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Research Notes

Relationships among motor competence, self-perceived competence and aggressive behavior differ between boys and girls aged 7 to 10: a network perspective

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HIGHLIGHTS

- Aggressive behavior differs between males and females
- Aggression is associated with motor competence in boys, but not in girls
- In girls, global self-worth is more influential than motor competence in the network
- Locomotion and perceived athletic competence are central nodes for boys

ABBREVIATIONS

GGM	Gaussian graphical model
LASSO	Least absolute shrinkage and selection operator
PAB-S	Peer aggression behavior scale
pcor	Partial correlation
TGMD-3	Test of gross motor development – 3° edition
λ	Tuning parameter

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BACKGROUND: Aggressiveness is a complex construct that can influence and be influenced by various factors during childhood. Behavioral aspects such as motor competence, along with psychosocial aspects such as self-perception of social acceptance and self-esteem, can affect aggressive behavior in boys and girls.
AIM: This study investigated the relationships between motor competence, self-perceived competence, and aggressive behavior in children aged 7 to 10 years, focusing on gender differences.
METHODS: We recruited a total of 87 children from economically disadvantaged and violence-prone areas in Juazeiro do Norte, Ceará, Brazil. Motor competence was assessed with the Test of Gross Motor Development, perception of competence was measured using the Self-Perception Profile for Children scale, and proactive and reactive aggressiveness was assessed with the Peer Aggression Behavior Scale. The differences between boys and girls were verified using Student's t-test. Network analysis was used to verify interactions between the variables investigated.
RESULTS: We identified that boys demonstrated positive correlation between aggression and specific motor skills, particularly locomotion skills, while we did not observe this relationship in girls. Centrality measures indicated that locomotion skills were pivotal in boys' networks, whereas global self-worth was more influential in girls. Social acceptance showed differential correlations with proactive and reactive aggression, suggesting nuanced behavioral dynamics.
INTERPRETATION: The findings highlight the necessity of gender-tailored interventions to enhance motor skills, self-perception, and social behaviors in children, contributing to a deeper understanding of developmental dynamics in early childhood. The study underscores the importance of considering sociocultural and gender-specific factors in addressing aggressive behavior and motor competence in children.

KEYWORDS: Motor skills | Self-concept | Aggression | Child behavior | Sex factors

INTRODUCTION

The scientific community has widely debated the relationship between the capability to perform motor skills (motor competence) and the child's self-perception of motor competence. Extensive research indicates that children with higher motor competence tend to have a higher perception of their abilities than those with lower levels of motor competence [1,2]. Research has highlighted the importance of these factors as predictors of lifelong physical activity engagement [3,4].

On the contrary, some studies with children in early childhood have not shown an association between motor competence and self-perception of motor competence [5,6]. A meta-analysis by De Meester et al. [7] demonstrated that the strength of associations between motor competence and self-perception of athletic/physical competence varies from low to moderate in this population. Even though age and gender have been suggested as potential influencing factors in the relationship between motor competence and self-perception of

motor competence in those children, De Meester et al. [7] did not show a difference in the strength of the associations considering these moderators. Some findings argue that differences in cognitive development [1,8] and a lack of opportunities for motor practice (that could help enhance children's perceptions) [5] may explain the weak associations between motor competence and self-perception of motor competence observed in children in the early years of schooling.

Evidence suggests that motor practice opportunities can influence other dimensions of development, such as self-perception of social acceptance [5,9]. The perception of social acceptance is essential in child development as it relates to children's emotional well-being and social adjustment [10]. In other words, positive peer relationships in the first school years are associated with higher social competence and acceptance in the later school years. Also, research indicates that children with lower peer acceptance tend to exhibit higher levels of aggression in their social interactions [11,12].

In this sense, aggressiveness is a complex construct that can influence and be influenced by peer rejection during childhood [13]. Children who overestimate their social acceptance level, or even their self-competence, are more likely to display aggressive behavior, as their perception eventually diverges from peer acceptance [14]. Some evidence supports that opportunities for motor practices may decrease aggressive behaviors in children [15]; however, these findings are still scarce and inconclusive [16,17].

