Association Between Motor Skills and Attention in School-Aged Children: A Sex-Based Analysis

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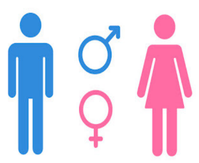
INTRODUCTION

Evidence suggests that motor and attentional skills might be developmentally interlocked.[1,2] Although it is unclear how fine motor skills contribute to attention, it is argued that when children execute a fine motor task that is enjoyable for them, they fully engage and focus their attention during the task.



This association, however, may differ between boys and girls due to variation in motor and attentional skills between them (e.g., girls shows lower performance than boys in locomotor, but outperform boys in attentional skills)

The role of sex in the relationships between motor and attentional skills, however, remained unknown.

OBJECTIVE

Therefore, the current study investigated how the association between motor skills and attentional skills in school-aged children differ between boys and girls after controlling for earlier vocabulary, numeracy, and visuospatial skills and key demographics (i.e., family income and educational attainment of mothers).

METHODS

Participants

The Quebec Longitudinal Study of Child Development **(QLSCD)** is based on a representative birth cohort of more than 1500 children born in the province of Quebec, Canada in 1998.

Instruments

Attentional skills

- Evaluated by teachers
- Sum of three items: listening carefully, being easily distracted and inattentive child (r=.88)

Fine motor skills

- Evaluated by teachers
- Sum of two items: proficiency at holding a pen, crayons, and a brush, and their ability to manipulate objects (r= .85).

Object control

- Standardized scale
- Subtests: two-hand striking, stationary bouncing, catching, kicking, and overhand throwing.

Locomotor

- Standardized scale
- Subtests: running, galloping, hopping, leaping, horizontal jumping, skipping, and sliding.

Procedure

- Attentional skills assessed at 7 years old and motor skills assessed at 6 years old were included into the analysis.

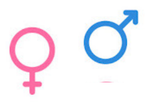
Analyses

Multiple regression analyses were done to measure the association of attentional skills at 7 years old with sex and motor skills at 6 years old after controlling for family income, educational attainment, preschool receptive vocabulary, visuospatial organization, and number knowledge, and sex-based effects on the association between motor skills and attentional skills were measured by computing interactions between sex with each motor skills. The interactions between sex and each motor skills were tested using the macro-PROCESS for SPSS.

RESULTS

Table. The mean and standard deviation or frequency distribution (n, %)

	Female (n=432)	Male (n=395)	p value
Predictors			
Fine motor	4.53±.61	4.26 ±.70	<.001
Locomotor	36.42±6.10	35.38±6.50	.001
Object control	29.14±6.60	33.34±6.60	<.001
Outcomes			
Attentional skills	8.69±2.12	7.73±2.18	<.001

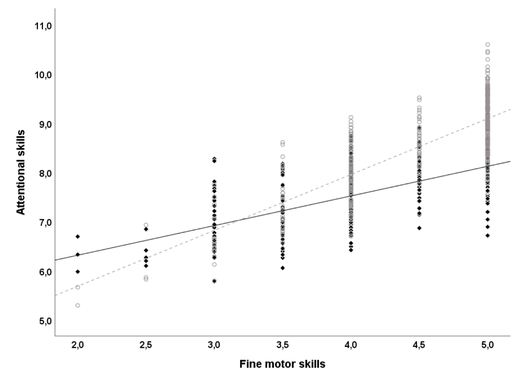


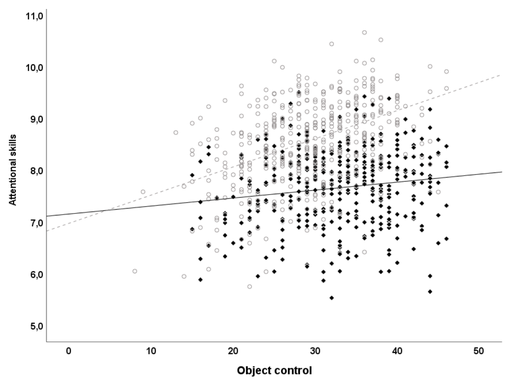
Sex was significantly related to attentional skills (β=.11, p<.001).

Fine motor skills of both girls and boys predicted their attentional skills, but this association was stronger in girls.

A significant interaction between sex and object-control revealed a prediction to attentional skills for girls (p=.024), but not for boys (p=.492)

Locomotor (β=.10, p=.009) significantly predicted attentional skills. No differences between boys and girls.





DISCUSSION

This study showed that fine motor and object control skills matters more for girls in the prediction of attentional skills than for boys. Majority of the girls in this study scored at their age-appropriate level at object control subtest while most boys performed lower than their expected performance level. Thus, it might be that girls already improved their attentional skills through reaching their maturity at object control, while boys are still in the process of improving their attentional skills. Moreover, it might be that fine motor activities are less appealing to boys than girls, which may lead boys to engage in less, and sustain less attention during these activities.

REFERENCES

Sobe, 2004; Stewart et al., 2007