

The influence of recreational gymnastics at 4 to 6 years of age on physical activity levels at 8 to 10 years of age.



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Introduction

- Physical activity (PA) has known health benefits for children and adults.^{4, 6, 7, 13}
- Studies suggest that habitual childhood PA may influence adult levels of PA^{2,10} and fitness^{12, 14} in adulthood.
- Early involvement in sport has shown significant tracking across childhood⁹, adolescence and into early adulthood.⁸
- What is unknown is whether early childhood involvement in specific sports benefits PA levels in later childhood.

Purpose

To examine if early involvement in recreational gymnastics influences levels of PA in later childhood

Methods

Participants

- 91 gymnasts and 72 non-gymnasts from the University of Saskatchewan's Young Recreational Gymnasts Study (YRGS) studied between 2006 and 2012

Statistical method

- Average PA scores were compared between groups and time points (independent t-test and repeated measures ANOVA) ($\alpha = 0.05$).

Measures

- Participants were assessed annually.
- PA was assessed using the Netherlands Physical Activity Questionnaire; response range from 7 (low physical activity) to 35 (high physical activity).



Results

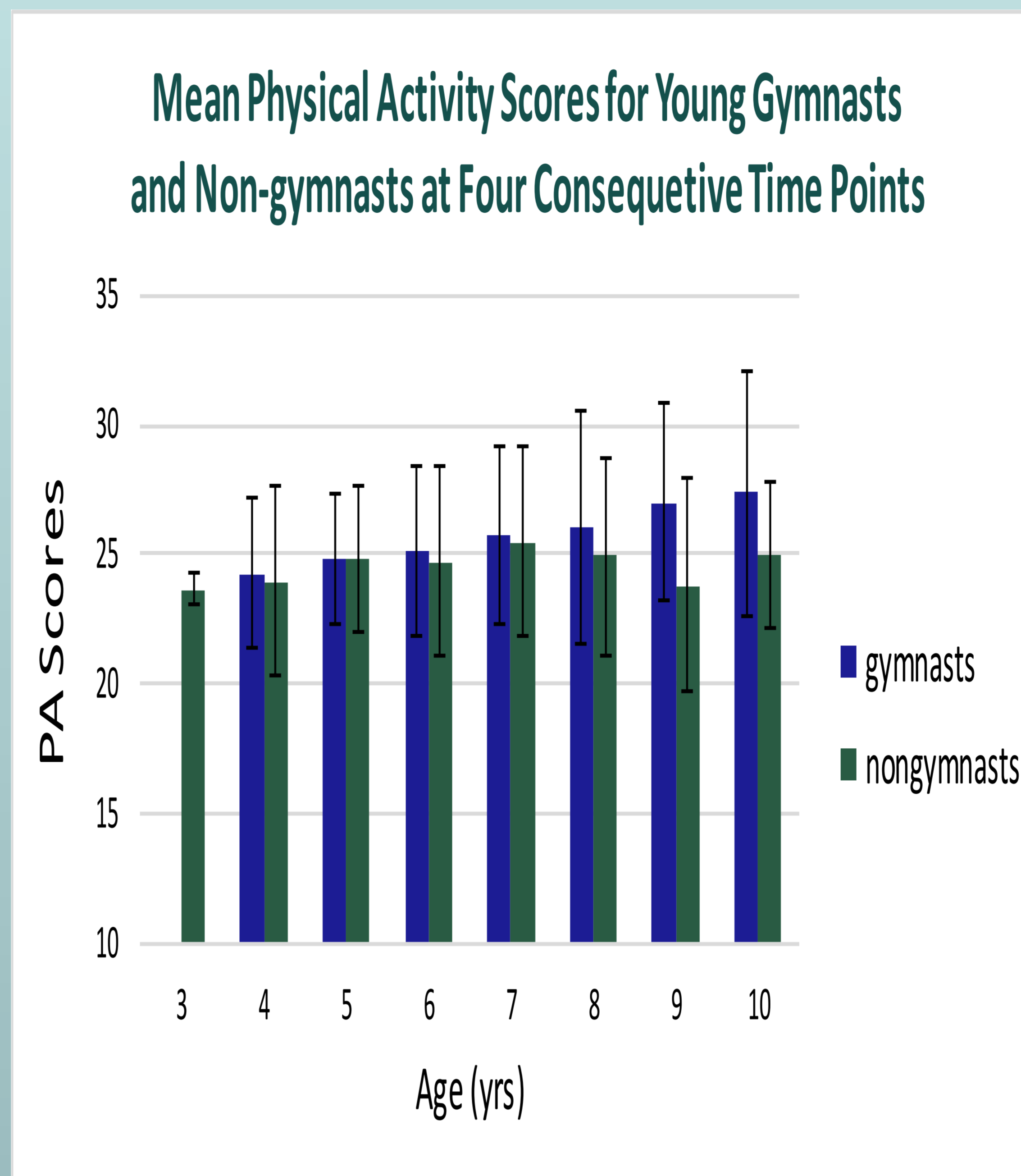


Figure : Physical activity scores (7 low; 35 high) of young gymnasts and non-gymnasts by age

- No significant difference were found in PA scores between gymnasts (25.0 ± 3.0) and non-gymnasts (24.5 ± 3.4) ($p > 0.05$).
- Weak correlation between age and PA ($r = 0.12$, $p > 0.05$).
- PA increased in both groups across the four year measurement period ($p < 0.05$), however; there was no significant time by group interaction ($p > 0.05$).

