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ORIGINAL RESEARCH

Prevalence of Motor Competence in Chilean Schoolchildren and Its Association With Sex, Age, and Weight Status: The CoMoSur Study

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Background: Chile is one of the countries with the lowest indicators of children's physical activity therefore it is necessary to promote the development of factors that encourage regular practice, such as motor competence (MC), which is considered a fundamental factor in improving physical activity trajectories in school-age children. This CoMoSur study aimed to determine the prevalence of MC in fifth- and sixth-grade primary school children in central-southern Chile and analyze the association of MC with sex, age, and weight status. ***Methods:*** The MC of 1513 schoolchildren (49.4% girls; mean = 11.12 y, SD = 0.92) from 7 regions of central-southern Chile was assessed using the MOBAK 5-6 test. Confirmatory factor analyses and structural equation models were applied to test 2 models: (1) the factorial validity of the 2 dimensions of MC (object control and self-movement) and (2) the associations of MC with sex, age, and weight status. ***Results:*** Low levels of MC were observed, especially in girls. Model 1 showed adequate fit indices ($\chi^2 = 64.912$, df = 19, $P \leq .001$, CFI = .975, TLI = .963, RMSEA = .040, SRMR = .035). Model 2 also presented satisfactory fit ($\chi^2 = 161.97$, df = 37, $P \leq .001$, CFI = .943, TLI = .920, RMSEA = .047, SRMR = .071), revealing significant associations: sex is associated with both object control and self-movement, age was positively related to both MC dimensions, and higher weight status was negatively associated with MC. ***Conclusions:*** The MC levels in Chilean schoolchildren are concerning, underlining the urgency of implementing intervention programs to strengthen motor competencies. Such strategies should consider differences in sex, age, and weight status to promote sustainable trajectories of physical activity from childhood onward.

Keywords: motor skills, motor development, physical education, physical literacy

Key Points

- Chilean schoolchildren exhibited low motor competence levels, particularly among girls.
- Motor competence was positively associated with age and negatively associated with higher weight status.
- The results underscore the urgent need for interventions targeting motor competence development that consider differences in sex, age, and weight to foster positive physical activity trajectories.

The multiple benefits of physical activity (PA) on children's health are supported by robust scientific evidence[1,2]; however, the number of children and adolescents who comply with PA recommendations is very low.[3] Among the countries participating in Global Matrix 4.0, Chile has one of the lowest PA indicators.[3] Local studies have confirmed this trend, with the percentage of children and adolescents who meet the recommendations of at least 60 minutes of moderate to vigorous PA per day ranging from 3.7% to 29.8%.[4–6] Therefore, actions must be implemented to promote factors that encourage PA among children.[7] Among these factors, motor competence (MC) is prominent, described as a person's ability to perform fundamental motor skills,[8] which are regarded as the "building blocks" for more advanced and complex movements.[9]

MC is recognized as a fundamental element in promoting PA trajectories in school-aged children.[10,11] Several studies have supported a positive relationship between MC and PA,[7,10] confirming that children with high levels of MC are more active than their peers during childhood,[5,12,13] a trend that continues into adolescence and

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adulthood.[14–16] Therefore, MC plays a key role in the development of positive health trajectories.[11,17]

Despite the importance of MC in promoting PA in children, suboptimal MC levels, ranging from 9% to 52%, in children and adolescents have been reported by several international studies.[18,19] A similar trend has been noted in Chile, where, despite nascent research into MC and limited evidence, school children exhibit poor levels of MC particularly those aged 10–12 years,[20,21] a condition that deteriorated after the COVID-19 pandemic.[22] This situation is worrisome, as poor levels of MC and PA among schoolchildren make it difficult for them to acquire active behaviors that promote healthy lifestyles.[11] Insufficient levels of MC and PA, along with additional underlying factors such as perceived competence and health-related fitness, may precipitate a negative cycle that heightens the risk of unhealthy weight trajectories.[10,11]

MC development is influenced by many factors, with sex, age, and weight being the most relevant endogenous variables.[23,24] Despite boys and girls presenting with the same motor development milestones, biological sex is a determinant of motor performance, particularly in object-control-related motor tasks.[25–27] For tasks related to self-movement, the evidence is inconclusive, as some systematic reviews indicate that girls perform better than boys,[28] while others report no difference between the 2 sexes.[24] Evidence indicates that as children age, their MC increases; however, this favorable correlation between age and MC is attributable not only to inherent maturational processes but also to the diverse experiences and interactions children have with their environment.[17,29] Concerning weight status, several studies have shown a negative relationship between excess weight and MC.[30–32] It is common for children who are overweight or those with obesity to present greater difficulties in performing fundamental locomotor skills than their peers with normal weight.[10]

