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Educating gender equity through non-competitive cooperative motor games: Transforming stereotypes and socio-affective dynamics

Educar en la equidad de género a través de juegos motores cooperativos no competitivos: transformando estereotipos y dinámicas socioafectivas

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Abstract. Non-competitive cooperative motor games hold the potential to educate gender equity from a relational perspective. These motor games present educational relational challenges where different genders interact for mutual benefit. Such interactions generate emotional well-being, enhance socio-affective relationships, and promote feminized motor conducts that potentially perform gender hegemonies and reduce gender stereotypes. This study, grounded in the ethics of care and motor praxeology, explored the effects of non-competitive cooperative motor games on group and cross-gender socio-affective rejections, gender stereotypes and emotional well-being, along with the mediation effects of these interconnected variables. Researchers conducted a quasi-experimental study where 11 participants (M_{age} = 11.16; SD = 1.35) from a summer sports camp played non-competitive cooperative motor games. The study employed sociometric questionnaires, emotional questionnaires (PANAS-C) and gender stereotype questionnaires (NATGEN). Data were analyzed using inferential and descriptive statistical techniques, social network analysis and mediation analysis. Results revealed the effectiveness of non-competitive cooperative motor games in reducing cross-gender rejections among girls, maintaining low group rejections, promoting emotional well-being and reducing gender stereotypes. Mediation analysis showed that gender stereotypes and positive emotions act as a protective barrier against group rejection. This study presents an innovative educational perspective that combines the scientific foundations of motor praxeology with the theoretical bases of the ethics of care. The research provides teachers and researchers with a practical pedagogical tool based on non-competitive cooperative motor games. These games are designed to enhance gender equity, promote emotional well-being, and reduce gender-based rejection and stereotypes.
Keywords: sociometry, group cohesion, non-formal education, friendship, feminism, sport, inclusion, social acceptance

Resumen. Los juegos motores cooperativos no competitivos poseen el potencial de educar la equidad de género desde una perspectiva relacional. Estos juegos motores plantean retos relacionales educativos donde los diferentes géneros interactúan en beneficio mutuo. Dichas interacciones generan bienestar emocional, potencian las relaciones socioafectivas y promueven conductas motrices feminizadas que potencialmente performan las hegemonías de género y reducen los estereotipos de género. Este estudio, fundamentado en la ética de los cuidados y la praxeología motriz, exploró los efectos de los juegos motores cooperativos no competitivos sobre los rechazos socioafectivos grupales y entre géneros, los estereotipos de género y el bienestar emocional, junto con los efectos de mediación de estas variables interconectadas. Los investigadores llevaron a cabo un estudio cuasi-experimental en el que 11 participantes (M_{edad} = 11,16; ES = 1,35) de un campamento deportivo de verano jugaron a juegos motores cooperativos no competitivos. El estudio empleó cuestionarios sociométricos, cuestionarios emocionales (PANAS-C) y cuestionarios de estereotipos de género (NATGEN). Los datos se analizaron mediante técnicas estadísticas inferenciales y descriptivas, análisis de redes sociales y análisis de mediación. Los resultados revelaron la eficacia de los juegos motores cooperativos no competitivos para reducir los rechazos de las chicas a los chicos, mantener bajos los rechazos grupales, promover el bienestar emocional y reducir los estereotipos de género. El análisis de mediación mostró que los estereotipos de género y las emociones positivas actúan como una barrera protectora frente al rechazo grupal. Este estudio presenta una perspectiva educativa innovadora que combina los fundamentos científicos de la praxeología motriz con las bases teóricas de la ética del cuidado. La investigación proporciona a profesores e investigadores una herramienta pedagógica práctica basada en juegos motores cooperativos no competitivos. Estos juegos están diseñados para mejorar la equidad de género, promover el bienestar emocional y reducir el rechazo entre géneros y los estereotipos de género.
Palabras clave: sociometría, cohesión de grupo, educación no formal, amistad, feminismo, deporte, inclusión, aceptación social

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Introduction

Educate gender equity

Promoting gender equity stands as a paramount challenge in contemporary education. UNESCO (2022) advocates for developing social and moral capacities that transcend gender stereotypes through cooperative and supportive pedagogies. The ethics of care, a feminist relational ethics, is an ideal educational paradigm to educate gender equity (Camps, 2021; Noddings, 1984). This theory reconceptualizes people as interdependent relational beings who require care relationships, as their lives depend on their material, structural, and interpersonal connections (Busquets, 2018; Gilligan, 1982).

Fostering caring relationships promotes gender equity by enhancing opportunities and capacities to address gender needs, improve well-being and achieve valued goals (Camps, 2021; Sen, 1999). People care more about those with whom they have strong positive bonds. Therefore, enhancing socio-

affective relationships, which stem from emotional exchanges during interactions (Borgatti et al., 2009; Moreno, 1934), becomes crucial, especially minimizing negative relationships (Suldo et al., 2015).

