Can cognitive performance predict physical fitness and academic achievement one year later?

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BACKGROUND

Previous studies have shown that physical activity, fitness and academic achievement might predict **cognitive performance** later in life. However, to the best of our knowledge, there are no studies examining the inverse relationship, that is, whether cognition may predict **fitness** and **academic achievement** in adolescents one year later. Therefore, the aim of this study was to examine the associations between cognitive performance and physical fitness and academic achievement one year later.

METHODS

This study includes baseline and one-year follow-up longitudinal data of cognitive performance, fitness and academic achievement. A total of **131 adolescents** (aged range: 12 to 13) from South Spain participated in our study. Cognitive performance was assessed using the **Raven's Progressive Matrices test** (non-verbal test). Cardiorespiratory fitness was measured by **20 m endurance shuttle-run**. Lower-limbs muscular strength was assessed by the **standing long jump test**. Flexibility was assessed by the **sit-and-reach test**. Academic achievement was assessed using the **grades** obtained in Language, Mathematics, English (foreign language) and Geography and History. Cognitive performance was collected in October 2015, while fitness and academic achievement were evaluated one year later (October 2016). Linear regression analyses were performed.

RESULTS

Our results indicate that **cognitive performance was not associated** neither with **cardiorespiratory fitness** (ß=0.109, p=0.254), nor **muscular strength** (ß=0.155, p=0.104), or **flexibility** (ß=0.080, p=0.406) one year later. Regarding academic achievement, **cognitive performance was positively associated** to **Mathematics**, **Language**, **Geography and History** and **English** achievements one year later (see **Table 1**).

Table 1. Associations of cognitive performance with academic achievement one year later

Mathematics	ß=0.482	p<0.001
Language	ß=0.407	p<0.001
Geography and History	ß=0.454	p<0.001
English	ß=0.382	p<0.001

CONCLUSIONS

Overall, our results **suggest** that **cognitive performance might predict academic achievement** but **not fitness one year later**. Further studies with a randomized controlled design should contrast or corroborate our findings in young people.

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