Original Article

THE RELATIONSHIP BETWEEN GENERAL PERCEIVED MOTOR COMPETENCE, PERCEIVED COMPETENCE RELATIVE TO MOTOR SKILL AND ACTUAL MOTOR COMPETENCE IN CHILDREN

RELAÇÃO ENTRE A COMPETÊNCIA MOTORA PERCEBIDA GERAL, O GÊNERO, A COMPETÊNCIA MOTORA PERCEBIDA ESPECÍFICA À TAREFA E A COMPETÊNCIA MOTORA REAL DE CRIANÇAS

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RESUMO

O Objetivo deste estudo foi investigar as relações entre a competência motora percebida geral (CMPG), a competência motora específica à tarefa (CMPET), a competência motora real (CMR), e o gênero de crianças. Participaram do estudo 75 crianças, de ambos os gêneros, com nove e dez anos de idades. A CMPG foi avaliada pela "*Self-Perception Profile for Children"*. Uma escala desenvolvida pelos autores e preliminarmente validada foi utilizada para avaliação da CMPET. A CMR foi avaliada pelo *Test of Gross Motor Development – 2*. Os resultados indicam que independentemente do gênero, a maioria das crianças, percebeu-se moderadamente competente e reportou realizar as habilidades motoras com pouca ou sem dificuldade. As correlações foram fracas e não significativas entre a CMPG, a CMPET e a CMR na maioria das habilidades. Conclui-se que: não houve relação entre a maneira pela qual a criança avalia e a sua própria competência motora na maioria das habilidades em ambos os gêneros. Possivelmente crianças se utilizam de outros parâmetros, sem considerar a própria proficiência em habilidades motoras fundamentais para julgar suas competências.
Palavras-chave: Percepção. Habilidades motoras. Crianças.

ABSTRACT

The aim was to investigate the relationship among the general perceived motor competence (GPMC), the perceived competence relative to tasks (PCRT), the actual motor competence (AMC), and the gender in children. Seventy-five children, boys nd girls, aged between 9 and 10 years, participated in the study. The GPMC was assessed using the *Self-Perception Profile for Children*. We used a scale developed by the authors for this study, preliminarily validated, to assess the PMCRM. The AMC was assessed by the *Test of Gross Motor Development – 2*. The results showed children perceived themselves as moderately competent and reported their own motor competence relative to motor skill as "little or no difficulty". The correlations were weak and not significant between GPMC, PCRT and AMC for the majority of the skills. In conclusion, there was not relationship between the ways in which the children evaluate their own motor competence in the majority of the skills, for boys and girls. Children most likely use other parameters, without considering their own proficiency in fundamental motor skills to assess their competencies.
Keywords: Children. Perceived competence. Motor skills

Introduction

Perceived competence is understood as the attributes and characteristics that are consciously recognized by the individual through language[1-3]. This important psychological aspect has been the focus of studies in various areas of human behavior[4,5]. In the context of motor practice, perceived competence is the mediator of the motivation to learn motor skills and the practice of physical activity throughout life [6,7].

Studies have investigated how this psychological variable is associated with mastery of fundamental motor skills in childhood[4,8-10]. To do so, they often use measurement scales of perceived competence for general or specific tasks. GPMC measurements – such as the "Self Perception Profile for Children"[1], the "Pictorial Scale for Perceived Competence and Social

Acceptance for Young Children"[11], "New General Self-efficacy Scale"[12], "Generalized Self-efficacy Scale"[13] "Source of Information Competence Scale - SCIS"[14] "Perceived Efficacy and Goal Setting in Young Children"[15] – include questions on children's perceptions about being proficient or not when playing sports; on their competence in carrying out new sports activities; on whether they prefer to play or watch games[3,16]. Therefore, these measurements use scales that allow children to perform a self-assessment of their proficiency in sports and their athletic ability in general[3,16].

PCRT measurements include the children's assessment on their own ability whether to perform or not specific motor tasks such as reaching a given object with their hand[17] or foot[18]; being able to jump a certain distance[18-20] or even reporting their own competence in performing basic motor skills of locomotion and controlling objects[21]. In these specific measurements, the results are usually expressed in terms of accuracy or percentage of error in the task perception, considering as a parameter the inherent competence demonstrated by the child[5.17] and confronting it to the child's own perception on how they carried them out.