From a dynamic systems perspective, motor competence and social behaviors are not fixed attributes of the individual; they emerge continuously from the interaction between individual, environmental, and task constraints [18]. In contexts of social vulnerability, this dynamic tends to become even more sensitive, since children may be simultaneously more exposed to stressors (such as community and family violence, insecurity, and daily emotional instability) [19] and have less access to structured and safe opportunities for motor practice (guided play, sports, appropriate spaces, adult mediation) [20,21]. In this scenario, motor competence and aggression can co-influence each other throughout development; thus, limitations in motor experiences can reduce social participation and self-regulation in play and interaction situations, while persistent patterns of aggression can restrict the child's integration into collective activities, further diminishing opportunities to develop motor competence.

Therefore, investigating the relationship between motor competence and aggression in childhood is relevant for understanding developmental trajectories in adverse environments and for supporting interventions that expand opportunities for movement, social interaction, and emotional regulation. Furthermore, it is crucial to consider gender differences, since boys and girls may experience different opportunities for motor practice, receive different social expectations regarding physical performance, and express aggression in different ways 22. These asymmetries can alter both the strength and direction of the associations between motor competence, self-perception, and aggression, justifying analyses stratified by gender.

We suppose that aggression can be associated with the perception of motor competence and actual motor competence in children. Given that these constructs have a complex relationship, they can affect and be affected by each other. Considering the intricate and nonlinear nature of motor behavior patterns [23], which are influenced by individual constraints, environment, and task 18, we used network analysis to consider the dynamic interaction among those constructs. Thus, we sought to investigate the relationships among performance in fundamental motor skills (motor competence), self-perceived competence, and aggressiveness in children aged 7 to 10. We also investigated whether the interaction between motor competence, self-perceived competence, and aggressiveness is different between boys and girls.

METHODS

Participants

In this cross-sectional study, we recruited 87 children aged 7 to 10 years (boys=52, M = 9.23+1.35, years, and girls=35, M = 9.14+ 1.28 years) in a public elementary school within of Juazeiro do Norte, Ceará, Brazil. The participants lived and attended school in a low-income area with a high rate of violence. The community in this area does not have access to organized physical education classes and has few options for participating in sports activities. The children's participation in the study depended on parental or guardian authorization.

Measures

Peer Aggression Behavior Scale (PAB-S)

The Peer Aggression Behavior Scale (PAB-S), proposed and validated for the Brazilian population by Borsa [24], assesses the aggressive behavior of children aged 7 to 13. It is a self-report questionnaire comprising 25 items, with 15 items focusing on proactive aggressive behaviors and 10 on reactive behaviors. These behaviors encompass direct physical actions (e.g., "When a classmate doesn't do things the way I want, I hit them") and verbal interactions ("I shout at my classmates to do what I want"), as well as indirect and relational behaviors ("I spread rumors about my classmates to become more popular"). Participants rate the items on a five-point Likert scale based on the frequency of occurrence: never happens, happens rarely, happens sometimes, happens almost constantly, and happens always.

Test of Gross Motor Development – 3° Edition (TGMD-3)

The Test of Gross Motor Development – Third Edition (TGMD-3), proposed by Ulrich [25,24] and validated by Valentini and Zanella Webster [26], was utilized to assess fundamental motor skills in children aged 3 to 10 years and 11 months. The test comprises 6 locomotor skills (running, galloping, hopping on one foot, skipping, horizontal jumping, sideways sliding) and 7 object control skills (two-handed strike, stationary dribble, catch, kick, overhand throw, underhand throw, one-handed strike). The test can be administered individually or in pairs.

We evaluated the children individually, and each child performed a trial for each skill, followed by two valid trials recorded on video. The children received a verbal description and a demonstration of each skill before performing it. The evaluation of the videos results in scores of 0 or 1, indicating whether the child fulfills the specific criteria for each skill.

Self-Perception Profile for Children

We assessed children's perceived competence using the Self-Perception Profile for Children questionnaire by Harter [27], which consists of 36 questions across dimensions such as school competence, athletic competence, social competence, physical appearance, behavioral conduct, and global self-concept. Through a Likert scale, children indicate the extent to which they identify with each given situation, ranging from positive to negative. The scale measures the degree of identification, with response options ranging from "Really true for me" to "Sort of true for me."

