



## **Mediation of the physical education in the relationship with age and prosocial behaviors on primary school during Intergenerational Service-Learning**

### **Mediación de la Educación Física en la relación edad-prosocialidad en alumnado de educación primaria. Aprendizaje-Servicio intergeneracional**

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#### **Abstract**

The importance that Physical Education (PE) has on the learning competences of Primary School students requires special treatment, especially when talking about pro-social and citizenship behaviors. The objective of the present study has been to assess the influence of the PE on the relationship between age and prosocial competencies (Empathy, Respect, Sociability, and Leadership) among Primary School (PS) students during Physical Education (PE) classes and contents related to life cycle. The sample included 78 participants (girls=57.7%; boys=42.3%) in last courses of PS with two groups: traditional and Service-Learning (SL) methodology. The instruments used included a sociodemographic questionnaire designed ad hoc, a Physical Education Importance Questionnaire (PEIQ) by students, and another on Prosocial Behavior. The results obtained indicate a mediation between age and the prosocial competence of Respect, mediated by item 2 of the PEIQ ( $p<.05$ ;  $CI=-.230, -.005$ ; 60.6%) on students during SL methodology. In conclusion, the students' age in these grades allows them to discern what is important from what is not in terms of curriculum subjects, and the creation of a respect environment on the group too.

**Keywords:** civic competence; values; physical activity; methodology; life cycle

#### **Resumen**

La importancia que la Educación Física (EF) tiene sobre el aprendizaje competencial del alumnado de Educación Primaria (EP) requiere de un tratamiento especial, especialmente al hablar de conductas prosociales (CP) y ciudadanas. El objetivo del presente estudio ha sido evaluar la influencia que la EF tiene en la relación entre la edad y las CP (Empatía, Respeto, Sociabilidad y Liderazgo) de alumnado de EP durante clases de EF. La muestra comprendía a 78 participantes (chicas=57.7%; chicos=42.3%) de tercer ciclo de EP, organizados en dos grupos: metodología tradicional y otro una metodología ApS Intergeneracional. Los instrumentos usados fueron un cuestionario sociodemográfico diseñado ad hoc, un cuestionario de Importancia de la Educación Física (CIEF) atribuido al alumnado y otro sobre Comportamiento Prosocial. Los resultados obtenidos muestran una mediación entre la edad y la dimensión de Respeto, mediado por el ítem 2 del CIEF ( $p<.05$ ;  $IC=-.230, -.005$ ; 60.6%) en el alumnado participante en la metodología ApS. En conclusión, la edad del alumnado permite discernir lo que es importante de lo que no en cuanto a asignaturas del currículo se refiere, así como la creación de un clima de respeto en el grupo-clase a través de la metodología ApS.

**Palabras clave:** competencia ciudadana; valores; actividad física; metodología; ciclo vital.

Received: July 31, 2024

Accepted: December 8, 2024

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## Introduction

Modern education seeks not only to transmit knowledge but also to foster the holistic development of students. Active methodologies, such as Service-Learning (SL), have become a response to these needs, integrating academic learning with community service. Through SL, students not only acquire knowledge in the classroom but also apply it to real-life situations, addressing specific needs in their community (Martín-García et al., 2021). This methodology is particularly significant in Primary Education (PE), a key stage for developing academic skills and social and civic values. SL provides a unique framework to cultivate these aspects practically and relevantly (Calvo-Varela et al., 2019). Numerous studies and theories demonstrate the effectiveness of SL as a methodology that enhances the educational experience, emphasizing improved knowledge retention through practical application (Fuentes & Martínez, 2020; Miguel et al., 2019), in PE, Secondary Education, and Higher Education (Ruiz-Montero et al., 2022).

Physical Activity (PA) is a key component in enriching the educational experience. Through PA, students can develop empathy, respect, and cooperation. For this reason, SL proves especially relevant in Physical Education (PE) due to its practical and experiential nature. This area aligns with SL principles of "learning by doing" and contributing to the community, providing an ideal context for applying this educational methodology. In PE, SL goes beyond physical or health development, also promoting social and personal values through exercise and PA. SL projects allow participating students to apply what they learn in PE classes to real-life situations, acquiring valuable skills such as planning, implementing, and evaluating projects (Bastarrica et al., 2023; Pérez-Ordás et al., 2021). Teamwork is another essential component strengthened by SL in PE. SL projects often require students to collaborate toward common goals, fostering skills such as collaboration, effective communication, and leadership. These experiences are crucial not only for success in physical and sports activities but also for preparing students to work effectively in professional and personal contexts (Chiva-Bartoll et al., 2019). Additionally, SL in PE cultivates a positive attitude toward PA. By participating in projects with social impact, students can perceive the benefits of PA not only for themselves but also for their community (Franco-Sola et al., 2020; Pastor et al., 2022).