Regardless of the scale used, researches have been investigating the relationship between the PCRT and the AMC in children emphasizing the importance of these constructs throughout childhood[9,10,17,21,22]. However, there is an inconsistency in the results so far reported in the literature: sometimes they provide support to the relationships between motor performance and the children's AMC and GPMC[9,10,21,23,24], and, in other occasions, they question it[17.22]. This disparity has been attributed to the poor specificity of scales of children's self-perception; in general, what is measured is the AMC in locomotion skills and object controlling related to the perception of motor tasks of a child's daily life, such as jumping rope and hanging in rails at the playground. This lack of specificity in accessing children's perceptions reflects on the weakened relationships with motor skills[17.22]. Another plausible explanation stems from the lack of parameters of the youngest children to assess their skills realistically[22], and from their inability to differentiate their own competence in different types of motor skills, such as locomotion and object control[10.21].

With regard to gender, boys have often shown more AMC in different motor skills [9,21,25,26] and greater GPMC regarding motor and sports activities[9.27] when compared to girls. However, although gender manifests itself as a mediator in the way boys and girls assess their own skills, its influence and its predictive capacity has been little investigated in the literature. One of these few studies suggests that being a male partially explains the variability in competence in object control skills[21]. However, they did not investigate this relationship in locomotion skills and the analysis did not consider the perceived competence related to the task. Further research is needed to clarify the relationship between these variables considering the specificity of motor tasks and the gender of children.

With his in mind, the aim of this study was to investigate the relationship between general perceived motor competence (GPMC), the perceived competence related to task (PCRT), the actual motor competence (AMC), and the children's gender. Due to the difficulty children have to recognize the appropriate parameters for the self-assessing their own competence, the hypothesis made in this study is that, regardless of gender, children would be inaccurate as to the general and specific perceptions of competence in motor tasks.

Materials and methods

Study participants

Seventy-five children (55 girls and 20 boys), aged between nine and ten years (9.2 + 0.68 years), from schools in the city of Juazeiro do Norte – CE, voluntarily took part in this

associative study. Children were intentionally selected according the following inclusion criteria: attending school; absence of neurological disorders or physical limitations (as reported by parents, teachers and/or psycho-pedagogical assistants and health professionals from schools) that could have hindered the performance of the motor tests and self-perceived competence. Children are residents from two neighborhoods located in the peripheral urban area and from low socioeconomic level (family income up to two minimum wages and assisted by a government social project). The children did not attend physical education classes in school curricula, but participated in a government sports program of social nature offered to low-income families, twice a week, with an average of two hours per session. This program prioritized pre-sports activities: handball for the girls and indoor soccer for boys.

Instruments

We used the "Self-Perception Profile for Children" (SPPC)[1] to assess the children's general perceived motor competence (GPMC), validated for use with Brazilian children by Valentini[16]. The Brazilian version (self-perception scale for children - SPSC) showed content validity coefficients within acceptable values, considering the clarity (0.68 to 0.91) and relevance (0.86 to 0.89) criteria for the six dimensions of the instrument and for the total score. The correlation results between the scores of test-retest reliability were significant and ranged from r=0.83 to r=0.54. The confirmatory factor analysis showed satisfactory indices for the overall sample (x²/gl=4.33; Non-normed Fit Index=0.958; Comparative fit index=0.967 and Tucker and Lewi's index of fit=0.962). For males (x²/gl = 3.00; Non normed fit index = 0.942; Comparative fit index = 0.960 and Tucker and Lewi's index of fit = 0.954) and for the females (x²/gl = 3.01; Non normed fit index = 0.943; Comparative fit index = 0.961 and Tucker and Lewi's index of fit = 0.955). The SPSC, thus, proved to be valid to evaluate the children's GPMC[16]. The instrument contains six subscales (which can be used separately) in five specific areas of competence: cognitive competence, social acceptance, motor competence, physical appearance, behavioral conduct, in addition to the overall self-concept. Each subscale of the Self Perception Profile for Children contains six questions, making a total of 36 questions, organized in a Likert-type scale questionnaire, ranging from 1 to 4 points. In this study, we used the six questions related to motor competence subscale.

A preliminary scale, devised by the authors of this study, consisting of 12 items related to locomotion skills (run, gallop, hop, leap, horizontal jump, slide) and object control (striking a stationary ball, stationary dribble, kick, catch, overhand throw, and underhand roll) was used to evaluate the perceived motor competence related to task. This scale, based on motor skills evaluated by the Test of Gross Motor Development[2], was organized in a Likert-type structure ranging from 0 to 3 (0 – I cannot do it; 1 – I do it with great difficulty; 2 – I do it with little difficulty and 3 – I do it without any difficulty).

