceived social support for instrumental training on the other. The effect of these socio-pedagogical and psychological variables upon a subject’s musical instrumental self-concept provides evidence regarding the variables involved in instrumental learning and the way secondary-level students form their self-concept as players of a musical instrument.

In accordance with previous theory on the subject [2], the results from our correlational analysis of the sample confirmed the existence of a significant relationship between the factors of socio-familiar support, emotional support, and musical instrumental self-concept. In accordance with the findings of Granada, Cortijo and Alemany [13], we were able to confirm a significant relationship among the factors of instrumental competence, instrumental incompetence, and musical instrumental self-concept. By studying correlations among all these variables, we found negative but weak correlations between them and the factor of musical instrumental incompetence, and weak to moderate positive correlations between those factors and perceived social support, thereby confirming the findings of Cuartero [27]. We also found weak negative correlations between the factor of incompetence and the following factors of grounded optimism: alternatives, internal locus, contingency, success, and self-efficacy. We found weak to moderate positive correlations among the remaining factors of musical instrumental self-concept and the factors associated with grounded optimism, self-efficacy and success with contingency, aligning with the findings of Granada, Cortijo and Alemany [13] or Royo [20]. Although the relationship among these constructs had not been previously investigated, our results are in line with those of Zubeldia, Goñi, Díaz y Goñi [30], who observed significant correlations between the causal attributions of success and musical self-concept: those correlations were positive in the internal attributions (ability, effort) and negative in the external attributions (difficulty of the task; luck), as well as in attributions of failure.

Our regression analysis confirms that musical instrumental self-concept is significantly impacted by the following variables: sex (higher in women than men), instrumental practice (higher for people with higher levels of instrumental practice). It is also directly related to the internal locus of control (as part of grounded optimism) and social support. In this sense, we have assumed a linear regression study, as established by the most academic approaches. However, based on the results obtained, future logistic regression analysis and therefore not necessarily linear regressions can also be considered to provide more information on the relationships that these variables have with each other.

We thus find that our stated hypothesis, based on previous research, is confirmed: a significant relationship exists among the variables of musical instrumental self-concept, social support, and grounded optimism. We also confirm the impact of the two socio-pedagogical variables, “sex” and “instrumental practice”, on musical instrumental self-concept. However, this does not apply to the “population” variable, which reflects the “urban/rural” distinction.

Regarding the sex variable, recent studies of musical self-concept with samples in Spain, such as those conducted by Zubeldia, Díaz and Goñi [16], Blanco [14], and Blanco, Domínguez and Pino [15], found significant differences in the factors of musical self-concept as a function of sex.

Regarding instrumental practice, previous studies have found that musical instrumental self-concept [2], namely academic self-concept [5,6,8], are influenced by instrumental practice, either in music as a school subject or in music as an extracurricular activity. Our results confirm those tendencies. They point out the importance of instrumental training for students (inside or outside of school) as a means of helping them build their self-concept.

Regarding perceived social support as a psychological variable, our results show that the impact of social agents—whether they be parents, teachers, or peers—is considerable on an individual's construction of their musical instrumental self-concept. These findings confirm previous studies on the relationships between self-concept and social support [18]. Consequently, we recommend that teachers create an atmosphere of support and motivation for instrumental practice within the secondary-level classroom. Work in groups and mutual support among students should be encouraged to develop a healthy climate that is beneficial for the achievement of common instrumental goals. Families should likewise be involved in students' instrumental training, thereby multiplying the benefits and value of such training on a psychological level and in terms of academic performance.

No previous Spanish studies have investigated the relationship between musical instrumental self-concept and the “grounded optimism” variable. In the educational field overall, significant relationships have been observed between grounded optimism and academic performance [20,22], while others have shown that social support and grounded optimism are variables that predict stress [31]. Our study's results point to the need to encourage proactive measures designed to help students overcome obstacles, search for alternatives, develop positive expectations, and improve their self-efficacy in instrumental practice at a secondary level.

To conclude, our results show significant relationships among the variables “grounded optimism”, “perceived social support in instrumental training”, and “instrumental self-concept”. Multiple regression analysis allowed us to quantify the relationship between the criterion variable (musical instrumental self-concept) and the explanatory variables, thereby revealing the impact of psychological variables as well as the variables “sex” and “instrumental practice” on a student's musical instrumental self-concept.

Our study has certain inherent limitations. Its orientation was exclusively quantitative, thus preventing a consideration of teachers' potential perspectives on the subject. Neither did we conduct an exhaustive analysis of teachers' educational practice in the school subject of music. The current study was restricted to two Spanish autonomous communities, Aragon and Navarra, with their respective study plans. It would have been pertinent to include further pedagogical variables. All these limitations should inspire future expanded research along these same lines.

Our results should encourage reflection regarding the teacher's role in the school subject of music in high school. Teachers should be well aware of the psycho-pedagogical variables involved in the teaching–learning process, particularly in the area of music education. It does not suffice to merely transmit knowledge while obviating the significant impact exerted by these variables; students will not be able to acquire knowledge and skills or improve their academic performance if these variables are not taken into account. Teachers should encourage socio-familiar involvement by creating situations where instrumental practice and music learning are supported and accompanied. Pre-service secondary education trainees should be taught to transmit psycho-pedagogical strategies that help their adolescent students develop a healthy self-concept and a satisfactory degree of optimism while remaining confident that they can count on socio-familiar support. All these factors should be considered in designing adequate, well-adapted pre-service teacher training curricula at a university level.

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