The interpretation and valuation of PE vary significantly with age, directly impacting the importance attributed to this area and its relationship with Prosocial Behaviors (PB). In the early years of PE, students primarily focus on play and fun, viewing PE as a time to explore and enjoy PA without a deep understanding of physical fitness or social and relational dynamics (Arufe-Giráldez, 2020). However, as they mature toward the end of PE, a shift in their focus and perception is observed. PE begins to be valued not only for its recreational component but also for its role in developing social and emotional skills, such as cooperation and respect for others (Founaud-Cabeza & González-Audicana, 2020). This transition to a deeper understanding of PE reflects a parallel development in social and emotional skills. Nearing puberty, there is greater engagement in PA not just for the pleasure of play but also as a way to relate to others, learn teamwork, and develop leadership and cooperation skills (Cáceres Zúñiga et al., 2018). In this sense, PE becomes a vehicle for fostering PB, such as cooperation, mutual help, and respect for others, essential skills for students' holistic development.

Intergenerational collaboration in the SL context plays a crucial role in challenging stereotypes associated with aging. By learning more about older adults, students can overcome preconceptions and develop a more nuanced and realistic understanding of aging (Martínez-Heredia & Rodríguez-García, 2018). A better understanding of older adults by students has proven to be an area of great impact and benefit for both groups (Gualano et al., 2018). SL projects facilitate valuable intergenerational exchanges, where students and older adults share knowledge, skills, and experiences, enriching both generations (de Juan Fernández, 2023; Simionato et al., 2023). Examples of interventions with older adults and university and non-university students can be found in previous studies by Ruiz-Montero et al. (2019), Ruiz-Montero et al. (2024), and Aláez et al. (2022). A notable benefit of these projects is the development of empathy in the participating students. By learning more about older adults, younger participants gain a deeper understanding of the experiences and challenges faced by this group, leading

to greater sensitivity to their needs. This mutual understanding is essential for fostering a more inclusive and compassionate society (Bert et al., 2018).

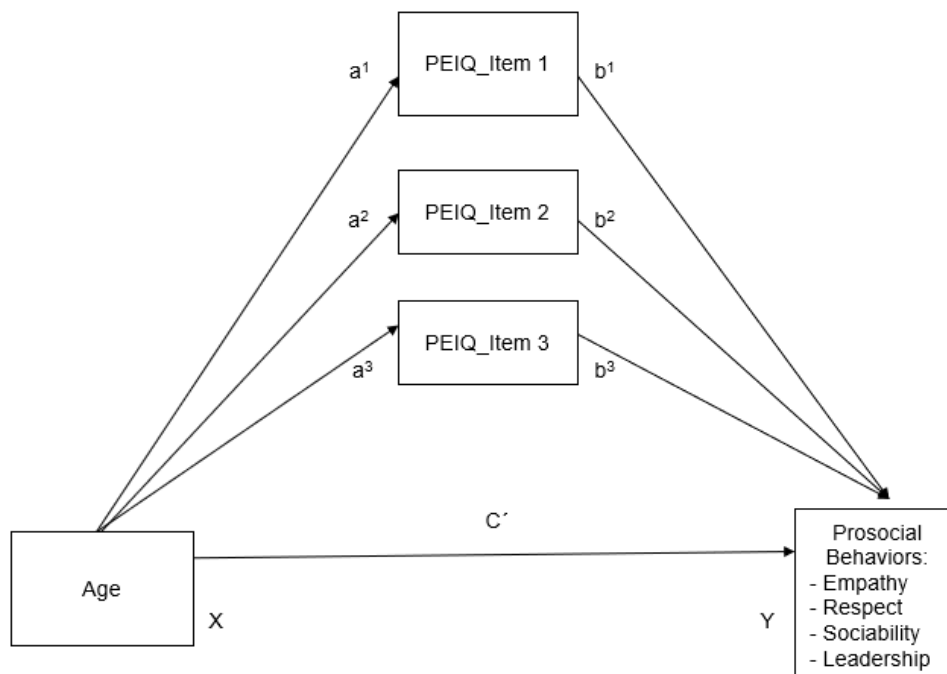
A greater sense of civic awareness and an increase in civic values are related to the importance students attribute to PE (Chiva-Bartoll et al., 2020). In this regard, Moreno-Murcia et al. (2009) provide a detailed view of how students value PE and its importance in the educational context through the Physical Education Importance Questionnaire (PEIQ). Regarding the importance attributed to PE, PE students associate its importance with fulfilling autonomy, competence, and relatedness needs. This finding suggests that when students feel autonomous, competent, and connected in their PE classes, they tend to value this area more.