The scale was subjected to content validity process (face and internal consistency) to be used in this research. This validation involved a panel of experts, consisting of three PhD professors in motor development. From a Likert-type scale of 5 points, the experts individually assessed the clarity of the language and the relevance of all the items of the instrument[27]. The content validity coefficients showed a high clarity of language index, with scores ranging from 96.2% to 98.4%. As for the relevance, the items also showed high values (94.1% to 98.3%). The Kappa coefficients were high and significant (Expert 1 X Expert 2: 0.88 p <0.001; Expert 1 x Expert 3: 0,91p <0.001; Expert2 x Expert 3: 0.87 p <0.001; Expert 1 X Expert 2 X Expert. 3: 0.91 p <0.001. The internal consistency of the scale was also evaluated, using the alpha for ordinal data based on polychoric correlations. The internal consistency of the total items, items related to the movement and object control dimensions

were also evaluated. High internal consistency indices for the dimension of object control (alpha = 0.9) and for the total scale (0.88) were reported. The index for the movement dimension was acceptable (alpha = 0.70). These indices allowed the use of this scale in this study.

We assessed the children's Actual Motor Competence (AMC) with the Test of Gross Motor Development, second edition – TGMD-2[2], validated for the Brazilian population by Valentini (2012). The Brazilian version of TGMD-2 presented a high extent of agreement for clarity of language (greater than 0.96) and relevance (greater than 0.89). As for content validity, it also showed high levels of clarity ($\alpha = 0.93$) and relevance ($\alpha = 0.91$) in the judges' assessment. The test-retest correlations have shown to be strong, significant and positive to movement subtest ($r = 0.90$, $p < 0.001$) and object control ($r = 0.83$, $p < 0.001$). The correlations in all motor tasks ranged from moderate to strong, positive and significant ($r = 0.51$ to 92 $p < 0.001$). Appropriate indices of confirmatory factorial validity (root mean square error of approximation = 0.06, comparative fit index = 0.88; Tucker-Lewis index = 0.83; normed fit index = 0.09; goodness-of-fit index = 0.98, adjusted goodness-of-fit index = 0.95) were reported. Therefore, the TGDM-2 is a valid and reliable instrument to evaluate the motor performance of Brazilian children. This battery assesses 12 large motor skills (six in the dimension "object control", which comprises the tasks of batting, bouncing, throwing, rolling, kicking and grabbing, and six in the dimension "locomotion", which includes the skill evaluation of running, horizontal jumping, galloping, jumping on one foot, running sideways and stride[2.28].

Procedures

The Ethics Committee on Human Research (protocol 19861) approved this study. We contacted the Municipal Secretary of Education for approval and support regarding the research implementation. Thus, the managers referred 25 schools in which we could carry out our research. We got in touch with the suggested schools and they all agreed to participate. We selected two schools, using the following criteria: 1) having a high number of children aged between eight and 10 years in the school; 2) being located in the city urban area; 3) having and providing adequate physical space for applying the motor tests (gym, sports court or an open courtyard), and 4) providing adequate physical space for applying the perceived competence assessment scales (closed room). After the consent of the schools' managers, we held meetings with the children's parents and guardians in order to explain the procedures we would follow in the evaluation of perceived competence and motor tests. Only those students whose parents or legal guardians signed the Informed Consent Form (IC) participated in the research. The GPMC scale was individually applied, in rooms intended for tutoring children. Evaluators were trained to administer the SPSC and the average time was 20 minutes. In this study, the GPMC was computed by adding the scores of questions on the motor subscale.

The PCRT scale was applied immediately after the demonstration of motor skills by the examiner and before kids performed them. The child would assess their own motor perceived competence using the instrument scale ranging from "I cannot do it" to "I can do it without any difficulty." The PCRT was obtained with the Likert-type scale score for each motor skill. In addition, we calculated the scores regarding the competence related to the movement and to object control by adding the scores of perceived competence of motor skills related to those dimensions.

We assessed the children's AMC at the appropriate sites for motor practices provided by the participating schools. The TGDM-2 was applied by trained evaluators, with at least one year of experience. Each assessment lasted 20 minutes on average and was performed with

two children alternately. We considered the performance score of each skill of the TGMD-2 for the AMC as well as the sum of the scores of locomotion skills and object control skills.