Homophily favors relationships with those who are similar and rejects those who are different, increasing gender segregation (Block & Grund, 2014). This segregation reinforces gender stereotypes: Beliefs about the *correct way* to be a man or a woman based on hegemonic masculinity and femininity (Connell & Messerschmidt, 2005; Messerschmidt, 2018). Gender stereotypes define and limit how people of any gender are expected to behave, creating a normative framework that judges and sanctions those who do not comply, thus obstructing gender equity (Butler, 2009). The three main gender stereotypes are: physical differences, equal opportunities, and sexist beliefs and behaviors (March-Llanes et al., 2022).

Non-competitive cooperative motor games to educate gender equity

Non-competitive cooperative motor games (NCCMG) effectively address these educational challenges to promote gender equity. According to motor praxeology, the different rules of each motor game create a unique internal logic. Each internal logic generates diverse game situations that require students to relate in singular ways to other participants, space, objects, and time (Parlebas, 2001). The way each player experiences a game situation at relational, emotional, cognitive, and organic levels, based on their unique personality, corresponds to motor conduct (Lavega-Burgués et al., 2022a; Parlebas, 2001). Thus, from a motor conduct pedagogy perspective (Lavega, 2018), educators must choose motor games whose internal logic effectively favors the motor conducts that produce the desired procedural learnings. This approach ensures that students learn by performing unique motor conducts aligned with pedagogical objectives (Lavega-Burgués et al., 2022b; Luchoro-Parrilla, 2024).

The internal logic of NCCMG necessitates collaborative and interdependent motor conducts to achieve a common goal (Lavega, 2013; Suryadi et al., 2024; Zander et al., 2014), creating a feminized educational environment that supports the subversion of gender stereotypes and hegemonic gender constructions (Butler, 2009), which are often prevalent in sports contexts (Messerschmidt, 2018). Scientific literature shows that these feminized procedural learning contexts effectively educate gender equity by promoting cross-gender motor interactions while feeling well-being (Alcaraz-Muñoz et al., 2023; Niubò-Solé et al., 2022), enhancing socio-affective relationships (Andueza & Lavega, 2017; Grimminger-Seidensticker & Möhwald, 2020; Zander et al., 2014), and diminishing gender stereotypes (Sánchez-Hernández et al., 2018) by promoting feminized motor conducts (Lavega, 2013) that perform hegemonic masculinity and feminity (Butler, 2009).

Although the effectiveness of NCCMG in educating gender equity is well-documented, their effects on emotions, socio-affective relationships, and gender stereotypes have been studied separately. No investigation has evaluated the correlation of these metrics within non-competitive cooperative motor games. Moreover, from a relational educational perspective, previous studies have primarily focused on positive socio-affective relationships (Andueza & Lavega, 2013; Grimminger-Seidensticker & Möhwald, 2020; Zander et al., 2014), despite evidence that negative relationships have a greater impact on interpersonal dynamics (Suldo et al., 2015). Only Andueza & Lavega (2017) evaluated socio-affective rejections as well, finding inconclusive results about group and cross-gender rejections, although the overall social dynamic tended to improve.

García-López et al. (2012), Molina et al. (2020), and Casado-Robles et al. (2021) demonstrated that a Sports Education intervention based on cooperation-opposition motor games decreased group rejection levels. Only García-López et al. (2012) evaluated cross-gender rejections, showing improvement. Although these are not NCCMG, the Sports Education model, like NCCMG, promotes emotional well-being and interdependent motor conducts to achieve a common goal for each team (Lavega, 2013; Molina et al., 2020; Zander et al., 2014). Given the lack of evidence on the effect of NCCMG on group and cross-gender rejection, the positive effects observed in other types of motor games with shared characteristics highlight the need to investigate the effects of NCCMG on group and cross-gender rejection. However, cooperative-opposition games and the sports education model have traditionally been associated with hegemonic masculinity (Messerschmidt, 2018), which suggests that the feminized environment of NCCMG may be more effective in fostering gender equity.

The aim of this study was to explore the impact of non-competitive cooperative motor games on group and cross-gender socio-affective rejections, gender stereotypes, emotional well-being and the mediation of all these variables that are interconnected. Rooted on an ethics of care education and motor praxeology innovative paradigms, this research proposes practical educational interventions for investigators and educators to address the pressing challenge of gender equity.

Materials and methods

Design

Researchers conducted a quasi-experimental study with an experimental group. This study adopted a naturalistic approach, carried out under the typical conditions of a sports summer camp program.

Participants and procedure

The study involved 11 children (M_{age} = 11.16; SD = 1.35),

three boys and eight girls, from a sports summer camp. The composition of the group was determined by family preferences during the enrollment process. Over four days, the children engaged in 20 hours of non-competitive cooperative motor games.

The research adhered to the ethical requirements of the Declaration of Helsinki (World Medical Association, 2013), the standards of ethics in sports science (Harris et al., 2022) and the European Code of Conduct for Research Integrity (ALLEA, 2023). The clinical research committee of the General Secretary of Sports of Catalonia approved the study.

Intervention

Based on motor conduct pedagogy (Lavega, 2018), participants played 34 non-competitive cooperative motor games (NCCMG) in four sessions, each lasting between 10 and 45 minutes. The unique internal logic of each motor game promoted different educational challenges. To maximize the educational potential of these NCCMG, investigators meticulously selected motor games with varied internal logic traits related to space, time, material, and participants (Lavega, 2013; Lavega, 2018; Parlebas, 2001).