SL is established as an educational methodology that transcends academic learning, playing a crucial role in promoting PB and fostering values (Benito-Colio et al., 2023). According to Martorell-Pallás et al. (2011), PB—voluntary actions aimed at benefiting others—are fundamental during schooling for the emotional and social development of students. These behaviors include helping, cooperating, sharing, and adhering to social norms, which are intrinsically linked to developing skills such as empathy, respect, social relationships, and leadership. In the SL context, specifically through PE, students have unique opportunities to practice and develop these PB. This practical and experiential approach allows them to directly experience the impact of their actions on others and the community, which is essential for internalizing and valuing the importance of PB (Ruiz-Montero et al., 2022).

Based on the background described, the objective of this study is to assess the importance of Physical Education (PEIQ) in relation to age (X) ( $a_1$ ,  $a_2$ ,  $a_3$ ) and PB (Empathy, Respect, Sociability, and Leadership) (Y) ( $b_1$ ,  $b_2$ ,  $b_3$ ) among two groups of PE students during PE classes, where one follows a traditional methodology and the other an Intergenerational SL methodology (Figure 1).

**Figure 1**

*Hypothetical model showing how Age (X) relates to PB (Y) (Empathy, Respect, Sociability, and Leadership) in the students involved in the study*



Note. In this model, there are different paths of influence:  $a$  = Indirect path between Age and each of the three PEIQ mediators;  $b$  = Indirect path between each of the three PEIQ mediators and each of the four dimensions of the PB questionnaire;  $C'$  = Direct path between Age and the four dimensions of the PB questionnaire. PB = Prosocial Behaviors. PEIQ = Physical Education Importance Questionnaire.

## Method

### Design

This research employs a quasi-experimental, cross-sectional design, focusing exclusively on the post-test phase of an intervention involving two groups. One group followed a traditional PE methodology, while the other engaged in an SL experience. The latter group functioned as a quasi-control group (Montero & León, 2007).

### Participants

The sample for this study consisted of 78 PE students (age =  $10.52 \pm .51$ ) from 5th and 6th grades attending PE classes at a school located in the province of Málaga. Among the participants, one group attended traditional PE classes within the school, while the other approached the subject through an SL methodology conducted outside the school. The decision to involve only students from the final stage of PE was due to the personal characteristics of the recipient group, which made it impractical to conduct SL experiences with younger students. All participating students lived in the same geographical area, close to the school and a day center for older adults where the SL experience took place.

Regarding the recipient group for the SL, it comprised dependent older adults who attended a day center daily, though it was not a full-time residential facility. This group had mild physical and cognitive limitations, allowing for direct interaction with the participating 5th and 6th-grade students. Finally, it should be noted that the older adults who received the SL experience were not evaluated in this study.

### Instruments

To gather information on the sociodemographic characteristics of the participating students, a specific questionnaire was implemented to collect data on: a) gender (male and female), b) methodology used (traditional and SL), c) the mean age and standard deviation of participants based on the methodology used in each group, d) items from the PEIQ, and e) items and dimensions from the PB questionnaire.

Additionally, other questionnaires were used, such as:

*Physical Education Importance Questionnaire (PEIQ)* (Moreno-Murcia et al., 2009). This questionnaire comprises three questions designed to evaluate the importance and usefulness of PE classes among students. The items in the questionnaire are: a) I consider it important to have PE classes, b) Compared to other subjects, I think PE is one of the most important, and c) I think the things I learn in PE will be useful in my life. Each item is scored on a Likert scale ranging from 1 "Strongly disagree" to 4 "Strongly agree." The questionnaire's reliability coefficient, with a value of .75, demonstrates adequate correlation.

*Prosocial Behaviors (PB)* (Martorell-Pallás et al., 2011). This questionnaire consists of 58 items grouped into four dimensions: Empathy (17 items), Respect (15 items), Sociability (15 items), and Leadership (10 items). Each item is rated on a Likert-type scale with four response options. The score for each of the four options ranges from 1 "Never" to 4 "Always." The target audience for this questionnaire is primarily school-age children and adolescents under 17 years old. Regarding psychometric properties, the four dimensions achieved good results in internal consistency, ranging from .76 to .87, which is significant (Martorell-Pallás et al., 1995), as well as in test-retest reliability (ranging from .65 to .71).

### Procedure

The study involved four classes: two 5th-grade groups (traditional methodology) and two 6th-grade groups (SL methodology). Families were provided with detailed information explaining the research process and were asked to sign explicit consent forms for their children's participation. Two teachers participated in this research: one was responsible for the group that worked with the traditional methodology in the school, and the other oversaw the group using the SL methodology at a day center for older adults. Both teachers had prior experience with SL methodology.