Discussion

- In contrast to previous studies^{1,3,5} our data found no decrease in PA with age
- Absence of a PA decline may be due to the young age of participants. We have previously shown PA declines between 10 and 17 years in Saskatchewan youth.¹¹
- Differences between gymnasts and non-gymnasts may not be salient until the adolescent decline in PA begins .
- PA levels reported for this study are inclusive and therefore total levels of PA in late childhood reflect the influence of participation in other sports and activities for both gymnasts and non-gymnasts.
- The nature of the relationship between early childhood involvement in gymnastics and later childhood PA remains unclear. In order to clarify this relationship, further follow-up of this cohort is warranted.

Conclusions

This study found no difference in PA scores between young gymnasts and non-gymnasts suggesting that early involvement in gymnastics does not improve later childhood levels of PA. This does not discount the possibility of differences occurring during adolescence

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References

- Department of Health, Physical Activity, Health Improvement and Prevention (2004). At least five a week: Evidence on the impact of physical activity and its relationship to health. London: Department of Health.
- Erlandson, M. C., Sherar, L. B., Mosewich, A. D., Kowalski, K. C., Bailey, D. A., & Baxter-Jones, A. D. (2011). Does controlling for biological maturity improve physical activity tracking? *Medicine and Science in Sports and Exercise*, 43(5), 800-807. doi:10.1249/MSS.0b013e3181f8e8a; 10.1249/MSS.0b013e3181f8e8a
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., & Lancet Physical Activity Series Working Group. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *Lancet*, 380(9838), 247-257. doi:10.1016/S0140-6736(12)60646-1; 10.1016/S0140-6736(12)60646-1
- Janssen, I., & Leblanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *The International Journal of Behavioral Nutrition and Physical Activity*, 7, 40-5808-7-40. doi:10.1186/1479-5808-7-40; 10.1186/1479-5808-7-40
- Malm, R. M., Bouchard, C., Bar-Or, O. Growth, Maturation and Physical Activity. 2nd ed. Chicago (IL): Human Kinetics; 2004. p. 470-4.
- Myers, J., Kaykha, A., George, S., Abella, J., Zaheer, N., Lear, S., & Froelicher, V. (2004). Fitness versus physical activity patterns in predicting mortality in men. *The American Journal of Medicine*, 117(12), 912-918. doi:10.1016/j.amjmed.2004.06.047
- Oguma, Y., & Shinoda-Tagawa, T. (2004). Physical activity decreases cardiovascular disease risk in women: Review and meta-analysis. *American Journal of Preventive Medicine*, 26(5), 407-418. doi:10.1016/j.amepre.2004.02.007
- Richards, R., Williams, S., Poulton, R., & Reeder, A. I. (2007). Tracking club sport participation from childhood to early adulthood. *Research Quarterly for Exercise and Sport*, 78(5), 413-419
- Telama, R., Leskinen, E., & Yang, X. (1996). Stability of habitual physical activity and sport participation: A longitudinal tracking study. *Scandinavian Journal of Medicine & Science in Sports*, 6(6), 371-378.
- Telama, R., Yang, X., Viikari, J., Valimaki, I., Waane, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine*, 28(3), 267-273. doi:10.1016/j.amepre.2004.12.003
- Thompson, A.M., Baxter-Jones, A.D.G., Mirwald, R.L., Bailey, D.A. (2003). Comparison of physical activity levels in male and female children using chronological and biological ages. *Medicine and Science in Sports and Exercise*, 35(10):1684-1690
- Twisk, J. W. R., Kemper, H. C. G., & van Mechelen, W. (2000). Tracking of activity and fitness and the relationship with cardiovascular disease risk factors. *Medicine and Science in Sports & Exercise*, 32(8), 1455-1461.
- Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801-809.
- Van Oort, C. C., Jackowski, S. A., Eisenmann, J. C., Sherar, L. B., Bailey, D. A., Mirwald, R. R., & Baxter-Jones, A. G. (2013). Tracking of aerobic fitness from adolescence to mid-adulthood. *Annals Of Human Biology*, 40(6), 547-553