Regarding space, participants played motor games in both stable and unstable environments. For example, in *the body parts race game*, students were organized into groups of four and had to move from one point to another while maintaining contact between designated body parts (e.g., the left knee of one person with the right elbow of another). The nature of cooperation varied significantly: in a stable space, a basketball court, the task was straightforward, whereas while body rafting in a river, an unstable setting, the uncertainty introduced unforeseen educational challenges requiring cooperative problem-solving.

Regarding material, participants played NCCMG with and without materials. For instance, in *the birthday line game*, players stood on a line on the floor and were instructed to arrange themselves according to age without leaving the line. In a variation, they passed a ball to each other in order of their ages. The first version required cooperation with a lot of physical contact, presenting a different challenge than the ball-passing variation.

Regarding time, the NCCMG concluded upon reaching a set score, time limit, or objective. For example, in *the hoop passing game*, participants held hands in a circle. The instructor placed a hoop between the arms of two participants, and they had to pass the hoop around the circle without letting go of each other's hands. Another version added a time limit, creating greater tension. The time limit changed the way participants cooperated, as inefficient conducts could prevent the team from achieving its goal on time, potentially causing discomfort among teammates.

Finally, the relationships with other participants were structured around single and multiple roles. In single-role games, all players had identical rights and restrictions. In multiple-role games, different players had different responsibilities (Lavega-Burgués, 2023). For instance, in *the human knot game*, participants stood in a circle and held hands with two people that were not next to them. Without letting go of each other's hands, they must untangle the knot of arms by passing over or under the arms of other participants to form a circle again. When an "eyes closed" role was introduced, those participants had to be guided by those with "eyes open," creating different cooperative learning experiences.

Based on motor praxeology (Parlebas, 2001) and motor conduct pedagogy (Lavega, 2018), selecting different games with diverse internal logic traits created rich and multifaceted educational challenges to foster gender equity education. The selection of NCCMG fosters motor interactions to achieve a common goal, favoring an ethics of care education (Noddings, 1984).

Instruments

Sociometric questionnaire

Participants completed a sociometric questionnaire to assess socio-affective dynamics before and after the intervention. This questionnaire employed a peer nomination technique, allowing unlimited, directed, and weighted nominations, as outlined in the systematic review by Avramidis et al. (2017). In alignment with Parlebas (1992), participants were physically separated during the questionnaire to ensure privacy and were informed their responses would influence the grouping for a significant final activity. This activity was described as non-competitive and leisure-oriented, aimed at ensuring enjoyment and successful participation for all, thereby encouraging earnest and motivated responses. These methodological strategies are crucial to obtaining expressive networks rooted in socio-affective relationships (Mamas et al., 2023; Parlebas, 1992), avoiding responses guided by non-affective reasons. Given the critical role of negative socio-affective relationships in fostering inclusive responsive groups (Mamas & Trautman, 2024) and gender equity (Fabes et al., 2018), participants were asked: *With whom would you not like to share the final sports camp activity? Select the people you prefer not to be with so that you feel more comfortable during the activity. Please write the first and last names of the people with whom you least want to share the activity. We will take them into account in the order you list them.*

NATGEN questionnaire

To evaluate changes in gender stereotypes, participants completed the NATGEN questionnaire at the start and end of the intervention. The NATGEN questionnaire employed in the Erasmus+ international Opportunity Project (March-Llanes et al., 2022), comprises 15 items, which participants rate using a Likert scale from one to five. These items are then categorized into three factors reflecting different aspects of

gender stereotypes such as sexist beliefs and behaviors: cognitive and behavioral attitudes, physical differences between men and women: behavioral attitudes, and equal opportunities: cognitive and emotional attitudes.

PANAS-C questionnaire

Participants engaged with the PANAS-C emotional questionnaire in its 10-item version at the beginning and end of each session (Ebesutani et al., 2012; Sanmartín et al., 2018). This approach was utilized to evaluate the emotional experiences associated with each session, employing a Likert scale ranging from one to five. Participants were queried about the intensity of their emotions at the beginning of the session. At the end of the session, they were asked to reflect on the intensity of their emotional experiences throughout that session. This strategy allows for a nuanced understanding of the emotional dynamics the intervention engendered daily.

Off-Camp Interaction Recording Questionnaire

At the beginning of each session, every participant completed a questionnaire that tracked their interactions outside the summer camp, rating the quality of these relational experiences on a Likert scale from one to five, with one indicating a very negative experience and five signifying a very positive one. The only question was: *Among the members of your group, with whom did you spend time off campus yesterday? For example, playing games in the afternoon, going to the pool, eating together, etc. Please write their first and last names and rate from 1 to 5 how good or bad the time you spent with that person was, with 1 being very bad and 5 being very good. You can write more than one person if applicable.*

This daily assessment was designed to capture and evaluate the impact of uncontrolled interactions occurring outside the structured intervention, providing insights into how the sociometric results might be influenced by external social engagements (Avramidis et al., 2017; Parlebas, 1992).