The SL experience was structured into three key phases: a) Contextualization and preparation of participating students through group dynamics, viewing previous experiences from other schools, and raising awareness about socially disadvantaged groups; b) Implementation of the SL sessions at a day center for older adults; and c) Administration of questionnaires to participating students at the conclusion of the experience. It is important to note that this study does not aim to evaluate or compare the effects of an SL intervention on the perception of PE or the PB of the participating students. The focus is exclusively on a mediation study conducted after completing an SL experience.

The content covered by both groups was similar, primarily focusing on the development of physical fitness (flexibility, upper and lower body strength, agility, and cardiorespiratory capacity). Activities were always supervised by healthcare personnel from the day center for older adults and the teachers involved in the SL experience. Regarding the SL group, sessions were held twice a week, lasting approximately 45–50 minutes each, over a period of 10 weeks. The activities for each session were designed by specialists in Physical Activity and Sports Sciences in the area of active aging. On the other hand, the group receiving the traditional methodology consisted of students from the same context and with similar characteristics to those in the SL experience group, but they continued with their regular PE classes within the school. After this period, the instruments described in the previous section were administered once.

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and was approved by the ethical committee (Ref. 3516/CEIH/2023), ensuring research accountability.

### Statistical Analysis

For the different sociodemographic variables obtained, central tendency measures were used, including the number of cases, percentages, means, and frequencies.

First, a Kolmogorov-Smirnov normality test was conducted to determine the normality of the analyzed sample, which was found to be non-parametric. A bivariate correlation analysis using Spearman's correlation test was performed to determine the associations between age, the three items comprising the PEIQ, and the four dimensions of the PB questionnaire, both in the group following the traditional methodology and the group using the SL methodology. According to the study by Mannerkorpi et al. (2006), in research related to PA, the most appropriate correlation values for the analyzed variables are interpreted as follows: weak or no relationship ( $r = 0$  to  $0.25$ ), moderate relationship ( $r = 0.25$  to  $0.50$ ), and moderate to good relationship ( $r = 0.50$  to  $0.75$ ).

To evaluate the relationship between the students' age and their PB (Empathy, Respect, Sociability, and Leadership), mediated by the three items evaluated by the PEIQ, a multiple mediation statistical analysis with bootstrap adjustment (Preacher & Hayes, 2008) was carried out for both the traditional methodology group and the SL group.

Bootstrap confidence interval (CI) analysis was conducted to determine the type of mediation used. If the upper and lower CI values contain zero (Preacher & Hayes, 2008), the result is deemed non-significant. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software, version 25.0, for social sciences (IBM SPSS for MAC, Armonk, NY).

## Results

Table 1 presents descriptive data (number of cases, percentage, mean, and standard deviation) of the sociodemographic variables, as well as the mean and standard deviation of the three items from the PEIQ and the four dimensions of PB for the students under study.

**Table 1**  
*Sociodemographic characteristics of the participants (n=78)*

| Sociodemographic Variable                                                              | Number of Cases (%) |
|----------------------------------------------------------------------------------------|---------------------|
| <b>Gender</b>                                                                          |                     |
| Female                                                                                 | 45 (57.7)           |
| Male                                                                                   | 33 (42.3)           |
| <b>Methodology used</b>                                                                |                     |
| Traditional                                                                            | 38 (48.7)           |
| Service-Learning                                                                       | 40 (51.3)           |
| <b>Age of participants</b>                                                             |                     |
| Traditional methodology group                                                          | Mean (SD)           |
| SL methodology group                                                                   | 10.11 (.31)         |
|                                                                                        | 10.92 (.26)         |
| <b>Item<math>\phi</math>/Dimension<math>\ddagger</math> of employed questionnaires</b> |                     |
| <b>Physical Education Importance (1-4)<math>\phi</math></b>                            |                     |
| 1. I consider it important to have PE classes                                          | 3.79 (.51)          |
| 2. Compared to other subjects, I think PE is one of the most important                 | 3.14 (.76)          |
| 3. I think the things I learn in PE will be useful in my life                          | 3.12 (.71)          |
| <b>Prosocial Behaviors (1-4)<math>\ddagger</math></b>                                  |                     |
| Empathy                                                                                | 3.15 (.42)          |
| Respect                                                                                | 2.96 (.31)          |
| Sociability                                                                            | 3.08 (.26)          |
| Leadership                                                                             | 3.02 (.45)          |

Before conducting mediation analyses, potential correlations were calculated between sociodemographic variables, such as age, the three PEIQ items, and the four PB dimensions, for both the traditional methodology group (Table 2) and the SL group (Table 3).