Although studies on MC have increased significantly in recent years,[33] most studies addressing the prevalence of MC have used small sample sizes across different age ranges and applied various forms of assessment, which complicates accurate and generalizable estimates of the actual prevalence of MC levels.[18] In the Chilean context, MC research is in its early stages and remains limited, characterized by the use of small, geographically limited samples particularly in the fifth and sixth grades which correspond to the final years of primary education in Chile. This age range, approximately 10–12 years old, is considered a critical stage for motor development, during which substantial growth and refinement of motor skills occur, making it an important period to assess and support MC.[29] To address this issue and provide evidence for a better understanding of MC among Chilean schoolchildren, the CoMoSur study (*Competencia Motriz en el Sur* or Motor Competence in the South) was conducted. This study included the central and southern regions of Chile and examined the association between MC and endogenous variables in one of the largest samples in Latin America. Overall, the main objectives were to: (1) determine the prevalence of MC in fifth- and sixth-grade primary school students in central and southern Chile and (2) analyze the association between MC and the endogenous variables of sex, age, and weight status in this population.

Methods

Study Design and Participants

The CoMoSur is a cross-sectional study conducted between 2021 and 2024 in 7 regions of Chile. A network of scholars with expertise in motor development was established to encompass this extensive geographical area, comprising Chilean universities located in each region involved in this study. Each academic representative from the region coordinated local logistics of the study. The CIAM Physical Literacy Research Centre (Centro de Investigación en Alfabetización Motriz) of the Universidad de La Frontera in Temuco City led the study and was responsible for its management, administration, and coordination with the network of academic researchers.

Given the large geographical area covered by the CoMoSur study, each region, through its local academic representatives, managed the sample using convenience cluster sampling. Eighteen educational centers (9 public, 6 subsidized, and 3 private) located in urban areas of the 7 participating regions were recruited. A total of 1513 schoolchildren participated in the study (49.4% were girls; age mean = 11.12 y, SD = 0.92). The inclusion criteria were being in the fifth and sixth years of primary school, not having repeated a year, and not having any diagnosed health conditions that would prevent them from participating in PA. Although participation in the study was open to all children, those with disabilities, or special needs did not participate.

Research Ethics Approval

The project was submitted to the Research Department of Universidad de La Frontera and underwent a double-anonymous peer review process. It was approved in early 2021 (project code: DFP21-0007). The study protocol was evaluated and approved by the Scientific Ethics Committee of the Universidad de La Frontera (file no. 088_21). Parents or guardians authorized their children to participate in the study by signing an informed consent form. Each child also expressed their voluntary intention to participate in the study through informed assent. The CoMoSur study has followed the "Guidelines for the Ethical Evaluation of Research in Social Sciences and Humanities involving and conducted with People" of the National Research and Development Agency of Chile[34] as well as the ethical standards stipulated in the Declaration of Helsinki.

Assessments

The MOBAK 5-6 test was used to assess MC,[35] which was validated in the Chilean school population.[20,36] This instrument was specifically designed to assess MC in fifth- and sixth-grade primary school students aged 10–12 years. The test consists of 8 motor tasks distributed across 2 dimensions: object control, which refers to manipulation skills (throwing, catching, bouncing, and dribbling), and self-movement, which includes locomotor (rolling, jumping, and running) and stability skills (balancing). Each task was scored on a scale of 0 to 2 points, depending on the number of successful attempts (never passed = 0 points, passed once = 1 point; passed twice = 2 points), except for throwing and catching, where each child made 6 consecutive attempts, resulting in a score equivalent to the other tasks (0–2 successful attempts = 0 points, 3–4 successful attempts = 1 point, and 5–6 successful attempts = 2 points). The sum of the scores obtained in the respective tasks determined the total score per dimension, which ranged from a minimum of 0 to a maximum of 8. Regarding the scores and their interpretation in each dimension, the following ranges are used for categorization[37,38]: 0 to 2 points = need of support, 3 to 4 points = needs improvement, 5 to 6 points = good performance, and 7 to 8 points = above average. The MOBAK 5-6 test demonstrated adequate fit and reliability in samples of boys and girls in Chile.[20,39]