Data analysis

A social network analysis was carried out using the UCINET version 6.770 software (Borgatti et al., 2002) to analyze the sociometric data and evaluate the socio-affective dynamics. Group, person and gender values were obtained. Subsequently, a principal components analysis was performed to determine the most relevant variables (Demšar et al., 2013).

Finally, the study utilized several key social network analysis variables (Borgatti et al., 2009) to measure different relationships patterns. The group E-I index was employed to assess the tendency of participants to reject persons of the same or different gender. This index contrasts the relative density of internal relationships (people with a similar trait) against external relationships (people with a different trait) (Block & Grund, 2014). Additionally, separate E-I indices for boys and girls measured the respective tendencies within these gender groups to emit same-gender or cross-gender rejections. Group rejection density was used to evaluate the overall frequency of rejections within the group. For mediation analysis, the study examined the influence of positive relationships on the number of rejections received, employing variables such as indegree elections (frequency of received elections), outdegree elections (frequency of emitted elections) and indegree rejections (frequency of received rejections).

Basic descriptors (mean and standard deviation) for gender (female, male) were applied. Shapiro-Wilk test was used to assess the normality of the data. One-way anova for nonparametric data were used, in order to reveal differences between gender and group. p-value and effect sizes (ES) through interval of >0.2 small, >0.5 moderate and >0.8 large were used to interpret the differences calculated according to recommendations (Cohen, 1988).

A mediation analysis was carried out (independent variables: positive emotion and elections made and received; mediators: sexist behaviors, sexist emotions and egalitarian attitudes; dependent: rejections received) (Hayes, 2013). Confidence intervals were calculated using the Standard (Delta method) and betas are fully standardized effect sizes. Through Mediation analysis, it is possible to detect mediating effects (Fritz & MacKinnon, 2007) with relatively a few participants. The analyses were performed using the statistical software Jasp.

Results

Interactions outside the intervention

The study revealed that interactions between participants outside the intervention were infrequent, accounting for only 6.970% of all potential interactions. These reduced interactions were predominantly positive, with an average rating of 4.783 (± .412).

Cross-gender group rejections: E-I Index

Participants exhibited a significant shift in its group cross-gender rejections (E-I index), moving from an initial mean value of .429 to -.167 post-intervention (p <.001), demonstrating a maximum effect size (ε^2 = 1.000). The expected E-I Index according to group composition was -.127.

The impact on the cross-gender rejection varied by gender. Girls displayed a significant transformation in their rejection patterns: initially, they were more inclined to reject boys (M = .250), but after the intervention, the trend shifted, with rejections more frequently directed towards other girls (M = -.474). Conversely, boys primarily rejected girls at the start (M = .667), and this pattern intensified post-intervention, with rejections aimed exclusively at girls (M = 1.000).

Group rejection density

The density of rejections remained constant (M = .136)

although the distribution of rejections changed from a male centered rejection distribution to a female centered distribution.

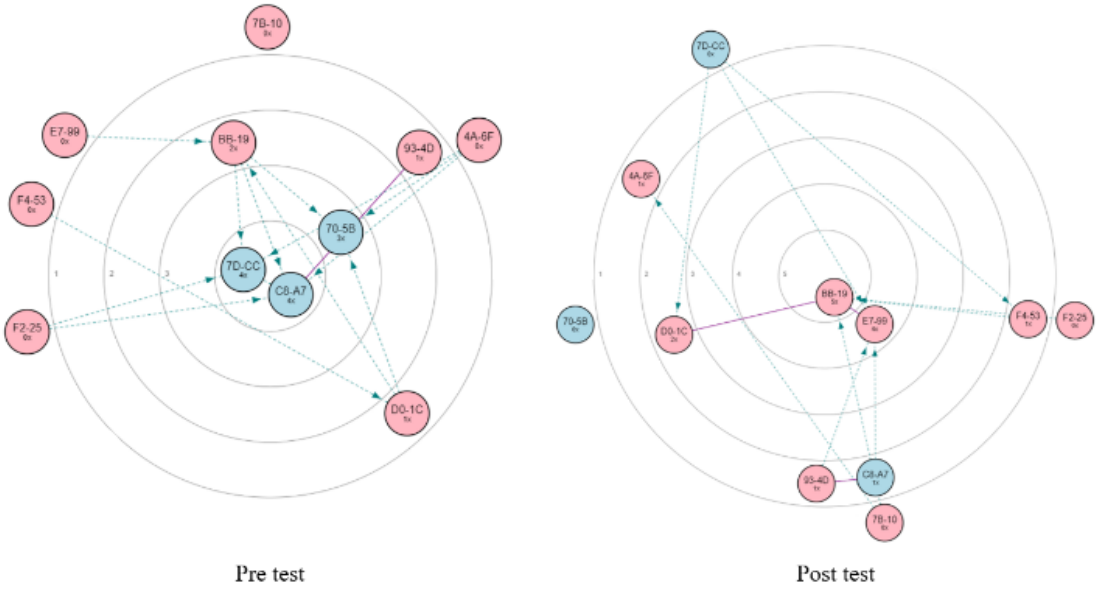

Figure 1. Sociogram of group rejections. Note. Green dashed arrows = unidirectional rejections; Purple solid lines = bidirectional rejections; blue circle = boys; red circle = girls. The frequency of rejections increases with the concentricity of the circle.

