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Systematic review and evidence appraisal of objectively assessed longitudinal changes in moderate-to-vigorous physical activity among children and adolescents (2-18 years old)

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INTRODUCTION

- Moderate-to-vigorous physical activity (MVPA) during childhood is positively associated with bone strength, cardio-respiratory fitness, blood pressure, lipid profile and insulin sensitivity during adolescence.
- However, there is sporadic data showing MVPA declines as early as during preadolescence.
- There is a need for tracking change in physical activity specifically MVPA throughout childhood and adolescence.

OBJECTIVE

The aim of this study was to systematically review accelerometer based longitudinal studies which have quantified year to year changes in moderate-to-vigorous physical activity (MVPA) among the general paediatric population in the absence of any intervention.

METHODS

- Databases:** Medline, Embase, ProQuest, SPORTDiscus, Physical Education Index, Web of Science up to May 2016.
- Type of studies:** Longitudinal studies, cohort studies and randomised controlled trials.
- Domain being studied:** Objectively measured physical activity to assess MVPA.
- Population:** Children and adolescents (aged 2 to 18 years).
- Inclusion criteria:** To be eligible, the studies must have reported MVPA (minutes/day) at least twice, after at least 1 year intervals following the baseline measures.
- Exclusion criteria:** We excluded studies which used subjective measures of MVPA, studies of clinical populations and populations in which an intervention was applied.
- Analysis:** A pooled mean at each age level was determined and where possible the data were extracted separately by gender. Percentage change from baseline or previous measurement was computed in order to account for the variety of accelerometer cut-offs used for defining MVPA across studies.