Statistical analysis

Data were described by mean, standard deviation, frequency and relative percentage. Spearman correlations were used to determine the extent and direction of linear relationships between variables assuming: r = 0 "zero correlation"; r <0.1 "very weak correlation"; r between 0.1 and 0.3 "weak"; r between 0.3 and 0.5 "moderate"; r between 0.5 and 0.7 "strong"; r between 0.7 and 0.9 "very strong"[29]. Multiple linear regression analyzes were conducted considering the AMC as a dependent variable and gender, GPMC, PCRT of locomotion and object control as independent variables. The stepwise method was used. The significance level was α ≤0.05. Analyses were performed using the Statistical Package for Social Sciences (SPSS - v.21.0) and software R (R Development Core Team, 2015; package "psych")[30,31].

Results

Actual Motor Competence

The descriptive analysis of children's AMC are shown in Table 1. As for the maximum score to be achieved in motor skills, we observed that "leap" and "cath", for the girls, and "cath, gallop, leap, and underhand roll", for the boys, were the skills with an average score closest to the highest.

Table 1. Mean and standard deviation of AMC of children according to gender.

Skills	Locomotion				Object Control		
	Máx	**Female**	**Male**		**Máx**	**Female**	**Male**
Run	8.0	4.8 (1.3)	3.7 (1.1)	Strike	10.0	4.6 (1.3)	5.2 (0.8)
Gallop	8.0	4.7 (1.5)	5 (0.7)	Stationary drible	8.0	4.1 (1.2)	4.5 (0.5)
Hop	10.0	4.2 (1.5)	4.5 (0.8)	Cath	6.0	3.6 (0.6)	3.7 (0,4)
Leap	6.0	3.8 (0.7)	3.1 (0.7)	Kick	8.0	4.4 (1.5)	4.2 (0,7)
Horizontal Jump	8.0	3.9 (0.7)	4.1 (0,3)	Overhand throw	8.0	4.7 (1.2)	3.7 (1.1)
Slide	8.0	4.1 (0.7)	4.7 (0.8)	Underhand roll	8.0	4.6 (0.7)	5 (0.7)

Legenda: * Máx: Maximum score possible
Source: The authors

General Perceived Motor Competence

The average score was 14.7 ± 1.9 (12-19) points for the boys and 12.5 ± 3.2 (8-17) for girls on the GPMC. The majority of children reported a GPMC ranging from moderate (81.8% girls and 50% boys) to high (18.2% girls and 25% boys).

Perceived Competence Relative to Task

The overall results on the categorization PCRT according to gender are shown in Table 2. Most children reported to perform the motor skills investigated in this study "with little difficulty" or "no difficulty". No boy reported he could not perform the motor skills. 18.2% of girls reported they could not perform the galloping ability.

Relationship between the Actual Motor Competence, General Perceived Motor Competence, and Perceived Competence Relative to Task

The Spearman correlation analyses between GPMC, PCRT and AMC can be seen in Table 3. On the relationship between GPMC and AMC, there was a significant weak correlation and only positive in the "throw" taks (r = .271). The analysis showed a significant moderate negative correlation (-.322 p <.001) between the GMPC and AMC in "run" and a significant strong negative correlation, (-.521 p <.001) between GMPC and AMC in "underhand roll".

Table 2. Description of the children's PCRT.

Skills	Locomotion								Object control								
	Female				Male					Female				Male			
	NF	FM	FP	FS	NF	FM	FP	FS		NF	FM	FP	FS	NF	FM	FP	FS
Run	-	10 (18.2)	30 (54.5)	15 (27.3)	-	10 (50)	10 (50)	-	Strike	-	10 (18.2)	40 (72.7)	5 (9.1)	-	5 (25)	5 (25)	10 (50)
Gallop	10 (18.2)	5 (9.1)	25 (45.5)	15 (27.3)	-	5 (25)	10 (50)	5 (25)	Stationary drible	5 (9.1)	5 (9.1)	10 (18.2)	35 (63.6)	-	-	5 (25)	15 (75)
Hop	5 (9.1)	10 (18.2)	25 (45.5)	15 (27.3)	-	5 (25)	10 (50)	5 (25)	Cath	5 (9.1)	10 (18.2)	25 (4.5)	15 (27.3)	-	-	5 (25)	15 (75)
Leap	-	5 (9.1)	20 (36.4)	30 (54.5)	-	-	5 (25)	15 (75)	Kick	-	5 (9.0)	25 (45.5)	25 (45.5)	-	-	5 (25)	15 (75)
Horizontal Jump	-	10 (18.2)	40 (72.7)	5 (9.1)	-	-	15 (75)	5 (25)	Overhand throw	-	15 (27.3)	20 (36.4)	20 (36.4)	-	-	5 (25)	15 (75)
Slide	5 (9.1)	5 (9.1)	15 (27.3)	30 (54.5)	-	-	5 (25)	15 (75)	Underhand roll	5 (9.1)	5 (9.1)	15 (27.3)	30 (54.5)	-	-	-	20 (100)