Gender stereotypes

Sexist beliefs and behaviors: cognitive and behavioral attitudes did not reveal significant changes ($p > .05$) from the pretest (10.091 ± 2.427) to the posttest (10.364 ± 2.292), with a minimal effect size ($\varepsilon^2 = .010$). Girls exhibited a marginally higher tendency (10.500 ± 2.633) than boys (9.500 ± .837), though the effect size of this gender comparison was also small ($\varepsilon^2 = .038$).

The physical differences between boys and girls: behavioral attitudes showed a trend to decrease from the pretest (9.545 ± 3.236) to the posttest (8.000 ± 3.347), with a small effect size ($\varepsilon^2 = .080$). Boys presented higher physical stereotypes (11.167 ± 4.119) than girls (7.875 ± 2.553), with the gender comparison showing a moderate effect size ($\varepsilon^2 = .147$).

Equality of opportunities: cognitive and emotional attitudes unveiled a slight downward trend from the pretest (14.273 ± 2.195) to the posttest (13.364 ± 2.461), and the effect size was small ($\varepsilon^2 = .062$). Boys scored slightly higher (14.333 ± 2.503) than girls (13.635 ± 2.306), but the effect size for this gender disparity was minimal ($\varepsilon^2 = .016$).

Table 1.
Group gender stereotypes

Variable	Pre (M±SD)	Post (M±SD)	x^2	df	p	ε^2
Sexist beliefs and behaviors: cognitive and behavioral attitudes	10.091 ± 2.427	10.364 ± 2.292	.202	1	.653	.010
Physical differences between men and women: behavioral attitudes	9.545 ± 3.236	8.000 ± 3.347	1.689	1	.194	.080
Equality of opportunities: cognitive and emotional attitudes	14.273 ± 2.195	13.364 ± 2.461	1.298	1	.255	.062

Table 2.
Gender differences in gender stereotypes

Variable	Boys (M±SD)	Girls (M±SD)	x^2	df	p	ε^2
Sexist beliefs and behaviors: cognitive and behavioral attitudes	9.500 ± .837	10.500 ± 2.633	.798	1	.372	.038
Physical differences between men and women: behavioral attitudes	11.167 ± 4.119	7.875 ± 2.553	3.090	1	.079	.147
Equality of opportunities: cognitive and emotional attitudes	14.333 ± 2.503	13.635 ± 2.306	.338	1	.561	.016

Emotional intensity

The findings indicate that participants experienced minimal levels of negative emotions at the beginning ($M = 1.027 \pm .052$) and conclusion of the session ($M = 1.035 \pm .048$), coupled with high levels of emotional well-being. Notably, emotional well-being showed an increase from $M = 4.214 \pm .640$

to $M = 4.630 \pm .367$ following the intervention.

Intermediation between socio-affective relationships, emotions and gender stereotypes

Table 3.
Mediation analysis between emotions, stereotypes and socio-affective relationships

				95% C.I. (a)				
Type	Effect	Estimate	SE	Lower	Upper	β	z	p
Indirect	P Emo ⇒ Ste 1 ⇒ Rec Rej	-.753	9.235	-18.854	17.347	-.016	-.081	.935
	P Emo ⇒ Ste 2 ⇒ Rec Rej	.462	1.255	-19.638	2.563	.010	.045	.964
	P Emo ⇒ Ste 3 ⇒ Rec Rej	11.748	16.536	-2.662	44.159	.256	.710	.477
	Rec Elec ⇒ Ste 1 ⇒ Rec Rej	-.431	.233	-.888	.025	-.407	-1.849	.064
	Rec Elec ⇒ Ste 2 ⇒ Rec Rej	-.116	.198	-.504	.272	-.109	-.587	.557
	Rec Elec ⇒ Ste 3 ⇒ Rec Rej	.042	.298	-.543	.627	.039	.139	.889
	Emi Elec⇒ Ste 1 ⇒ Rec Rej	-.651	.766	-2.153	.851	-.192	-.850	.395
	Emi Elec ⇒ Ste 2 ⇒ Rec Rej	-.413	.835	-2.050	1.223	-.122	-.495	.621
	Emi Elec ⇒ Ste 3 ⇒ Rec Rej	.804	1.296	-1.737	3.344	.236	.620	.535
Component	P Emo ⇒ Ste 1	.148	1.809	-3.397	3.693	.024	.082	.935
	Ste 1 ⇒ Rec Rej	-5.104	1.885	-8.799	-1.409	-.696	-2.707	.007
	P Emo ⇒ Ste 2	.162	3.578	-6.856	7.175	.018	.045	.964
	Ste 2 ⇒ Rec Rej	2.865	1.459	.006	5.725	.570	1.964	.050
	P Emo ⇒ Ste 3	-1.967	2.707	-7.272	3.338	-.294	-.727	.467
	Ste 3 ⇒ Rec Rej	-5.972	1.771	-9.443	-2.501	-.874	-3.372	< .001
	Rec Elec ⇒ Ste 1	.084	.033	.019	.150	.586	2.532	.011
	Rec Elec ⇒ Ste 2	-.041	.066	-.170	.089	-.193	-.616	.538
	Rec Elec ⇒ Ste 3	-.007	.050	-.105	.091	-.045	-.139	.889
	Emi Elec ⇒ Ste 1	.128	.143	-.152	.407	.275	.895	.371
	Emi Elec ⇒ Ste 2	-.144	.282	-.697	.409	-.213	-.512	.609
	Emi Elec ⇒ Ste 3	-.135	.213	-.553	.284	-.271	-.631	.528
Direct	P Emo ⇒ Rec Rej	-32.503	1.525	-53.131	-11.875	-.710	-3.088	.002
	Rec Elec ⇒ Rec Rej	.196	.262	-.318	.710	.185	.746	.456
	Emi Elec ⇒ Rec Rej	-.806	.841	-2.454	.842	-.237	-.959	.338
Total	P Emo ⇒ Rec Rej	-21.045	17.256	-54.867	12.777	-.460	-1.220	.223
	Rec Elec ⇒ Rec Rej	-.310	.318	-.934	.314	-.293	-.975	.329
	Emi Elec ⇒ Rec Rej	-1.067	1.360	-3.733	1.599	-.314	-.785	.433