RESULTS

Figure 1. A flowchart of study selection process

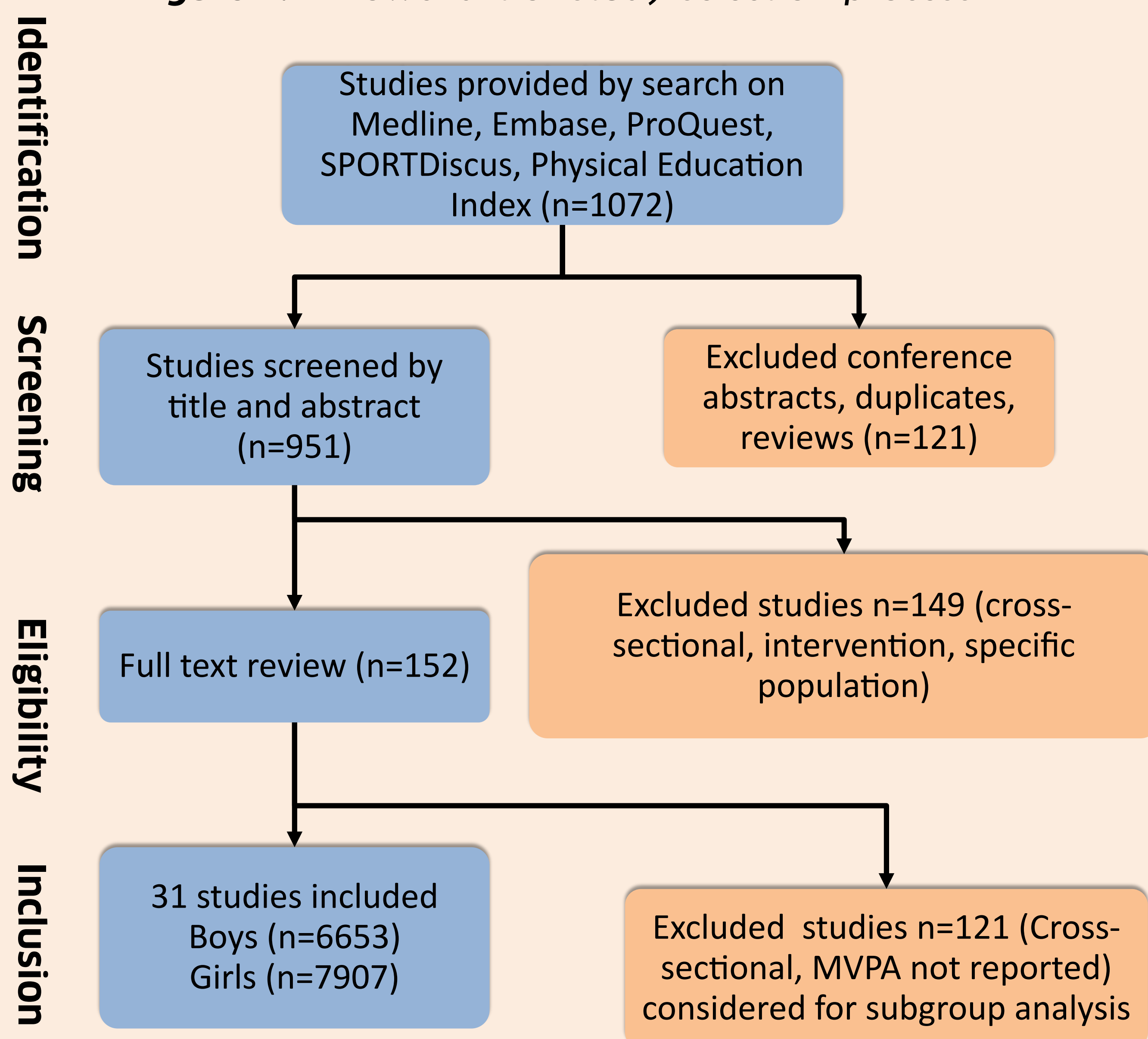


Figure 3. Percentage of annual decline in MVPA (min/day) in boys and girls by age