**Table 2**  
*Correlation established between Age, PEIQ, and PB for the group of students following a traditional methodology*

| Variables      | 1     | 2     | 3     | 4     | 5       | 6      | 7      |
|----------------|-------|-------|-------|-------|---------|--------|--------|
| 1. Age         |       |       |       |       |         |        |        |
| 2. PEIQ_Item 1 | .118  |       |       |       |         |        |        |
| 3. PEIQ_Item 2 | .004  | .139  |       |       |         |        |        |
| 4. PEIQ_Item 3 | -.093 | .067  | .345  |       |         |        |        |
| 5. Empathy     | .184  | -.019 | -.231 | .206  |         |        |        |
| 6. Respect     | .079  | .071  | -.197 | .406* | .757*** |        |        |
| 7. Sociability | .103  | -.252 | -.258 | .298  | .596*** | .458** |        |
| 8. Leadership  | .028  | -.118 | -.118 | .099  | .608*   | .391*  | .430** |

Note. PEIQ = Physical Education Importance Questionnaire; PB = Prosocial Behaviors; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



**Table 3***Correlation established between Age, PEIQ, and PB for the group of students following the SL methodology*

| Variables             | 1     | 2       | 3       | 4     | 5       | 6       | 7    |
|-----------------------|-------|---------|---------|-------|---------|---------|------|
| <b>1. Age</b>         |       |         |         |       |         |         |      |
| <b>2. PEIQ_Item 1</b> | -.114 |         |         |       |         |         |      |
| <b>3. PEIQ_Item 2</b> | -.260 | .097    |         |       |         |         |      |
| <b>4. PEIQ_Item 3</b> | .112  | .200    | .479*** |       |         |         |      |
| <b>5. Empathy</b>     | .308* | -.021   | -.021   | .092  |         |         |      |
| <b>6. Respect</b>     | .157  | -.078   | .260    | .136  | .620*** |         |      |
| <b>7. Sociability</b> | .128  | .032    | -.002   | -.170 | .553*** | .502*** |      |
| <b>8. Leadership</b>  | -.173 | -.400** | .129    | -.095 | .413**  | .366*   | .278 |

PEIQ = Physical Education Importance Questionnaire; PB = Prosocial Behaviors; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ 

Regarding the multiple mediation analysis, using an accelerated bootstrap method with bias correction and a 95% confidence interval (CI) (Preacher & Hayes, 2008), the path from the mediator (M) to the PB dimensions (Y) corresponding to item 3 of the PEIQ for students following a traditional methodology showed significance for Respect ( $p < 0.01$ ) and Sociability ( $p < 0.05$ ) (Table 4).

For students following the SL methodology, significance was also found in the path from the mediator (M) to the PB dimensions (Y), but this time for item 2 of the PEIQ regarding Respect and item 1 of the PEIQ regarding Leadership (both,  $p < 0.05$ ) (Table 5).

However, only the indirect effect of age on the Respect dimension of PB, through item 2 of the PEIQ as the mediator (M), was significant (point estimate = -0.082, 95% CI, lower = -0.023, upper = -0.01). The estimated mediation was 60.6% of the total effect of age on the Respect dimension of PB, mediated by item 2 of the PEIQ, for students following the SL methodology.

**Table 4***Indirect effect of age on PB of participating students, mediated by the PEIQ, in the group of students following a traditional methodology*

| Mediator    | Effect of X on M<br>(a1-a3) | SE   | Effect of M on Y<br>(b1-b3) | SE     | Bootstrap<br>Estimate | SE   | 95% CI |        |
|-------------|-----------------------------|------|-----------------------------|--------|-----------------------|------|--------|--------|
|             |                             |      |                             |        |                       |      | Lower  | Higher |
| Empathy     |                             |      |                             |        |                       |      |        |        |
| PEIQ_Item 1 | .147                        | .220 | -.124                       | .174   | -.018                 | .026 | -.085  | .023   |
| PEIQ_Item 2 | .073                        | .390 | -.151                       | .103   | -.011                 | .050 | -.158  | .059   |
| PEIQ_Item 3 | -.117                       | .347 | .219                        | .115   | -.025                 | .043 | -.162  | .015   |
| Respect     |                             |      |                             |        |                       |      |        |        |
| PEIQ_Item 1 | .147                        | .220 | -.021                       | .108   | -.003                 | .015 | -.044  | .021   |
| PEIQ_Item 2 | .073                        | .390 | .127                        | .063   | -.009                 | .039 | -.119  | .048   |
| PEIQ_Item 3 | -.117                       | .347 | .238                        | .071** | -.028                 | .035 | -.112  | .027   |
| Sociability |                             |      |                             |        |                       |      |        |        |
| PEIQ_Item 1 | .156                        | .226 | -.153                       | .099   | -.023                 | .018 | -.069  | .003   |
| PEIQ_Item 2 | .062                        | .381 | -0.97                       | .061   | -.006                 | .034 | -.106  | .045   |
| PEIQ_Item 3 | -.093                       | .348 | .137                        | .066*  | -.012                 | .026 | -.081  | .023   |
| Leadership  |                             |      |                             |        |                       |      |        |        |
| PEIQ_Item 1 | .147                        | .220 | .077                        | .159   | .011                  | .017 | -.019  | .051   |
| PEIQ_Item 2 | .073                        | .390 | -.093                       | .094   | -.006                 | .034 | -.125  | .037   |
| PEIQ_Item 3 | -.117                       | .347 | .106                        | .105   | -.012                 | .025 | -.107  | .012   |