Procedures

The university's ethics committee approved this research under number 4.330.160. The participants signed an assent form, while their legal guardians signed a consent form. The researchers explained all the information regarding the experiment and their legal rights to children and legal guardians. We adopted all fundamental principles of the Declaration of Helsinki.

The researchers initially contacted the school, presenting acceptance documents that outlined the research objectives and procedures. After obtaining approval, the researchers met with parents and guardians to explain the study's objectives, describe the procedures, and distribute the consent and assent forms to parents, guardians, and children. Subsequently, the research team scheduled data collection on alternating days. Trained evaluators were responsible for administering one test per day for the children.

The administration of the Motor Competence Perception Scale and the PAB-S occurred in a calm and quiet environment to minimize potential external interferences during the assessment. For the TGMD-3, the evaluation prioritized an open space with ample room for performing fundamental motor skills, marked according to the application criteria. We administered the tests individually, lasting approximately 15 to 30 minutes.

The video examiners underwent training sessions and participated in panel discussions to standardize assessment criteria. Two examiners coded the videos, and the intraclass correlation coefficients for inter- and intra-rater reliability ranged from 0.80 to 0.95 for locomotion skills and from 0.83 to 0.97 for object control skills. The intraclass correlation coefficient calculations followed Weir's [28] recommendations.

Statistical analysis

We performed descriptive statistics (mean, standard deviation, and confidence interval) for the variables of motor competence, perceived motor competence, and aggressiveness in both sexes. To compare quantitative variables between sexes, we used the independent-samples Student's t test, adopting a 5% significance level ($\alpha = 0.05$). Subsequently, we run a network analysis to examine the associations between motor competence, perceived motor competence, and aggressiveness in boys and girls. This model represents variables as nodes and relationships between them as edges, which can be positive or negative and vary in thickness according to the strength of the associations.

We estimated a Gaussian Graphical Model (GGM) of regularized partial correlations using EBICglasso, such that each edge represents a conditional association between two variables while controlling for all others [29,30] Because these are (regularized) partial correlations, their magnitudes tend to be smaller than zero-order correlations; therefore, we interpret edge weights descriptively based on their absolute magnitude and avoid treating any single value as a universal "cutoff" for defining interpretive relevance [30]. To communicate magnitude transparently, we adopt benchmarks often used for correlations approximately 0.10 (small), 0.20 (typical), and 0.30 (relatively large) as heuristic guidelines rather than rigid thresholds [29].

Considering that sample size may be a limiting factor for estimating networks with many parameters and, consequently, for interpreting the findings, we adopted statistical regularization techniques to increase model reliability and reduce the likelihood of spurious relationships. Specifically, we estimated an L1-regularized partial correlation network by applying the Least Absolute Shrinkage and Selection Operator (LASSO), a procedure that has shown consistent performance for partial correlation network estimation. This approach shrinks weak edge estimates exactly to zero, resulting in a sparser and more parsimonious network that preserves only the most robust empirical relationships among nodes. Simulation evidence indicates that this procedure has a low probability of false positives, increasing confidence that observed edges reflect genuine relationships even in small samples. [31]. LASSO regularization requires specifying a tuning parameter (λ), which directly controls the level of sparsity in the graph: the larger the λ value, the more edges are removed, and the simpler the final network structure tends to be. Thus, λ must be selected carefully to minimize potentially spurious edges while maximizing the retention of true edges. To do so, we estimated multiple networks across different λ values, ranging from a densely connected network

(with many edges) to an empty network (with no connections), and adopted the λ value that best balanced parsimony and empirical representativeness of the model.

For network visualization, we used the Fruchterman–Reingold algorithm, a proximity-based layout in which stronger relationships tend to appear closer together and weaker relationships farther apart. In addition, estimation was implemented within a Markov random field framework with L1 penalization (regularized neighborhood regression) to optimize network stability and interpretability.