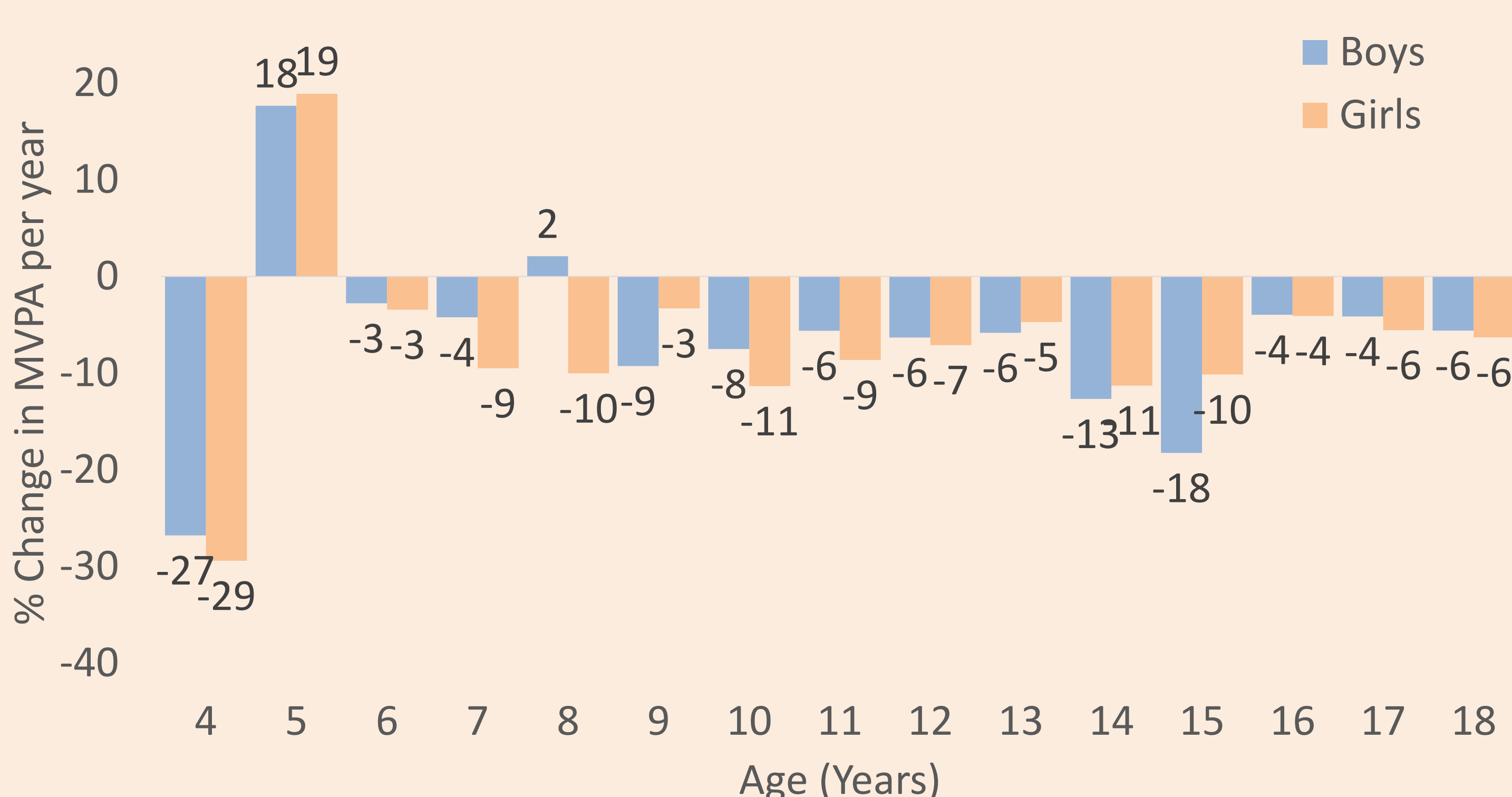
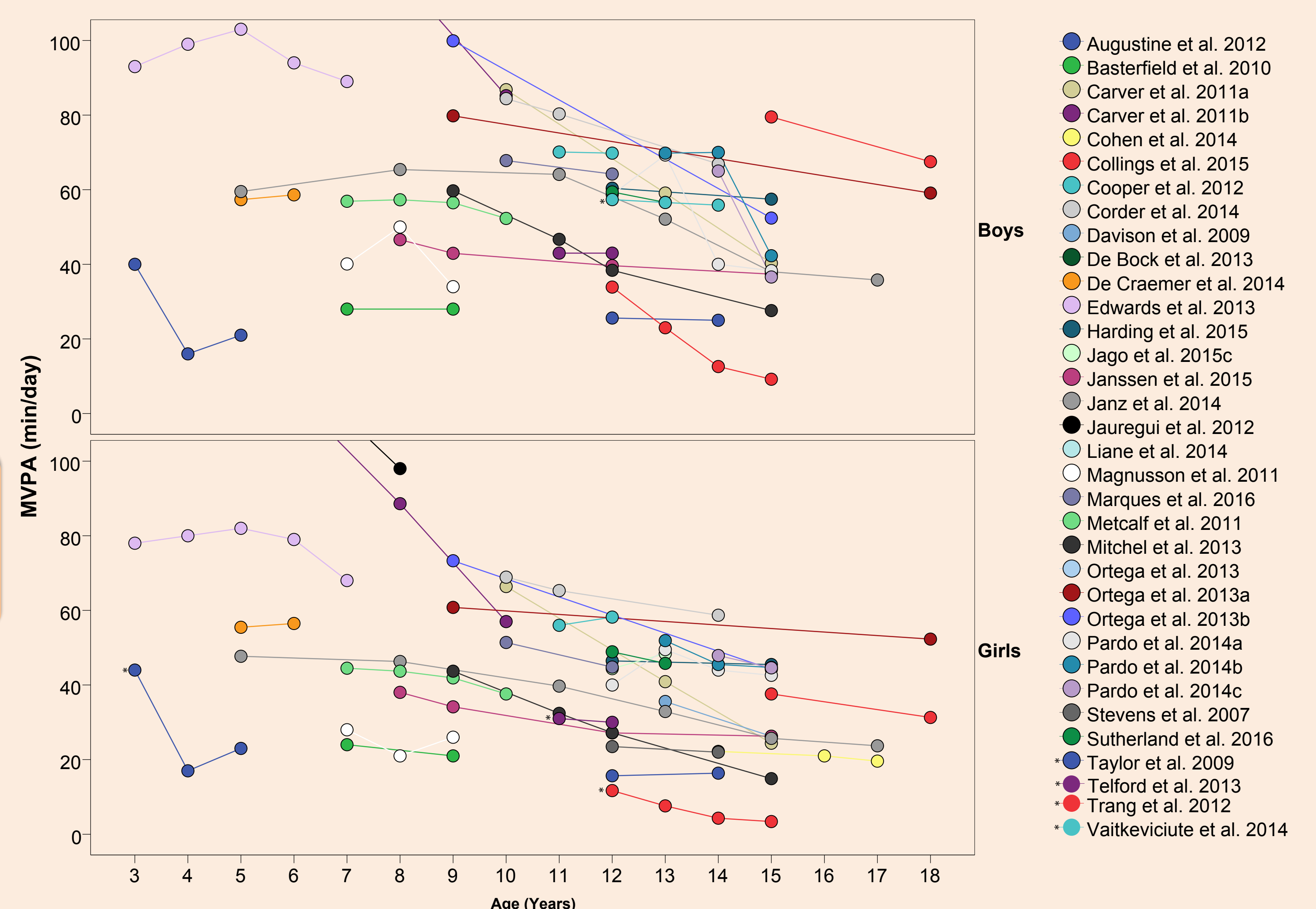


Figure 2. Mean moderate-to-vigorous physical activity MVPA (min/day) in boys and girls by age



CONCLUSION:

- There is unfailing decline in MVPA across all ages from most recent studies as well as previous studies that have used accelerometers.
- The annual percentage decline in MVPA was observed consistently among girls through ages 7-11.
- Boys show sudden as well as much higher rates of annual decline in MVPA after 13 years.
- There are insufficient studies to support the trajectory for children 16 and above.