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Body mass index (BMI) was used to assess weight status and was calculated using the following formula: weight/height squared (in kilograms per square meter). Weight was determined using a Seca model 803 scale, with an accuracy of 0.1 kg and a maximum capacity of 150 kg. Height was measured using a Seca model 217 stadiometer, with an accuracy of 1 mm. Measurements were performed with bare feet and as little clothing as possible, following the anthropometric assessment recommendations of Chile's National Board of School Aid and Scholarships.[40] The World Health Organization classification was used to determine nutritional status, considering specific parameters for each age and sex. These classifications correspond to thinness (–2 SD), normal (between −2 SD and +1 SD), overweight (between +1 SD and +2 SD), and obesity (above +2 SD).[41]

Procedure

To standardize the assessment processes, a network of academic researchers conducted online meetings to achieve a consensus on the data collection procedure. This procedure consisted of 2 phases: (1) presentation of the study to those involved (school authorities, parents and guardians of students, physical education teachers, and schoolchildren), to obtain the necessary authorizations (permission to conduct assessments in schools and informed consent and assent) and (2) preparation and administration of assessments, which entailed coordinating with physical education instructors to schedule assessments, training regional teams of evaluators and accompanying them during initial assessments, administering the evaluations, tabulating data, and transmitting results along with consent and assent forms to the CIAM Physical Literacy Research Centre.

Each academic representative led phase 1 in its entirety from their region, whereas phase 2 was undertaken collaboratively with the study leaders. CIAM Physical Literacy Research Centre researchers visited each region to train local evaluators and accompanied them during their first evaluations. In addition to training in the measurement protocol, local evaluators observed and evaluated a series of reference videos, in which children performed the MOBAK tests with varying levels of performance. Their ratings were compared with those of expert trainers, and only those who achieved a high degree of agreement (85% agreement) with the expert scores were recruited as trained raters and allowed to collect data in the study. Each local team then continued with their own assessments, which were conducted during each school's physical education classes (usually in the morning). The assessments lasted between 60 and 90 minutes.

Statistical Analysis

IBM SPSS version 25 was used for descriptive statistical calculations (median and 95% CI). Independent *t* tests (for the variable sex) and a 1-way analysis of variance (for the variables age and weight status) were conducted to examine differences between groups with respect to the 2 dimensions of MC (object control and self-movement). Effect sizes were calculated using Cohen *d* and eta squared (η^2) to determine the magnitude of the differences observed in the *t* tests and analysis of variance, respectively. The effect sizes were interpreted according to Cohen guidelines[42]: small ($d = 0.20$), medium ($d = 0.50$), or large ($d = 0.80$) for Cohen's *d* and small ($\eta^2 \geq .01$), medium ($\eta^2 \geq .06$), and large ($\eta^2 \geq .14$) for eta squared.

To analyze the associations established with the objectives of this study, an analysis was performed using confirmatory factor analysis and structural equation models with Mplus statistics software version 8.1.[43] Two models were specified: model 1, comprising 2 latent factors (object control and self-movement) designed to confirm the factorial structure of the MOBAK test, and model 2, which incorporated the MOBAK structure along with the endogenous covariates of sex, age, and BMI. In both models, the MOBAK instrument items were treated as ordinal variables using the weighted least squares means and variances estimator, which is appropriate for this type of data because it does not require the assumption of multivariate normality. To evaluate the adequacy of the model fit, the comparative fit index (CFI), Tucker–Lewis index (TLI), standardized root mean squared residual (SRMR), and root mean square error of approximation (RMSEA) were used, considering values above .90 for CFI and TLI, below .06 for the RMSEA, and below .80 for SRMR as indicators of a good fit.[44–46] Factor loads above .45 were considered acceptable.[47]

Results

Table 1 presents the descriptive statistics for MC according to sex. Significant differences were identified in object-control dimension,

Table 1 Descriptive Results of the Items and MC Dimensions of Object Control and Self-Movement, According to Sex