We employed partial correlation (pcor) to quantify relationships among the investigated variables, allowing the estimation of conditional associations between variables of different natures [26]. Key variables driving the network's relational dynamics were identified using centrality measures between closeness and strength which indicate, respectively, nodes that mediate connections, nodes that are more central in terms of distance, and nodes with the strongest associations. To evaluate the accuracy and stability of the parameters, we used nonparametric bootstrap resampling (n = 1000) to estimate 95% confidence intervals for edge weights (supplementary material).

RESULTS

Table 1 presents a descriptive analysis of motor development, aggressivity, and self-perceived competence. In motor performance, approximate means are observed in locomotion skills (t_{85} = -1.518, p = 0.133, d = -0.33), while in object control skills, boys have obtained the highest means (t_{85} = 4.991, p = 0.001, d = 1.09). Concerning aggressiveness, boys and girls presented closer means in reactive aggression (t_{85} = 0.522, p = 0.603, d = 0.11), while in proactive aggressive actions, girls obtained a mean of 2.2 points less than boys, but not statistically significant (t_{85} = 1.488, p = 0.140, d = 0.32). The scores obtained in the different dimensions of self-perceived competence were similar for boys and girls, except for the self-perceived athletic competence (t_{85} = 5.083, p = 0.001, d = 1.11), in which boys obtained the highest mean.

Table 1. Means and standard deviation (SD) of the motor performance in fundamental motor skills, aggressivity and self-perceived competence for boys (n = 35) and girls (n = 52) groups.

	Sex	Mean	SD	Lower	Upper	*p*
Locomotor Skills	*Girls*	34.0	4.0	32.6	35.4	0.133
	Boys	32.2	6.2	30.4	33.9	
Object Control Skills	*Girls*	30.5	5.6	28.5	32.4	0.001*
	Boys	38.5	8.2	36.2	40.8	
Proactive Aggression	*Girls*	4.3	6.1	2.2	6.4	0.140
	Boys	6.5	7.1	4.5	8.5	
Reactive Aggression	*Girls*	5.4	7.4	2.9	8.0	0.603
	Boys	6.2	6.9	4.3	8.1	
Cognitive Competence	*Girls*	17.8	3.8	16.5	19.1	0.341
	Boys	18.6	3.4	17.6	19.5	
Social Acceptance	*Girls*	17.1	3.2	16.0	18.2	0.138
	Boys	18.2	3.4	17.2	19.2	
Athletic Competence	*Girls*	15.8	3.7	14.5	17.1	0.001*
	Boys	19.4	2.8	18.6	20.2	
Physical Appearance	*Girls*	20.3	3.3	19.1	21.4	0.519
	Boys	19.8	3.2	18.9	20.7	
Behavior Conduct	*Girls*	18.9	3.4	17.7	20.1	0.367
	Boys	18.1	3.7	17.1	19.2	
Global Self-Value	*Girls*	20.5	3.2	19.3	21.6	0.833
	Boys	20.3	3.2	19.4	21.2	

* Difference between groups – p<0.05.

Figure 1 shows the network analysis of the associations between fundamental motor skills, aggressive behavior, and self-perceived competence for boys and girls. For boys, proactive aggression showed positive associations with locomotion skills (r = 0.372) and social acceptance (r = 0.256), as well as reactive aggression (r = 0.801). On the other hand, proactive aggression showed negative associations with object control skills (r = -0.327) and global self-value (r = -0.295). For girls, proactive aggression also showed a strong association with reactive aggression (r = 0.832) but weak positive associations with perceptions of physical appearance (r = 0.132) and athletic competence (r = 0.125). On the other hand, a negative association was identified in global self-value (r = -0.206).