Note. Based on a *bootstrap* sample with an accelerated method. X = Age; Y = Dimensions of the Prosocial Behavior Questionnaire (Empathy, Respect, Sociability, Leadership); M = Mediator; CI = Confidence Interval; SE = Standard Error; PEIQ = Physical Education Importance Questionnaire. If the CI contains zero, it is interpreted as non-significant. \* $p < 0.05$ ; \*\* $p < 0.01$ .



**Table 5***Indirect effect of age on PB of participating students, mediated by the PEIQ, in the group of students following the SL methodology*

| Mediator    | Effect of X on M<br>(a1-a3) | SE   | Effect of M on Y<br>(b1-b3) | SE    | Bootstrap<br>Estimate | SE   | 95% CI |        |
|-------------|-----------------------------|------|-----------------------------|-------|-----------------------|------|--------|--------|
|             |                             |      |                             |       |                       |      | Lower  | Higher |
| Empathy     |                             |      |                             |       |                       |      |        |        |
| PEIQ_Item 1 | -.199                       | .245 | .007                        | .106  | -.001                 | .021 | -.055  | .039   |
| PEIQ_Item 2 | -.543                       | .306 | .157                        | .095  | -.031                 | .055 | -.184  | .054   |
| PEIQ_Item 3 | .189                        | .301 | -.043                       | .102  | -.008                 | .049 | -.178  | .049   |
| Respect     |                             |      |                             |       |                       |      |        |        |
| PEIQ_Item 1 | -.199                       | .245 | .001                        | .083  | -.001                 | .019 | -.042  | .037   |
| PEIQ_Item 2 | -.543                       | .306 | .150                        | .075* | -.820                 | .056 | -.230  | -.005  |
| PEIQ_Item 3 | .189                        | .301 | .238                        | -.015 | -.002                 | .033 | -.122  | .041   |
| Sociability |                             |      |                             |       |                       |      |        |        |
| PEIQ_Item 1 | -.181                       | .262 | .091                        | .070  | -.023                 | .018 | -.016  | .025   |
| PEIQ_Item 2 | -.490                       | .327 | .059                        | .062  | -.006                 | .034 | -.028  | .036   |
| PEIQ_Item 3 | .332                        | .315 | -.118                       | .069  | -.012                 | .026 | -.039  | .051   |
| Leadership  |                             |      |                             |       |                       |      |        |        |
| PEIQ_Item 1 | -.199                       | .245 | -.288                       | .119* | .057                  | .052 | -.041  | .166   |
| PEIQ_Item 2 | -.543                       | .306 | .142                        | .107  | -.077                 | .085 | -.031  | .047   |
| PEIQ_Item 3 | .189                        | .301 | -.027                       | .115  | -.005                 | .041 | -.126  | .055   |

Based on a *bootstrap* sample with an accelerated method. X = Age; Y = Dimensions of the Prosocial Behavior Questionnaire (Empathy, Respect, Sociability, Leadership); M = Mediator; CI = Confidence Interval; SE = Standard Error; PEIQ = Physical Education Importance Questionnaire. If the CI contains zero, it is interpreted as non-significant. \* $p < 0.05$ , \*\* $p < 0.01$ .

## Discussion

The objective of this study was to assess the Physical Education Importance by analyzing the relationship between age and PB (Empathy, Respect, Sociability, and Leadership) among two groups of Primary Education students during PE classes, where one group followed a traditional methodology and the other an intergenerational SL methodology.

In general, students who followed the SL methodology may not have fully understood the dimensions of PB, except for Respect. This might explain the limited correlations and mediations established in this study. The Respect dimension did show significance in the overall mediation during the SL intervention, possibly explained by the focus on group activities in PE classes aimed at experiential education (Fernández et al., 2022; Whitley et al., 2017). Furthermore, the students involved in the SL methodology might have had an initial negative impression of older adults during the experience. Preconceived stereotypes about this group, often negative in the case of preadolescents and adolescents, could influence their perceptions (Aláez et al., 2022; Haugen et al., 2013). Another possibility is that students who participated in SL were dissatisfied because they were engaging with curricular content outside their regular learning environment, the school. A further explanation for the mediation path with Respect but not with other dimensions in the group following the traditional methodology could be that the curricular content addressed in this study focused solely on the cited dimension.

