Reviewer's report

Title: Trends in screen-time behaviours and moderate-to-vigorous physical activity among German adolescents 2002-2010

Version: Date: 14 January 2014

Reviewer: Carol Maher

Reviewer's report:

Overall impression
In general, this is a well written study with appropriate analyses, which makes the most of the data available from the HSBC study. It is a major flaw that video gaming was not measured in the latter waves of the HSBC survey, and thus was not included in screen time calculations in this study. As the authors comment in the discussion, this is likely to have underestimated screentime, and particularly in boys, who are well known to have much higher gaming time than girls. For this reason, I think it is most important that throughout the paper, the authors qualify the term "screentime" (ST). I would favour avoiding this term, which implies total screentime, which you do not have. Rather, I would try to refer to "TV" and "non-gaming PC use". I think you should qualify in the methods that videogaming was not gathered so the reader is clearer of this from the outset rather than discovering it in the discussion (which many readers will overlook, unless they read the manuscript in its entirety). I also think it is important that this is clarified in the title and abstract, hence some of my comments below.

Compulsory revisions

1. Title. you are not presenting trends in total screentime (since gaming behaviour is not included). I believe it is important this is clear in the title. Suggest changing it to "Trends in television time, non-gaming computer behaviours and moderate-to-vigorous physical activity among German adolescents 2002-2010"

2. Abstract
I think it should be clear in the methods of the abstract that time trends in computer and console gaming were not examined.

Minor essential revisions

1. Abstract: Recommended not using the acronym FAS for family affluence. It is not common, and makes it hard for the reader. In general, I would prefer this manuscript to use far fewer acronyms.

2. How much did MVPA increase? please add numbers to the results in the abstract to make this meaningful.

3. This sentence is confusing: Interactions " showed that the degree of change over time varied but there was no variation in the direction of change". I have no
idea what this means. I would recommend removing the sentence on interactions from the abstract, since they didn't show clear patterns.

4. background: I wouldn't say that reviews published in 2005 and 2009 are "recent". Suggest reword.

5. "Recent findings on total screen time using data from 2000 to 2010 among adolescents found a decrease in TV viewing that was replaced by an increase in PC use. This increase was steeper in girls. The overall time using screens remains about the same over these ten years [15]." These sentences could do with some additional referencing, and clarification - it is only when I look at the reference list, I see you are talking about a Czech study. At first I thought you might have been referring to the findings of your own study!

6. End of background: It is unconventional to phrase your research aims as hypotheses, without stating the aims first. I would prefer to see them written as aims.

7. Methods: with this sentence "The sample was slightly reduced due to missing values in physical activity, sedentary behaviours as well as covariates (range between 5.0 [PC weekday] and 7.3 [TV weekend day])." what does the part in parentheses mean? (range between 5.0 [PC weekday] and 7.3 [TV weekend day])."

8. typo: adolescentst

9. "This question was developed by Prochaska et al. [22] and in a slightly modified version asking in addition “how many days in a typical week”. This sentence is grammatically incorrect. Please address.

10. "For this version test-retest stability [22- 23] and validity in terms of substantial correlations with accelerometers was shown [22, 24]. Due to the limited space in the HBSC survey and high correlation between activity in the “past 7 days” and “a typical week”, only the “past week” item was used in 2005/06 and 2009/10." Please provide the reliability and validity coefficients.

11. I would like further detail on the family affluence scale. Who completes it? How is the scale scored? What is the evidence that it is valid?

12. Analysis: what was the relationship between MVPA and ST? Should these variables be treated as potential confounders in the models (e.g. the MVPA analyses should be adjusted for ST and vice versa?)

13. Discussion:
The sentence is grammatically incorrect: "In 2002 the question did not list “homework” but list in an unspecific way to use the computer for playing."

I am a bit confused. You wrote: "We did not have trend information about time playing games on a computer or games console because this differentiated information have been used since 2006." does this mean data on computer and
console gaming was available in the 2006 and 2010 waves of HSBC? If so, you could report time trends. Please clarify.

Minor discretionary changes
1. Methods: confounders: surprising to see age used as a categorical variable rather than continuous. Why was it done this way, and would it change findings?

2. Discussion: explanation of increasing PC use in lower socioeconomic status groups: You wrote "One explanation for this might be that in the last decade PC use has shifted away from academic to more social purposes leading to higher participation among all groups of socioeconomic background". An alternative explanation may be that PC have become increasingly affordable over the past decade.

3. There seems to be an over-emphasis on comparisons to Czech data, to the exclusion of other European countries. I would like to see a more balanced mix of countries included in the discussion (or perhaps add an explanation as to why Czech comparisons are more relevant that other countries).

4. You could consider commenting that while combined non-gaming PC time and TV time remained constant (or increased in girls ) the slight decline in TV viewing is promising, given that television time but not computer use is associated with unfavourable health behaviours such as snacking and exposure to food advertising.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
'I declare that I have no competing interests'