	Boys (n = 766)		Girls (n = 747)				
	Mean	95% CI	Mean	95% CI	*t*	*P*	*d*
Throwing[a]	0.47	0.43–0.51	0.33	0.29–0.36	4.793	≤.001	0.241
Catching[a]	0.65	0.60–0.71	0.21	0.17–0.25	12.881	≤.001	0.657
Bouncing[a]	1.34	1.28–1.39	0.94	0.88–1.00	9.344	≤.001	0.486
Dribbling[a]	1.07	1.01–1.13	0.61	0.56–0.67	11.556	≤.001	0.596
Object control[b]	**3.53**	**3.39–3.67**	**2.09**	**1.97–2.22**	**15.104**	**≤.001**	**0.776**
Balancing[a]	0.76	0.70–0.82	0.81	0.75–0.87	1.131	.258	0.060
Rolling[a]	0.49	0.43–0.54	0.44	0.39–0.50	1.101	.271	0.065
Jumping[a]	0.22	0.18–0.26	0.42	0.37–0.47	5.881	≤.001	0.308
Running[a]	0.88	0.82–0.94	0.88	0.82–0.94	0.071	.943	0.000
Self-movement[b]	**2.35**	**2.21–2.49**	**2.55**	**2.40–2.71**	**1.877**	**.061**	**0.097**

Abbreviation: MC, motor competence.
[a]Range of 0–2 points. [b]Range of 0–8 points.

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where boys (mean = 3.53) achieved significantly higher scores than girls (mean = 2.09, $P \leq .009$, $d = 0.776$). Conversely, in the self-movement dimension, although girls (mean = 2.55) performed slightly better than boys (mean = 2.35), the difference was not statistically significant ($P = .061$). Based on the interpretation of the obtained scores, boys fall within the "needs improvement" range in object control, whereas girls are categorized under the "need of support" classification. For the self-movement dimension, both boys and girls are classified within the "need of support" category.

Table 2 presents the descriptive statistics by age group, showing that MC values increase with age. In the object-control dimension, the group under 132 months exhibited the lowest values (mean = 2.46). These values were statistically different ($P = \leq.001$, $\eta^2 = .033$) when compared with the groups aged 132 to 144 months (mean = 3.08) and over 144 months (mean = 3.33). No significant differences were observed between the 132 to 144 months and over 144 months groups. Similar findings were obtained in the self-movement dimension, where the under 132 months group showed the lowest values (mean = 1.95), which also differed statistically ($P = \leq.001$, $\eta^2 = .570$) from the 132 to 144 months (mean = 2.82) and over 144 months (mean = 3.14) groups. No significant differences were found between the 132 to 144 months and over 144 months groups. When categorizing motor performance according to reference values, schoolchildren under 132 months of age fall within the "need of support" range for object control, whereas those aged 144 months and above are classified in the "needs improvement" range. Regarding the self-movement dimension, children younger than 144 months are also in the "need of support" category, while schoolchildren aged 144 months and older are placed in the "needs improvement" range.

Table 3 presents the descriptive statistics for MC by weight status, revealing a downward trend as BMI increases. In the object-control dimension, students in the thinness group exhibited the highest values (mean = 3.14); however, due to the small sample size (n = 7), these results should be interpreted with caution. Children in the normal category demonstrated higher scores (mean = 3.05) than those in the overweight (mean = 2.82) and obesity (mean = 2.60) groups, although post hoc analyses revealed statistically significant differences only between the normal and obesity groups ($P = .003$, $\eta^2 = .009$). A similar pattern was found in the self-movement dimension, with the normal group displaying the highest scores (mean = 3.29), followed by thinness (mean = 3.00), overweight (mean = 2.58), and obesity (mean = 1.52) groups. Significant differences were observed between the normal and overweight groups, the normal and obesity groups, and the overweight and obesity groups ($P \leq .001$, $\eta^2 = .132$). When interpreting the scores obtained from the theoretical categorization of MOBAK 5-6, overweight and obese schoolchildren fall within the "need of support" range across both dimensions, whereas those categorized as thinness and normal are classified within the "needs improvement" range.

The confirmatory factor analysis used to confirm the 2-factor structure of the MOBAK 5-6 test (model 1) is shown in Figure 1. The results showed good indices of fit ($\chi^2 = 64.912$, $df = 19$, $P \leq .001$, CFI = .975, TLI = .963, RMSEA = .040, SRMR = .035), with factor loadings between 0.46 and 0.73 and statistically significant correlations in all 8 items.