Nevertheless, the relationship between the importance of PE and various PB dimensions showed significance in Respect, Sociability, and Leadership, regardless of whether students followed a traditional methodology or SL. Therefore, the PE area should contribute to students' graduation profile at the end of basic education, using operational descriptors derived from key competencies. This approach fosters an alternative methodology that recognizes students as agents of their own learning (MEFP, 2022). In line with this, Paredes-Mejía et al. (2023) highlight the capacity of PE classes to promote respect and assertiveness among students, as well as physical activity in general. Respect fostered through inclusive PE committed to values-based education facilitates the social transformation of students in their final PE cycle. The development of competencies such as Respect, Sociability, or Leadership among PE students will establish the connection between these behaviors and effective intergenerational education (Hoyo-Guillot & Ruiz-Montero, 2023).

The age profile of preadolescent students allows for greater responsibility in leading and guiding activities or tasks, even acquiring responsibility within PE classes (Amado-Benítez, 2023; Baños et al., 2017). Consequently, students may perceive PE as a fundamental subject in their academic and personal lives due to the opportunities and experiences it provides. According to studies by Muñoz-González et al. (2019) and Mora et al. (2022) with schoolchildren in PE, students close to 12 years old showed very high levels of satisfaction and importance in PE classes, as well as positive intentions to engage in physical activity outside school hours (Calvo-Varela et al., 2019). Similar results were obtained in studies by Lamóneda (2018) and Tudela (2022) with third-cycle PE students using an SL intervention that promoted social relationships and respect through PE focused on recreation and animation.

Authors like Calvo-Varela et al. (2019) and Varela et al. (2023) indicate in a systematic review on SL with PE students that engagement increases during the second and third cycles of PE. As preadolescence ends and adolescence begins, there is greater motivation for SL, promoting greater social transfer among PE students. This enables the development of respectful and committed behaviors, such as the ability to lead activities while respecting others, mediate among peers, and propose learning situations that foster group assertiveness, ultimately improving the classroom climate.

During preadolescence in PE, students' behaviors during PE sessions are greatly influenced by their maturity level. Age significantly affects their involvement and motivation to explore new motor situations and become aware of PE's importance (Calvo-Varela et al., 2019; Martínez, 2019), particularly when Respect is emphasized, as SL methodology aims to foster through physical activity (Chiva-Bartoll et al., 2020). In line with this, the implementation of new methodological proposals in PE, like the SL intervention in this study, allows students to construct academic and personal knowledge with autonomy and respect for others based on their own learning and experiences (Negre-Bennasa et al., 2023; Redondo-Corcobado & Fuentes, 2020).

Zorrilla-Silvestre et al. (2019) highlight that socio-emotional competence is one of the cross-cutting contents developed in school PE when SL is implemented with socially disadvantaged groups. Motor games provide a source of stimuli and positive experiences that foster the development of physical and brain structures during interactions with others. This becomes even more significant when PE students participate in SL experiences, influencing their present and future. Therefore, it is essential to consider the use of different teaching methodologies as students progress through successive grades, ensuring greater engagement in PE learning situations while associating its importance with roles that develop leadership (Calvo-Varela et al., 2019; Vizcarra-Morales & Lleixá, 2022; Zorrilla-Silvestre et al., 2019). As students approach the end of preadolescence, they take on more responsibility for directing and guiding activities, tasks, exercises, games, and sports in PE classes, fostering a climate of group respect (Calvo-Varela et al., 2019; Guillén & Sandoval, 2022). Consequently, students may perceive PE as a fundamental subject in their academic and personal lives due to the opportunities it provides. Structured motor experiences allow for continuity in the achievements and progress made before transitioning to Secondary Education (ESO). This helps consolidate habits that persist throughout their lives, such as respecting norms, people, or diverse contexts. Another study with PE students examining personal satisfaction in connection with age showed that students close to 12 years old reported high levels of satisfaction, importance, and utility in the foundational knowledge proposed in different PE learning situations (Calvo-Varela et al., 2019; García-Vélez & Jiménez-Parra, 2022). This contributes to a positive classroom climate, a sense of group belonging, and good relationships with peers.

