Reviewer's report

Title: Relationship of physical fitness with memory and attention in preschoolers: A cross-sectional and longitudinal study ("Ballabeina")

Version: 1 Date: 2 February 2011

Reviewer: Keita Kamijo

Reviewer's report:

This study investigated the relationship between physical fitness (aerobic fitness, agility, and dynamic balance) and cognitive function (working memory and attention) in preschool children using cross-sectional and longitudinal analyses. Results indicated that aerobic fitness and agility were positively associated with cognitive function in the cross-sectional analyses. Further, longitudinal analyses showed that greater aerobic fitness at baseline resulted in greater improvement in the attentional score, and superior dynamic balance at baseline resulted in greater improvement in the working memory score. Accordingly, the authors concluded that higher fitness is associated with improvements in working memory and attentional functions.

In general, this study is well designed and carried out. The authors’ effort to collect a large sample should be praised. Nevertheless, this reviewer has several concerns especially about the introduction.

1. The authors stated that previous studies in children showed mixed results (Page 5). But the authors only described some limitations in previous studies (Page 6). The authors should review more details about the mixed findings in previous studies. That is, the authors should indicate why the mixed findings were observed. In doing so, the purpose and originality of the present study would become more clearly.

2. In this connection, the authors’ hypotheses are mere guesses (Page 6). This reviewer cannot follow why the authors made these hypotheses. Hypotheses should be made based on previous findings.

3. It is unclear why the authors focused on spatial working memory and attention. This should be described more clearly in the introduction.

4. The cognitive tasks should be explained in more details (Page 8-9). This reviewer cannot understand the cognitive tasks.

5. In several parts of the discussion, the authors merely indicated whether the current results are consonant with previous findings. The authors should focus on what are the important findings in the current study. It is difficult to follow the authors’ contentions.

Minor points
Page 8-9, the working memory task should be described before the attention task.

Page 13, “by Hillman et al.” should be “by Hillman and his colleagues”.

Tables, n (sample size) should be indicated in italics.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.