Note. P Emo = Positive emotion; Rec Rej = Received rejections; Rec Elec = Received elections; Emi Elec = Emitted elections; Ste 1 = Stereotype 1: Sexist beliefs and behaviors: cognitive and behavioral attitudes; Ste 2 = Stereotype 2: Physical differences between men and women: behavioral attitudes; Ste 3 = Stereotype 3: Equal opportunity: cognitive and emotional attitudes.

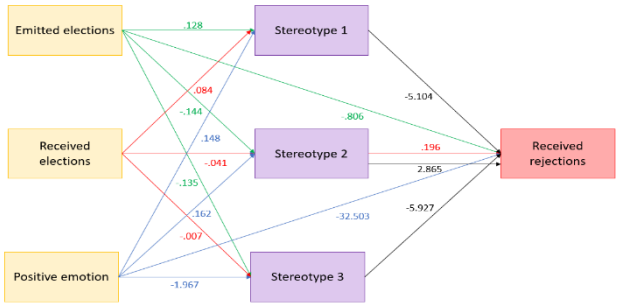

Figure 2. Mediation model: emotions, gender stereotypes and rejections received Note. Stereotype 1 = Sexist beliefs and behaviors: cognitive and behavioral attitudes; Stereotype 2 = Physical differences between men and women: behavioral attitudes; Stereotype 3 = Equal opportunity: cognitive and emotional attitudes.

The mediation analysis evaluated the direct and indirect effects of positive emotions, elections emitted and elections received on rejections received, mediated by three factors of gender stereotypes: sexist beliefs and behaviors: cognitive and behavioral attitudes (stereotype 1), physical differences between boys and girls: behavioral attitudes (stereotype 2), and equal opportunities: cognitive and emotional attitudes (stereotype 3). Mediation analysis was performed to assess the mediating role of stereotype 1, 2 and 3 on the linkage between independent variables (emitted elections, received elections and positive emotions) and dependent variable (received rejection). The results show direct effects of independent variable (Positive Emotions) on dependent variable, Received Rejections (β = -32.503, t = -.710, p =.020). With the inclusion of the mediation variable (stereotype 1, 2 and 3), the impact of independent variables on received rejections was found insignificant but with trends as Received Elections ⇒ Stereotype 1 ⇒ Received Rejections (β = -.431, t = -1.849, p > .064).

The indirect effect of independent variables (emitted elections, received elections and positive emotions) on received rejection through stereotype 1, 2 and 3 was still insignificant. The results revealed that the total effect of emitted elections (β = -1.067, t =-.785, p > .433), received elections (β = -.310, t =-.975, p > .329) and positive emotions (β = -21.045, t =-1.220, p > .223) on received rejection were insignificant.

Three significant component pathways were identified. The pathway from received elections to stereotype 1 (Rec Elec ⇒ Ste 1) was significant (β = .586, t = 2.532, p = .011), suggesting that received elections positively influence stereotype 1. The pathway from stereotype 1 to received rejection (Ste 1 ⇒ Rec Rej) was significant (β = -.696, t = -2.707, p =.007), indicating that higher levels of stereotype 1 were associated with lower levels of received rejection. The path from stereotype 3 to received rejection (Ste 3 ⇒ Rec Rej) was significant (β = -.874, t = -3.372, p <.001), indicating that higher levels of stereotype 3 were associated with lower levels of received rejection.

Discussion

This study investigated the effects of non-competitive cooperative motor games on group and cross-gender socio-affective rejections, gender stereotypes, and emotional well-being, alongside the mediation effects of these variables. Our findings significantly confirmed the efficacy of these games in reducing cross-gender rejections, particularly among girls, while maintaining low levels of groups rejections. A significant negative mediation effect indicated that positive emotions and elevated gender stereotypes were associated with fewer rejections received. Results indicated a trend toward promoting emotional well-being and reducing gender stereotypes. Limited positive interactions outside of summer camp support the intervention, demonstrating that external interactions minimally influenced outcomes.