Figure 2 shows the structural equation model incorporating the bifactorial structure of the MC, considering the endogenous variables of sex, age, and BMI as covariates (model 2). A good fit was obtained according to the modeled indices ($\chi^2 = 161.97$, $df = 37$, $P \leq .001$, CFI = .943, TLI = .920, RMSEA = .047, SRMR = .071). Significant associations were observed for all the endogenous variables. Concerning sex (0 = boy, 1 = girl), an association was found between object control ($\beta = -0.46$, $P < .05$) and self-movement ($\beta = 0.08$, $P < .05$). In terms of age, a significant association was observed in both object control ($\beta = 0.21$, $P < .05$) and self-movement ($\beta = 0.31$, $P < .05$). Regarding weight status as represented by BMI, a significant negative association was identified in object control ($\beta = -0.11$, $P < .05$) and self-movement ($\beta = -0.47$, $P < .05$).

Discussion

The main objectives of the CoMoSur study were to determine the prevalence of MC in fifth- and sixth-grade primary school students in central and southern Chile and analyze the association of MC with the endogenous variables of sex, age, and weight status in this school population.

Table 2 Descriptive Results of the Items and MC Dimensions of Object Control and Self-Movement, According to Age

	a		b		c					
	<132 mo (n = 737)		≤132 to 144 mo (n = 546)		>144 mo (n = 230)					
	Mean	95% CI	Mean	95% CI	Mean	95% CI	*F*	*P*	η^2[b]	Significance between
Throwing[a]	0.31	0.28–0.35	0.47	0.41–0.52	0.50	0.42–0.59	15.047	≤.001	.020	a and b, a and c
Catching[a]	0.34	0.29–0.39	0.52	0.46–0.59	0.53	0.43–0.63	13.201	≤.001	.017	a and b, a and c
Bouncing[a]	1.03	0.97–1.10	1.21	1.14–1.27	1.33	1.23–1.43	13.183	≤.001	.017	a and b, a and c
Dribbling[a]	0.77	0.71–0.83	0.89	0.82–0.96	0.97	0.87–1.08	7.059	≤.001	.009	a and b, a and c
Object control[b]	**2.46**	**2.32–2.60**	**3.08**	**2.91–3.25**	**3.33**	**3.09–3.58**	25.38	≤.001	.033	a and b, a and c
Balancing[a]	0.66	0.60–0.71	0.89	0.82–0.96	0.95	0.83–1.06	17.944	≤.001	.023	a and b, a and c
Rolling[a]	0.37	0.32–0.42	0.56	0.50–0.63	0.53	0.43–0.64	10.726	≤.001	.014	a and b, a and c
Jumping[a]	0.19	0.15–0.23	0.38	0.32–0.44	0.57	0.47–0.68	35.209	≤.001	.045	a and b, a and c, b and c
Running[a]	0.73	0.67–0.79	0.99	0.92–1.06	1.09	0.98–1.19	23.302	≤.001	.030	a and b, a and c
Self-movement[b]	**1.95**	**1.82–2.09**	**2.82**	**2.64–3.00**	**3.14**	**2.86–3.42**	45.794	≤.001	.570	a and b, a and c

Abbreviation: MC, motor competence.
[a]Range of 0–2 points. [b]Range of 0–8 points.

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Table 3 Descriptive Results of the Items and MC Dimensions of Object Control and Self-Movement, According to Weight Status