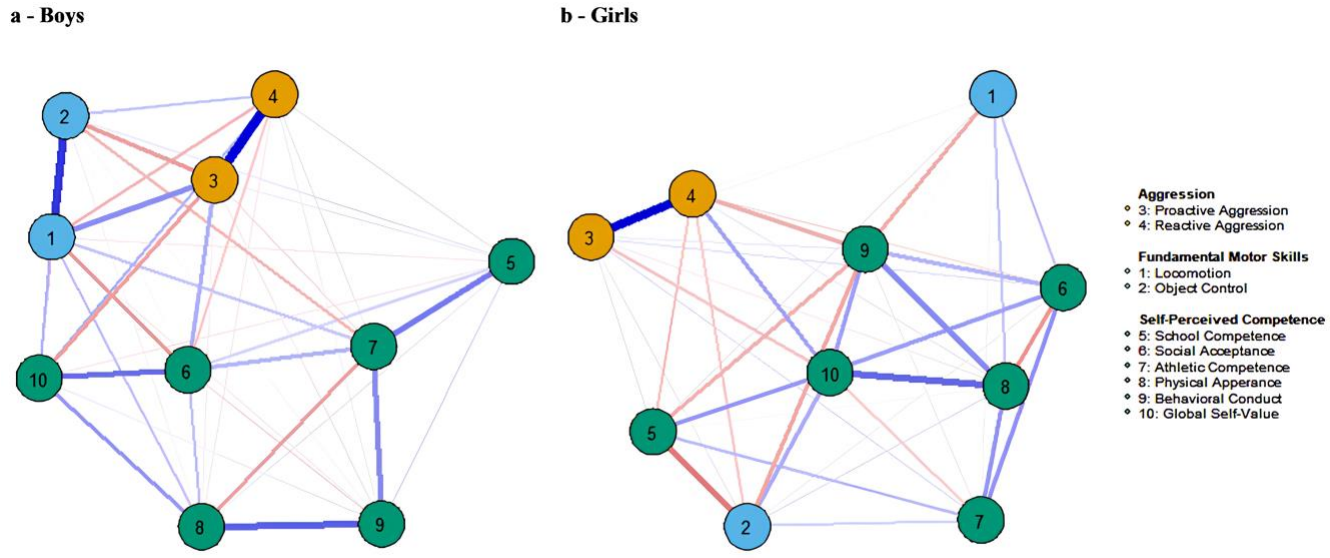

Figure 1. Network analysis of the associations between Fundamental Motor Skills, Aggressive Behavior and Self-perceived Competence for Boys (a) and Girls (b).

For boys, reactive aggression was positively associated with object control skills (r = 0.205) and global self-value (r = 0.247). On the other hand, reactive aggression presented negative associations with locomotion skills (r = -0.236) and perceived physical appearance (r = -0.166). For girls, reactive aggression showed a positive association with global self-value (r = 0.321) and negative associations with object control skills (r = -0.181), school competence (r = -0.201)), social acceptance (r = -0.135) and behavioral conduct (r = -0.272). The weight matrices of network analysis for Boys and Girls groups are presented below (Tables 2 and 3) to examine these associations.

Table 2. Weight matrix of Boys network.

	1	2	3	4	5	6	7	8	9
1	0								
2	0.637								
3	0.372	-0.327							
4	-0.236	0.205	0.801						
5	-0.078	0.094	0.057	-0.078					
6	-0.308	-0.008	0.256	-0.166	0.144				
7	0.199	-0.238	-0.127	0.055	0.44	0.251			
8	0.204	-0.036	-0.046	-0.062	0.078	0.202	-0.283		
9	-0.059	-0.019	-0.067	0.037	0.135	-0.135	0.364	0.501	
10	0.240	-0.167	-0.295	0.247	-0.086	0.462	-0.031	0.331	0.064

Legend: 1 – Locomotor Skills, **2** – Object Control Skills, **3** – Proactive Aggression, **4** – Reactive Aggression, **5** – Perceived Cognitive Competence, **6** – Perceived Social acceptance, **7** – Perceived Athletic Competence, **8** – Perceived Physical Appearance, **9** – Perceived Behavior Conduct, **10** – Global Self-Value. **Note:** In the heatmap table, blue represents positive correlations while pink represents negative correlations.

Table 3. Weight matrix of Girls network.