Cross-gender Rejections

Non-competitive cooperative motor games (NCCMG) led to a more equitable distribution of rejections. These rejections shifted from focusing on other genders to ignoring gender attributes, promoting gender equity (Fabes et al., 2018). These results align with Zander et al. (2014), where expressive cooperative motor games, based on dance, improved reciprocal cross-gender collaboration choices among boys, enhancing inter-gender relationships. Similarly, Andueza & Lavega (2017) found that non-competitive cooperative motor games tended to reduce the number of marginalized students of both genders. Lastly, Grimminger-Seidensticker & Möhwald (2020) demonstrated that cooperative motor games improved group dynamics, although they did not analyze gender specifically, their findings reinforce the positive effect of NCCMG on socio-emotional dynamics.

While the aforementioned studies focused on the effects of cooperative motor games on elections, except for Andueza & Lavega (2017) who also evaluated rejection showing inconclusive results regarding group and gender-based rejections. This article is the first to demonstrate that NCCMG significantly improve cross-gender rejections. The effectiveness of these motor games lies in their internal logic, which fosters well-being interactions between genders to achieve a common and interdependent goal (Lavega, 2013; Zander et al., 2014). NCCMG become a practical, simple, and effective way for educators to teach gender equity.

The results showed that this improvement was mainly due to the change in the orientation of girl's rejections, who significantly reduced their homophilic rejections: the tendency to form negative relationships with people of similar characteristics, in this case, gender (Block & Grund, 2014). These findings are consistent with the investigation of García-López et al. (2012), where women were the gender that most modified their rejections, specifically decreasing them after an intervention of the Sports Education model applied to handball. Although this study is focused on competitive cooperative-opposition motor games, it evidences a greater rejection sensitivity among girls.

These gender-specific patterns may stem from a heightened sensitivity of girls to relational and emotional dimensions (Fischer et al., 2018), influenced by the social constructs of hegemonic femininity (Barton & Huebner, 2020). Alternatively, although boys shifted to rejecting only girls, they showed a tendency to reduce the number of rejections, aligning with the findings of García-López et al. (2012). By recognizing humans as relational beings predisposed to care for and care about those with whom they share a positive rapport, girls' improvement of cross-gender relationships and the reduction of boys' rejections enhances their ability to recognize and respond to the dependencies that affect people of other genders, promoting gender equity (Busquets, 2019; Noddings, 1984).

Group rejections and emotional well-being

NCCMG promoted motor interactions while feeling emotional well-being (Alcaraz-Muñoz et al., 2023; Niubò-Solé et al., 2022). Understanding socio-affective relationships as the result of emotional exchanges during interactions (Borgatti et al., 2009; Moreno, 1934), the prevalence of positive emotions created a less hostile and more equitable group environment (Fabes et al., 2018; Mamas & Trautman, 2024), maintaining low group rejection levels even though the orientation of rejections changed. It is important to note that the ceiling effect limited potential reductions in rejections due to their initially low levels (Wang et al., 2008).

This study is the first to link emotions and sociometry in

motor games interventions. However, evidence shows that motor games are contexts of emotional well-being (Alcaraz-Muñoz et al., 2023; Niubò-Solé et al., 2022), thus, when comparing our results, we assume that positive emotions predominated in other studies as well. In this sense, our findings are consistent with García-López et al. (2012), Molina et al. (2020), and Casado-Robles et al. (2021) that reduced group rejection levels. Although these studies used a Sports Education model based on competitive cooperative-opposition sports, they also represent contexts of motor interaction while feeling well-being. These authors selected Sport Education to enhance social interactions aimed at achieving a common, interdependent goal, a key feature of non-competitive cooperative motor games (Lavega, 2013; Zander et al., 2014). However, these contexts still reflect a setting of hegemonic masculinity, which is less effective at challenging stereotypes and disrupting dominant gender constructs to promote gender equality (Butler, 2009; Messerschmidt, 2018).

While the intervention successfully reduced cross-gender rejections, it did not significantly alter the levels of emotional well-being among participants ($M = 1.027 \pm .052$ to $M = 1.035 \pm .048$). This stability might suggest that the emotional benefits of non-competitive cooperative motor games are more nuanced and potentially overshadowed by other factors such as pre-existing group dynamics or external influences.

Andueza & Lavega (2017) showed inconclusive results regarding rejections after an intervention with NCCMG, but they also presented initially low levels of group rejection. Future studies with groups exhibiting higher initial levels of rejection could better evaluate the impact of NCCMG on reducing rejections.

These findings provide valuable insights into the emotional and social impacts of NCCMG, highlighting how the internal logic of these games influences educational outcomes. Motor games that require social interactions to achieve a common and interdependent goal are ideal educational contexts for improving group socio-affective relationships (Zander et al., 2014). Motor conducts pedagogy allows educators to understand the characteristics of motor games, helping them to select the most suitable ones for their objectives (Lavega, 2018).

Gender stereotypes

The intervention led to a noticeable tendency to reduce gender stereotypes, particularly those related to physical differences and equal opportunities between genders. The internal logic of non-competitive cooperative motor games fosters care-focused motor conducts traditionally associated with femininity (Lavega, 2013). When these care-based motor conducts are performed by individuals across gender spectra (Butler, 2009), they subvert traditional norms of hegemonic masculinity and femininity (Barton & Huebner, 2020; Connell & Messerschmidt, 2005, Messerschmidt, 2018), thereby promoting gender equity and reducing gender stereotypes.