	a		b		c		d					
	Thinness (n = 7)		Normal (n = 523)		Overweigh (n = 439)		Obesity (n = 541)					
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	*F*	*P*	η^b	Significance between
Throwing[a]	0.57	0.08–1.07	0.44	0.39–0.50	0.38	0.33–0.44	0.36	0.32–0.41	1.959	.118	.004	None
Catching[a]	0.00	0.00–0.00	0.43	0.37–0.50	0.44	0.37–0.50	0.44	0.38–0.50	0.899	.441	.002	None
Bouncing[a]	1.43	0.70–2.16	1.23	1.16–1.30	1.18	1.10–1.25	1.03	0.95–1.10	5.904	≤.001	.012	b and d, c and d
Dribbling[a]	1.14	1.31–1.97	0.94	0.87–1.01	0.83	0.75–0.90	0.77	0.70–0.84	4.551	.004	.009	b and d
Object control[b]	**3.14**	**3.14–1.90**	**3.05**	**2.88–3.22**	**2.82**	**2.64–3.01**	**2.60**	**2.43–2.77**	4.635	.003	.009	b and d
Balancing[a]	0.71	0.17–1.59	1.06	0.99–1.13	0.85	0.77–0.93	0.47	0.41–0.53	50.005	≤.001	.091	b and c, b and d, c and d
Rolling[a]	0.71	0.02–1.41	0.71	0.64–0.79	0.48	0.41–0.55	0.22	0.17–0.26	39.589	≤.001	.073	b and c, b and d, c and d
Jumping[a]	0.71	0.02–1.41	0.50	0.44–0.57	0.32	0.26–0.38	0.13	0.09–0.17	31.27	≤.001	.590	b and c, b and d, c and d
Running[a]	0.86	0.03–1.69	1.01	0.94–1.09	0.93	0.85–1.01	0.71	0.64–0.78	12.782	≤.001	.025	b and d, c and d
Self-movement[b]	**3.00**	**0.86–5.14**	**3.29**	**3.11–3.47**	**2.58**	**2.39–2.78**	**1.52**	**1.39–1.66**	76.022	≤.001	.132	b and c, b and d, c and d

Abbreviation: MC, motor competence.
[a]Range of 0–2 points. [2]Range of 0–8 points.

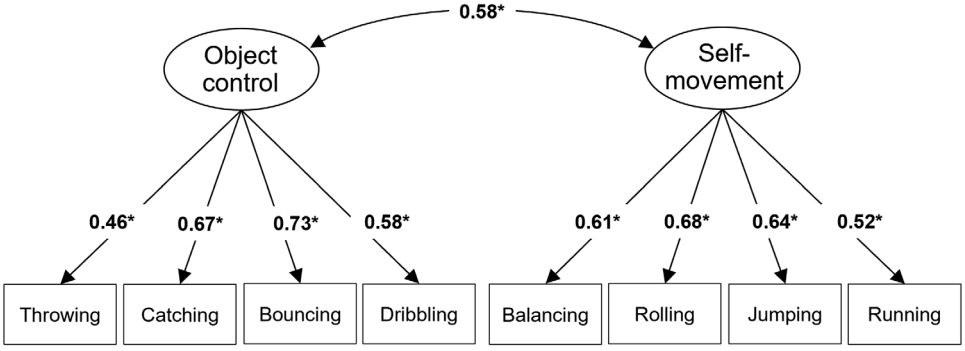


Figure 1 — Association between the MC dimensions of object control and self-movement, and their respective items (model 1). MC indicates motor competence. $^*P < .05$.

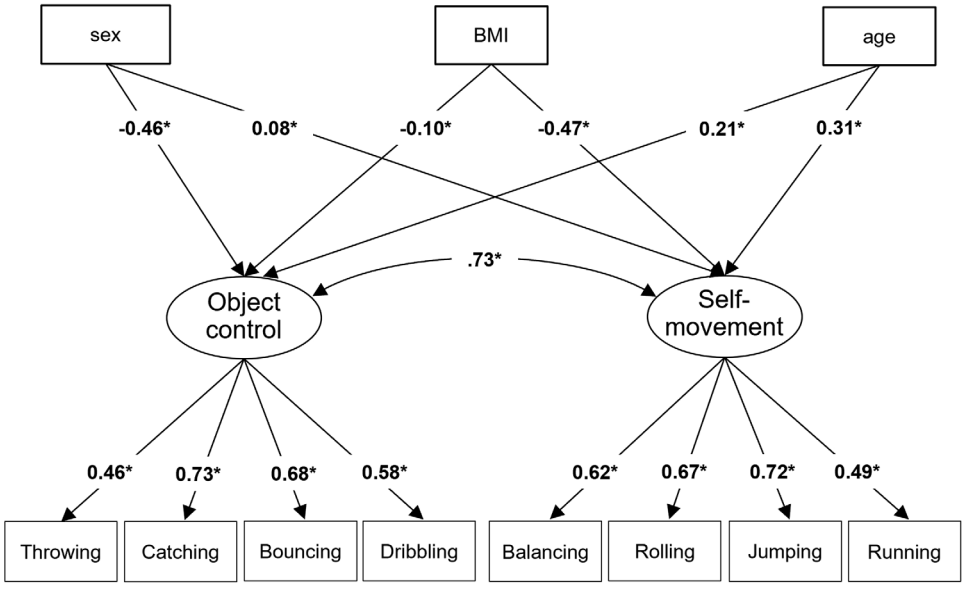


Figure 2 — Associations between the MC dimensions of object control and self-movement with the endogenous variables sex (coded 0 = boys, 1 = girls), BMI, and age (model 2). BMI indicates body mass index; MC, motor competence. $^*P < .05$.