	1	2	3	4	5	6	7	8	9
1	0								
2	0.008								
3	0.027	0.055							
4	-0.017	-0.181	0.832						
5	0.071	-0.433	0.061	-0.201					
6	0.211	-0.049	0.132	-0.135	0.03671				
7	0.03	0.146	0.125	-0.014	0.23913	0.36598			
8	0.189	0.111	-0.068	0.08	0.02234	-0.3534	0.35716		
9	-0.275	-0.288	0.089	-0.272	-0.263	0.26375	-0.0594	0.382	
10	0.003	0.27	-0.206	0.321	0.34808	0.32803	-0.1507	0.506	0.3148

Legend: 1 – Locomotor Skills**, 2** – Object Control Skills, **3** – Proactive Aggression, **4** – Reactive Aggression**, 5** – Perceived Cognitive Competence, **6** – Perceived Social acceptance, **7** – Perceived Athletic Competence**, 8** – Perceived Physical Appearance, **9** – Perceived Behavior Conduct, **10** – Global Self-Value. **Note:** In the heatmap table, blue represents positive correlations while pink represents negative correlations.

Table 4 demonstrates that measures of centrality show different results for boys and girls regarding betweenness, closeness, and strength. In the measure of betweenness, which represents the intermediation ability of a variable with different pairs of nodes in the network, athletic competence was the most influential variable for boys (2.231). On the other hand, for girls, global self-value showed a higher index (1.936).

Concerning closeness, the locomotion score (1.203) was the variable that seemed to maintain closer relationships with the other variables for boys, while for girls, global self-value (1.541) and behavioral conduct (1.402) presented the highest indices. Finally, for boys, proactive aggression (1.377) and locomotion (1.340) present greater strength in associations with other variables within the network. For girls, the global self-value was highlighted again, demonstrating the highest index for strength (1.470). The CS-coefficients for centrality indices were low, demonstrating low stability, which is expected in networks estimated from small samples.

Table 4 - Measures of centrality of the networks.

Variables	Betweenness		Closeness		Strength	
	Boys	Girls	Boys	Girls	Boys	Girls
Locomotion	-0.066	-0.786	1.203	-1.416	1.340	-2.068
Object Control	0.262	-0.786	0.434	-0.511	-0.310	-0.515
Proactive Aggression	0.591	-0.786	0.027	-1.045	1.377	-0.393
Reactive Aggression	-1.050	1.331	-1.114	-0.204	0.115	0.591
School Competence	-1.050	-0.484	-1.914	0.095	-1.800	-0.225
Social Acceptance	-0.394	-0.484	0.877	-0.008	0.231	0.205
Athletic Competence	2.231	-0.786	0.411	-0.714	0.390	-0.643
Physical Appearance	0.262	0.121	0.330	0.861	-0.280	0.638
Behavioral Conduct	-1.050	0.726	-0.957	1.402	-1.276	0.940
Global Self-Value	0.262	1.936	0.703	1.541	0.213	1.470

DISCUSSION

The study examined the relationships between motor competence, self-perceived competence, and aggressive behavior through network analysis. Results demonstrated that the relationships between these studied variables differ between boys and girls. For boys, aggression has a positive relationship with motor competence (sometimes with locomotion skills, sometimes with object control skills), which was not observed in girls. On the contrary, in the girls' network, the nodes representing aggressive behavior (reactive and proactive) were located far from the nodes of fundamental motor skills (locomotion and object control skills). Furthermore, considering the importance of the variables in the network through the analysis of centrality measures, it can be inferred that locomotion skills have stronger and closer relationships with the other variables for boys. On the other hand, for girls, the perception of global self-value appears to be the most influential variable in the network.

In parts, the results did not demonstrate consistency with the findings of previous studies. For example, the literature has argued that children with higher peer acceptance exhibit lower levels of aggressiveness [11,12]. Our results do not demonstrate strong associations between social acceptance and proactive and reactive aggression. However, for both boys and girls, social acceptance correlates positively with proactive aggression and negatively with reactive aggression. This finding is interesting since reactive and proactive aggression have distinct connections with a range of behaviors [32,33]. Vitaro et al. [22] suggests that aggressive behavior is associated with social and psychological gains when used in a planned manner, pointed that children who exhibit proactively aggressive behavior are generally well-accepted by their peers [34]. On the other hand, children who exhibit reactively aggressive behavior are more rejected and more victimized by their peers and have fewer friends [22].