Keys: NF – I cannot do it; FM – I do it with great difficulty FP – I do it with some difficulty; FS – I do it without any difficulty
Source: The authors.

Table 3. Correlation Between GPMC, PCRT and AMC in the children's fundamental motor skills.

Actual motor Competence	Perception Run	Perception Gallop	Perception Hop	Perception Leap	Perception Horizontal jump	Perception Slide	Perception general motor competence
Locomotion							
Run	-.322*	-	-	-	-	-	-.040
Gallop	-	.065	-	-	-	-	-.087
Hop	-	-	-.096	-	-	-	0.45
Leap	-	-	-	-.018	-	-	.157
Horizontal Jump	-	-	-	-	0.255	-	-.131
Slide	-	-	-	-	-	.096	.143

Object Control	Perception Strike	Perception Drible	Perception Cath	Perception Kick	Perception Overhand Throw	Perception Underhand roll	
Strike	.086	-	-	-	-	-	.051
Stationary drible	-	-.173	-	-	-	-	-.110
Cath	-	-	-.042	-	-	-	-.058
Kick	-	-	-	-.069	-	-	-.168
Overhand throw	-	-	-	-	-.262	-	.271*
Underhand roll	-	-	-	-	-	-.521*	.052

Keys: *- significant correlation p≤ 0.05
Source: The authors

The analyses showed no significant correlations between PCRT and AMC in the locomotion (r = - 0.199, p = .613) and object control (r = - .182 p = .234) scores. No significant correlations were observed between GPMC and AMC in locomotion (r = -. 020 p = .527) and object control (r = -. 035 p = .864). There were no significant models in multiple linear regression analysis regarding gender (β = -. 120 p = 0.344), GPMC (β = -. 016 p = .900), PCRT for locomotion (β = -. 187 p = .112) and it explained only 5% of AMC for locomotion [r2 = 0:05 = F (3.74) = 1.312 p = .277]. Similarly, the analyses did not show any significant models regarding gender (β = .155 p = .391), GPMC (β = .079 p = .535) and PCRT to the object control (β = -. 219 p = .081) to explain the variation of AMC to object control [r2 = .044 F = (3,74) = 1.100 p = .355].

Discussion

The aim of this study was to investigate the relationship between General Perceived Motor Competence (GPMC), the Perceived Competence Relative to Task (PCRT), the Actual Motor Competence (AMC), and children's gender. Our study showed a higher percentage of children, boys and girls, with a moderate level of GPMC. These results are similar to previous studies on PCRT[27,32], in which most children reported to perform most of the skills investigated with little or no difficulty.

Our study showed no significant correlations between the GPMC and the AMC in most of the investigated skills. A significant weak correlation was seen only at "throw" with this variable. The analyses also indicated no significant associations between the GPMC, gender and the scores obtained for locomotion and object control. Previous studies have reported significant positive associations between the GPMC and the AMC for locomotion, object control[10] and general motor score[9,10]. However, Gabbard, Caçola and Cordova[17] reported no significant associations between GPMC and AMC in a specific task of reaching an object by hand. Spessato et al.,[22] also reported no significant associations between the perceived motor competence and the general motor competence of boys and girls.

Researchers justify this lack of correlation between these variables by the poor specificity of general scales of perception (such as the scale used in this study developed by Harter and Pike in 1984)[11] and by the instruments to assess gross motor tasks (such as TGMD-2)[17.22]. This scale enables the children to assess their own proficiency when practicing sports; on their competence in performing new sport activities[2,16], without requiring the self-assessment in a particular performance situation. It is possible that, regardless of gender, the children studied did not recognize that the performance in sports is related or it also depends on the proficiency in basic skills such as jumping, bouncing, kicking, throwing, for example, and that these are used in sport practice. When assessing motor competence in situations of sports in general, the children in this study may not understand that motor competence also depends on the performance in motor skills; or that they may not have used them as a parameter to evaluation their own proficiency in the skills investigated.