Several studies emphasize that PB—particularly Respect for others and Assertiveness—are significantly influenced among PE students who engage in SL methodology by the work done in PE classes with activities and games promoting cooperation and socialization (Maravé-Vivas et al., 2023). SL fosters respect for diverse opinions among students involved in any PE experience, especially during adolescence (Hoyo-Guillot & Ruiz-Montero, 2023; Huda et al., 2018). This supports the idea that the students in this study, who engaged in SL, demonstrate how PE plays a mediating role between preadolescent students and their acquisition of new behaviors toward others (Calvo-Varela et al., 2019).

According to Navarro-Patón et al. (2019), working on foundational knowledge through cooperative games and socialization activities can positively influence Empathy, Sociability, and Leadership among students during PE classes in PE, particularly in the final cycle (5th and 6th grades), significantly conditioned by age and maturity. Similarly, developing social skills during preadolescence makes the prosocial factor a fundamental component of students' personality development as they complete the PE stage (González et al., 2019). This underscores the importance of addressing various curricular blocks and foundational knowledge in the PE area. The development of personality aspects, such as prosocial behavior, in PE sessions is greatly influenced by the students' context and the level of responsibility they acquire during the transition from PE to ESO. This is further shaped by the maturity generated through social interaction and emotional education, fostering progressive reasoning in various activities, tasks, games, and sports as a manifestation of motor culture in PE.

The importance students attribute to PE in the final two years of PE is largely evidenced by their maturity and autonomy in managing different motor situations planned within the programming units through learning scenarios. Additionally, their physical self-concept and self-esteem allow them to lead PB when working with disadvantaged groups. The positive transfer from SL to the PE area must also be considered when experiences take place outside the educational context, for example, transitioning from physical activity and social sports to PE (Lista et al., 2023).

In conclusion, the results highlight the need to identify possible responsibility profiles in preadolescent students and their relationship with different prosocial variables (García et al., 2023), as well as with the perception of physical activity practiced. There is a clear need to promote values that improve the classroom environment and PB related to respect, helping students internalize all the values addressed in the curriculum. To achieve this, it is essential for students to take on different roles in PE classes as they complete the final cycle of primary education, thereby fostering extensive motor experimentation or increased motor engagement time.

Regarding the limitations of this study, evident limitations include: a) the lack of significantly stronger results in improving prosocial behaviors, beyond the improvements observed, particularly in the Respect dimension of prosocial behaviors; and b) the lack of research on the improvements

experienced by the recipient population of the service. These limitations highlight the need for future research that addresses: on one hand, a) the development of more similar studies with results that improve upon those presented here, and on the other hand, b) a parallel study providing relevant data on the improvements in the recipient population of the services conducted. Additionally, it is particularly important to emphasize the positive influence of age on students in the final cycle of primary education during SL experiences in PE, as reflected in the studies by Valdecabres & López (2024).

According to Eiguren et al. (2024), this study observed the impact of intergenerational experiences conducted within the context of formal education. In this setting, the methodology and meticulous selection of activities to be carried out form the essential foundation for implementing the experience with participating primary education students.

It is crucial to highlight the scarce implementation of intergenerational programs involving students in primary education, especially when they are responsible for conducting sessions exclusively related to curricular content. Studies that address mandatory education subjects, such as PE, through an SL experience within the framework of intergenerational education, are nearly non-existent.

Strengths and weaknesses are common processes necessary for understanding the educational reality and, based on it, designing strategies for transformation and improvement (Arnaiz et al., 2015). The most important strengths of this study stem from the support of responsible institutions and the students' experiences in providing services to older adults. Conversely, the most significant weaknesses include the limited implementation of intergenerational programs and the lack of research on the improvements experienced by the service recipient group.

**Funding:** This research was conducted as part of the R&D+i project "University Service-Learning in Physical Activity and Sport: An Opportunity for Social Inclusion," reference PID2019-105916RBI00, from the 2019 R&D+i Project Call. It is also supported by the 2022 FIDO Call (project no. 22-172), Quality, Teaching Innovation, and Prospective Unit, University of Granada, Spain. Additionally, this manuscript forms part of the first author's doctoral thesis and this part of the work carried out on the research stay of P.J.R.M. on University of Porto, Portugal (2023).

**Author Contributions:** Conceptualization, E.R.M., H.S.T., K.M.M.; methodology, E.R.M. and P.J.R.M.; validation, P.J.R.M.; analysis, P.J.R.M.; manuscript writing, E.R.M., H.S.T., K.M.M., and P.J.R.M.; writing, review, and editing, H.S.T., K.M.M., and E.R.M.; supervision, P.J.R.M. and K.M.M.

**Acknowledgments:** Special thanks to the administrative team of CEIP Valdelecrin (Fuengirola, Málaga, Spain) and the collaboration of the families.

**Conflict of Interest:** The authors declare no conflicts of interest.

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