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With regard to the first objective, the results showed that fifth- and sixth-grade students in central and southern Chile have poor MC levels, as the performance of girls and boys falls between the theoretical levels of "needs improvement."[37] A comparative analysis of MC between boys and girls revealed significant advantages for boys in the object-control dimension, corroborating findings from various systematic reviews.[24,28] Conversely, no statistically significant differences were observed in the self-movement dimension, which is consistent with the findings of studies examined in Barnett's systematic review.[24] These findings could be attributed to the influence of gender stereotypes,[48] particularly regarding the opportunities typically organized for schoolchildren. Boys not only have access to a broader range of sports than girls, but they also predominantly engage in ball sports, whereas the options available to girls are mainly limited to activities such as dance.[49] In this context, an intervention designed to develop object-control skills in a sex-equitable manner achieved significant improvements in MC, in addition to contributing to the reduction of deeply rooted stereotypes without showing differentiated effects according to biological sex.[50] It is important for future research, not only locally but also globally, to continue to delve more deeply into interventions with a sex-equality focus, incorporating families and other relevant actors involved in children's education.

With regard to age, the results of this study are consistent with several systematic reviews that have demonstrated a positive relationship between MC and chronological age,[24,28] indicating that age is one of the primary determinants of MC in children, with older children tending to exhibit better motor skills than their younger peers.[51] From an ecological perspective, Haywood and Getchell[17] emphasize that older children display enhanced motor skills due to both maturation and developmental factors, as well as experiences acquired through interaction with their environment. In this context, a study involving Irish schoolchildren reported a significant correlation between biological maturation and rotational stability skills but no significant association between biological maturation and other motor skills.[52] The same study also revealed that many participants demonstrated delayed motor performance, indicating that the anticipated improvement with age was not as pronounced. According to Philpott et al,[52] this finding may be attributable to contextual factors, such as low levels of PA participation, limited opportunities, and changes within the school environment. Accordingly, results from the CoMoSur study suggest that sixth-grade children outperform their fifth-grade peers not only because they are chronologically older but also because they have had greater exposure to motor experiences, including more physical education classes, as an additional year of schooling affords increased opportunities to participate in organized physical activities.

The results related to weight status showed significant differences, with outcomes tending to worsen among schoolchildren classified as overweight and obese, revealing a downward trend as BMI increases. The accumulation of body fat is believed to adversely affect motor performance owing to increased body mass, which complicates self-movement, particularly in activities requiring mobility and stability.[30,53,54] These findings confirm that children with a healthy weight excel in motor activities and are more adept at developing MC. In contrast, overweight children typically exhibit inferior self-movement, which impedes their performance in activities that assess MC. The CoMoSur study highlighted the risk of exacerbating high rates of childhood overweight and obesity among Chilean schoolchildren.[55] The low MC levels reported by the CoMoSur, in addition to the prevalence of physical inactivity among Chilean schoolchildren[4–6] can create a detrimental cycle that promotes excess weight and low MC and PA levels.[11]

A comparison of the results of the CoMoSur study with international research that used the MOBAK 5-6 battery to assess MC revealed that the performance of Chilean schoolchildren is considerably lower than that of their German counterparts, who achieve higher averages in both object control and self-movement.[13,35,56] From a local perspective, an analysis of the data revealed that the performance of children in the CoMoSur study was inferior to the results found in pre- and post-COVID-19 pandemic studies, particularly when juxtaposed with the sparse research on MC in Chilean schools.[20–22] In a study conducted at the end of the COVID-19 pandemic comparing MC in pre- and postlockdown cohorts of Chilean schoolchildren in the fifth and sixth grades of primary school, declines in motor performance were reported in both object control (from mean = 3.4 prelockdown to mean = 3.0 postlockdown) and self-movement (from mean = 2.8 prelockdown to mean = 2.35 postlockdown).[22] The already low MC values indicate a notable loss in motor performance, especially in self-movement tasks, potentially attributable to prolonged confinement and the resulting school closures[22]; it remains to be established why, after several years, there has still been no recovery in motor performance. However, previous studies examined much smaller samples and were limited to 1 region of Chile; thus, MC levels must be monitored to determine whether this is a downward trend. The evidence presented by the CoMoSur study serves as a wake-up call to implement measures such as ongoing monitoring MC, the creation of programs that promote MC, and a stronger emphasis on developing MC as a learning objective in physical education classes.