Specific-to-the-task perceived motor competence also showed no significant correlation with AMC in most of the investigated motor skills. Two skills (running and rollin) indicated significant associations, but negative. There was no correlation between the AMC, gender and SPMC in locomotion and object control scores. Different from these results, Barnett, Ridgers and Salmon[21] reported positive associations in younger children between GPMC and AMC in the dimension of object control. We established as a hypothesis in this study that regardless of gender, children would be inaccurate regarding the general and

specific perceptions of competence in motor tasks. This inaccuracy stems from the difficulty in recognizing their own motor proficiency or in the lack of it as parameters to the self-assessment, since they lack previous experience and are not exposed to programs that provide appropriate feedback on performance[33]. Although we did not measure these aspects, boys and girls are likely to have used parameters more related to the result of the movements, their motor experiences, such as reaching the marking lines on shifting tasks, just bouncing or holding the ball, hitting the ball when batting or kicking, in order to assess their own performance in motor skills, without taking in consideration the movement pattern or form. This limitation in using benchmarks to assess their own skills may be due to their little experience in appropriate motor activities[31]. Participation in contexts offering adequate motor practice helps children understand, build and use more diverse parameters to assess their skills in sports, games and active leisure activities.

The relevance of this study was to investigate the relationship between motor performance and the GPMC and AMC in children's motor skills also taking in account the possible associations with gender. The description of the motor practice contexts and the sources of information (adults, previous experiences, peers) used by the children as parameters to evaluate their own skills were not investigated and are limitations in this study.

Conclusion

Most of the children surveyed reported moderate to high level of GPMC. They saw themselves as competent in performing most of the motor tasks investigated. The results seen in this study suggest there was no correlation between the way in which the children assessed themselves (general or specific to the task) and their real competence for boys and girls in most of the investigated motor skills. They most likely use other parameters to evaluate their actual competence, such as the result of the motor action (running to the indicated location, hitting the ball when batting, managing to kick the ball towards the goal) without, however, taking in consideration their own proficiency in fundamental motor skills (more qualitative aspects of movement).

Participating in appropriate motor practices would help these children to build and use more diversified parameters to evaluate their own GPMC and SPMC. This is particularly important since the GPMC is one of the most significant factors for continuing motor practices and it is also important for one's self-esteem and self-perception. Physical education teachers, among other professionals, should consider implementing strategies that help children to build a perceived competence based on the greatest diversity of parameters. When using various parameters, children can evaluate themselves more clearly, realistically and competently. We would suggest in future studies, the analysis of instruction and teachers' feedback as well as the organization of motor practices as elements that influence the construction of the GPMC and SPMC.

References

1. Urich DA. Test of Gross Development, 2nd edition: Examiner's Manual. 2. ed. Austin: PRO-ED; 2000.

2. Harter S. Self-perception profile for children: manual and questionnaires (grades 3 – 8). Denver: University of Denver, Departament of Psychology; 2012.

3. Harter S. The Perceived Competence Scale for Children. Chil Dev 1982;53:87–97.

4. Piek JP, Baynam GB, Barrett NC. The relationship between fine and gross motor ability, self-perceptions and self-worth in children and adolescents. Hum Mov Sci 2006;25(1):65–75.

5. Johnson DC, Wade MG. Children at risk for developmental coordination disorder: Judgement of changes in action capabilities. Dev Med Child Neurol 2009;51(5):397–403.

6. Barnett LM, Van Beurden E, Morgan PJ, Brooks LO, Beard JR. Does Childhood Motor Skill Proficiency Predict Adolescent Fitness? Med Sci Sport Exerc 2008;40(12):2137–44.

7. Valentini NC, Rudisill ME. An inclusive mastery climate intervention and the motor skill development of children with and without disabilities. Adapt Phys Act Q 2004;21(4):330–47.

8. Robinson LE, Goodway JD. Instructional Climates in Preschool Children Who Are At-Risk. Part I. Res Q Exerc Sport 2009;80(3):533–42.

9. Villwock G, Valentini NC. Percepção de competência atlética, orientação motivacional e competência motora em crianças de escolas públicas: estudo desenvolvimentista e correlacional. Rev Bras Educ Fís e Esporte 2007;21(4):245–57.