The intervention showed a slight reduction in gender stereotypes, particularly in beliefs about physical differences and equal opportunities between genders. The minimal effect size ($\varepsilon^2 = .010$) indicates a minor shift, suggesting that while non-competitive cooperative motor games can influence gender stereotypes, the magnitude of this effect is limited. This finding aligns with previous research by Sánchez-Hernández et al. (2018), which also reported modest changes in sexist attitudes through cooperative learning methodologies. These results underscore the need for prolonged and multifaceted interventions to achieve significant changes in deeply ingrained gender stereotypes.

Gender stereotypes exhibited distinct patterns based on gender: boys scored higher on physical differences and equal opportunities between genders. In contrast, girls tended to score higher on sexist beliefs and behaviors. These results align with Pelegrín-Muñoz et al. (2012), who noted higher levels of boys' sexist attitudes towards girls related to physicality in motor contexts. Connell (2008) explains that the masculinized nature that usually prevails on physical-sports environments fosters hegemonic masculine identities, which in turn perpetuate boys gender stereotypes, particularly regarding physical differences between genders. This masculinized environment also plays a role in shaping forms of femininity, potentially reinforcing certain stereotypes among women about their own beliefs and behaviors (Barton & Huebner, 2020). Our study highlights the importance of challenging hegemonic masculinity in education to promote gender equity. NCCMG offer a traditionally feminized educational environment (Lavega, 2013) to transgress the hegemonic masculinity prevalent in physical-sports contexts (Messerschmidt, 2018).

Intermediation between socio-affective relationships, emotions and gender stereotypes

Positive emotions reduced the number of rejections received, confirming that socio-affective relationships are strongly related to the emotional experience while interacting with others (Borgatti et al., 2009; Moreno, 1934). Our findings demonstrate that educational environments where positive emotions predominate, such as non-competitive cooperative motor games, enhance socio-affective relationships (Alcaraz-Muñoz et al., 2023; Andueza & Lavega, 2017; Grimminger-Seidensticker & Möhwald, 2020; Niubò-Solé et al., 2022), promoting gender equity (Fabes et al., 2018).

Gender stereotypes amplified elections and served as a buffer against rejections. This suggests that aligning with societal gender norms improve personal socio-affective position. These results align with Barton & Huebner (2020), which asserts that many forms of femininity are despised, favoring hegemonic gender behaviors that reinforce gender stereotypes. In this context, non-competitive cooperative motor games foster feminized motor conducts (Lavega, 2013) that

men may prefer not to assume. Therefore, maintaining stereotypical behaviors in a feminized context could favor greater social acceptance (Hochschild & Machung, 2012).

These findings underscore the complex challenge inherent in confronting gender stereotypes. Deviating from hegemonic masculinity and femininity may lead to increased levels of rejection (Barton & Huebner, 2020; Messerschmidt, 2018). While subverting traditional gender stereotypes is crucial for promoting gender equity, it also exposes individuals to potential social risks associated with non-conformity (Butler, 2009). This paradox highlights the importance of fostering positive socio-affective group dynamics as a fundamental part of educational strategies that challenge gender stereotypes, thereby helping to prevent undesirable socio-affective situations.

NCCMG emerge as an ideal educational context to diminish gender stereotypes while enhancing socio-affective relationships. These motor games become an effective and practical educational tool for educators, fostering an inclusive and equitable environment.

Conclusion

Our investigation demonstrates the efficacy of non-competitive cooperative motor games in improving cross-gender socio-affective relationships, emotional well-being, and reducing gender stereotypes. These findings advocate for incorporating such games into educational curricula to foster an inclusive and equitable learning environment. Educators can utilize these games as a practical tool to promote gender equity, emphasizing relational and emotional competencies.

However, limitations such as the absence of a control group, small sample size, uneven gender distribution, and the specific setting of a summer sports camp suggest caution in generalizing the findings. Future research should explore longer-term interventions and incorporate qualitative measures to capture subtle changes in emotional well-being. Additionally, examining the role of individual differences in emotional resilience and baseline well-being could provide deeper insights.

Despite these limitations, this study is valuable as the sample size was sufficient to perform a mediation analysis, allowing us to evaluate for the first time the interconnection of emotional, socio-affective, and gender stereotype outcomes in non-competitive cooperative motor games. Moreover, this is the first study to find significant positive results regarding the effect of non-competitive cooperative motor games on social-affective rejections. Our innovative study could inspire future research to replicate these results in more diverse settings and with larger samples to confirm the effectiveness of non-competitive cooperative motor games in enhancing gender equity.

Our study makes a significant contribution to the fields of education and gender studies by presenting a concrete educational approach aimed at promoting gender equity. This research opens up a new relationally-centered field of educational inquiry and provides educators with practical strategies, to address the pressing societal challenge of gender equity. This article recommends the educational community to conduct interventions based on non-competitive cooperative motor games to increase emotional well-being, reduce cross-gender rejections and diminish gender stereotypes to educate gender equity.

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