Fite and Vitulano [35] highlighted that physical activity influences proactive and reactive aggression differently. Since motor competence depends on childhood physical activity [36], it was expected to find distinct relationships between proactive and reactive aggression. For boys, motor competence in object control is negatively correlated with proactive aggression. Since object control skills serve as a foundation for more complex movements, such as those required in sports [37], boys with higher proficiency in these skills may be more actively engaged in physical activities. Although this study did not directly assess physical activity levels, our findings align with the negative association between physical activity and proactive aggression reported by Fite and Vitulano [35].

On the contrary, in girls, we identified other relations in the network. Perhaps because they demonstrated lower motor performance levels in these skills (i.e., object control skills) than boys. The relationships observed in the network analysis between motor competence in object control skills and the aggressiveness dimensions are of very low magnitude for girls. Typically, girls perceive themselves as having lower motor competence compared to boys, even when motor performance is similar between the sexes [38], with girls underestimating their actual motor competence [39]. In fact, in the present study, girls presented a lower perception of athletic competence, although they presented performance similar to that of boys in locomotion skills, but lower in object control skills. However, we acknowledge that the small sample size and differences in the number of groups are significant limitations regarding the generalizability of the findings, although some of the results found here corroborate the literature.

Thus, network centrality measures allow us to explore the differences observed between boys and girls. In boys, the perception of athletic competence seems to exert the greatest mediating power among network components, whereas in girls, global self-worth appears to play this role. Sociocultural factors may explain these differences, as boys typically receive greater encouragement to participate in physical activities early 40–42. This early reinforcement likely contributes to boys' higher betweenness index of athletic competence perception.

Aggression analysis revealed an intriguing pattern: proactive aggression negatively correlates with self-esteem (inferred from global self-worth) in both boys and girls, while reactive aggression shows a positive association. However, the role of aggression in the network differs by sex. In girls, reactive aggression mediates relationships between network components, whereas in boys, proactive aggression stands out due to the strength of its associations, as indicated by centrality measures. These two forms of aggression represent distinct phenomena. Proactive aggression is a learned behavior [43] aimed at achieving a goal in a planned, deliberate, and instrumental manner. In contrast, reactive aggression emerges as an impulsive response to provocation or perceived threat [44,45]. Our findings align with Lee's [46] study, which demonstrated that children with higher self-esteem are more likely to display defensive aggressive behaviors (i.e., reactive aggression) and less likely to engage in proactive aggression. Although the stability coefficient for the centrality measures was unsatisfactory to guarantee stability, it is interesting to note that even in an exploratory manner, part of the interpretation of the findings corroborates previous studies.

We consider our cross-sectional design a limitation that prevents establishing causal relationships between motor competence, self-perceived competence, and aggressive behavior. The relatively small sample size (and differences in the proportion of boys and girls), restricted to children from economically disadvantaged and violence-prone areas, also limits the generalizability of the findings to broader populations. Furthermore, the study did not assess the children's actual physical activity levels, which could offer additional insights into the observed relationships. Future research should adopt longitudinal designs to better understand how motor competence, self-perception, and aggressive behavior interact over time. Another suggestion for future studies is that actual aggressiveness could also be assessed and compared to perceived aggressiveness, just as we did with motor skills. Additionally, incorporating measures of physical activity levels and sociocultural influences would provide a more comprehensive perspective on the factors shaping these relationships.

CONCLUSION

Our findings suggest distinct patterns of association among motor competence, self-perceived competence, and aggressive behavior between boys and girls, highlighting the importance of considering sociocultural factors and gender-specific dynamics in understanding these relationships. For boys, aggression showed positive correlations with certain motor skills, particularly locomotion skills, while no such relationship was observed in girls. Instead, girls' networks were more influenced by global self-worth, suggesting that self-perception plays a more central role in their behavioral dynamics. The study also found that proactive and reactive aggression have different associations with motor competence and self-perception, particularly in boys. Proactive aggression was negatively associated with object control skills and global self-value, while reactive aggression showed positive associations with global self-value. These findings suggest that distinct factors, such as physical activity engagement and self-esteem, may influence different types of aggression. As this is the first study to investigate the relationships between motor competence, perception of competence, and aggressiveness, we offer some

preliminary considerations, highlighting the need for future studies that can overcome our limitations.

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