Regarding the second objective, which sought to analyze the association of MC with the endogenous variables of sex, age, and weight status, structural equation model revealed associations between the 2 MC dimensions and the covariates of sex, age, and BMI. Covariate sex was significantly associated with object control, with boys outperforming girls, whereas in self-movement, girls showed higher competence than boys. Many studies have documented that boys tend to outperform girls in motor tasks associated with object control,[24,25,28] whereas in self-movement, the evidence is unclear, as some studies indicate that there are no sex associations in this dimension,[24] and others report associations where girls exhibit higher MC than boys.[28] With regard to the covariate age, significant associations were observed in both MC dimensions, favoring older children, which aligns with the findings of other studies confirming age as a determinant of MC.[18] Various studies have shown a positive associations between MC and chronological age,[24,28] which can be attributed not only to natural growth and maturation processes but also to the aggregation of motor experiences gained through engagement with the environment.[17]

In terms of weight status, a significant negative association was identified between BMI and both MC dimensions, which is consistent with existing evidence documenting an inverse relationship between weight status and MC.[10] Although this association, proposed in the theoretical model by Stodden et al,[11] has been widely discussed, a systematic review compiling longitudinal and experimental evidence has confirmed the bidirectional negative association between MC and BMI.[10] Moreover, robust evidence indicates that a healthy weight status is associated with greater MC and improved physical fitness.[10] These findings underscore the importance of addressing body weight in interventions aimed at promoting PA among children and adolescents.

The CoMoSur study has limitations that must be considered when interpreting and extrapolating the results. Although this study

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included one of the largest samples of MC in the Chilean school population, covering almost half of the country's regions, the use of convenience sampling limits its national representativeness. Furthermore, the lack of representative data from all regions makes direct comparisons difficult. For future research, it is suggested that more representative samples be used and that the sample size be expanded by region, incorporating both urban and rural populations. Likewise, to gain a deeper understanding of the factors that explain the results, it would be useful to incorporate more comprehensive information on the participants' sociocultural backgrounds. Another limitation of the present study is the lack of information on PA levels in boys and girls, which would have provided a better understanding of the associations between MC and its key correlates. Future studies should include direct assessments of PA using accelerometry or, if unavailable, validated self-report methods. Nonetheless, it is important to recognize the various strengths of the CoMoSur studies. The main strength of this study lies in the simultaneous and generalized assessment of MC in 7 of Chile's 16 regions. Using the same standardized procedures, equipment, and instruments, the assessment of MC covering this wide geographical area involved a coordinated effort by academics from different universities, generating valuable information that will serve as evidence for decision making in campaigns that seek to promote PA. Moreover, given the substantial sample size, the CoMoSur study's findings enhance the current understanding of MC as it addresses an internationally underrepresented demographic, signifying a significant advancement in sports science research in Chile and Latin America. Another notable strength is that the MC assessment tool, the MOBAK 5-6 test, is aligned with the Chilean physical education curriculum and learning objectives[36] and has been robustly validated within the Chilean school population.[20] Moreover, due to its applicability, cost-effectiveness, and simplicity it offers physical education teachers a practical alternative for evaluating their students and comparing their results with those of this study. This will facilitate the integration of scientific results into educational practices aimed at promoting the development of MC and regular PA among Chile's children.

In conclusion, the CoMoSur study provides valuable data on the MC of Chilean schoolchildren, addressing a population that is underrepresented in global research. The findings reveal low levels of MC among fifth- and sixth-grade students in the central and southern regions of the country. Moreover, the study highlights significant sex disparities, age-related differences, and inverse associations with weight status, thereby contributing to a more comprehensive understanding of the factors influencing MC in this population. These results underscore the need to implement national strategies that ensure equitable access to quality motor experiences and strengthen the pedagogical emphasis on MC development within physical education classes.

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