10. Robinson LE. The relationship between perceived physical competence and fundamental motor skills in preschool children. Child Care Health Dev 2011;37(4):589–96.

11. Harter S, Pike R. The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children. Chil Dev 1984;55(6):1969–82.

12. Chen G, Gully SM, Eden D. Validation of a New General Self-Efficacy Scale. Organ Res Methods 2001;4(1):62–83.

13. Schwarzer R, Jerusalem M. Generalized Self-Efficacy scale. In: Weinman J, Wright S, Johnston M, editors. Measures in health psychology: A user's portfolio Causal and control beliefs. Windsor: NFER-NELSON; 1995, p. 35-37.

14. Horn TS, Amorose AJ. Sources of competence information. In: Duda JL, organizador. Advancements in sport and exercise psychology measurement. Morgantown: Fitness Information Technology; 1998, p. 39-63.

15. Missiuna C, Pollock N. Perceived efficacy and goal setting in young children. Can J Occup Ther 2000;67(2):101–9.

16. Valentini NC, Villwock G, Fiorese L, Vieira, JLL, Levi M, et al. Brazilian Validity of the Harter' Self-perception Profile for Children. Psicol Reflex Crít 2010;23(3):411–9.

17. Gabbard C, Caçola P, Cordova A. Is perceived motor competence a constraint in children's action planning? J Genet Psychol 2009;170(2):151–8.

18. O'Grady EL, Pangelian MM, Clark JE. The Relationship Between Self-Perceived Motor Capabilities and Actual Movement in Children Ages Five to Twelve. University of Maryland; 2008.

19. Block ME. Developmental trends in perceiving affordances: A preliminary investigation of jumping. In: Clark JE, Humprey JH, editors. Development: Research and Reviews. Reston: NASPE; 2002. p.142-162.

20. Rochat P. Perceived reachability for self and for others by 3- to 5-year-old children and adults. J Exp Child Psychol 1995;59(2):317–33.

21. Barnett LM, Ridgers ND, Salmon J. Associations between young children's perceived and actual ball skill competence and physical activity. J Sci Med Sport 2015;18(2):167–71.

22. Spessato BC, Gabbard C, Robinson L, Valentini NC. Body mass index, perceived and actual physical competence: The relationship among young children. Child Care Health Dev 2013;39(6):845–50.

23. Weiss MR, Amorose a. J. Children's self-perceptions in the physical domain: Between- and within-age variability in level, accuracy, and sources of perceived competence. J Sport Exerc Psychol 2005;27:226–44.

24. Fliers EA, de Hoog MLA, Franke B, Faraone S V, Rommelse NNJ, Buitelaar JK, et al. Actual Motor Performance and Self-Perceived Motor Competence in Children With Attention-Deficit Hyperactivity Disorder Compared With Healthy Siblings and Peers. J Dev Behav Pediatr 2010;31(1):35-40.

25. Valentini NC, Coutinho MC, Pansera SM, Santos VAP dos, Vieira JLL, Ramalho MH, et al. Prevalence of motor deficits and developmental coordination disorders in children from South Brazil. Rev Paul Pediatr 2012;30(3):377–384.

26. Spessato BC, Gabbard C, Valentini N, Rudisill M. Gender differences in Brazilian children's fundamental movement skill performance. Early Child Dev Care 2013;183(7):916–923.

27. Almeida G De, Valentini NCNC, Berleze A. Percepções de Competência : Um Estudo com Crianças e Adolescentes do Ensino Fundamental. Movimento 2009;15(1):71-79.

28. Neuendorf KA. The Content Analysis Guidebook. Chigaco: Sage; 2002.

29. Valentini NC. Validity and Reliability of the TGMD-2 for Brazilian Children. J Mot Behav 2012;44(4):275-280.

30. Hinkle DE, Wiersma W, Jurs SG. Applied Statistics for the Behavioral Sciences. 5. ed. Boston: Wadsworth Publishing; 2002.

31. Revelle, W. Using the psych package to generate and test structural models. Package, p. 1–45, 2011.

32. Souza MC, Berleze A, Valentini NC. Efeitos de um programa de educação pelo esporte no domínio das habilidades motoras fundamentais e especializadas: ênfase na dança. Rev Educ Fís/UEM 2008;19(4):509-519.

33. Valentini NC, Rudisill ME. Goal orientation and mastery climate : a review of contemporary research and insights to intervention. Estud Psicol 2006;23(2):159-172.

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