

## **Title**

I suggest some minor changes in the title in order to understand that the “active commuting to and from school” is examined. I would put “Relationship between the average slope in the active commuting to and from school and fitness in adolescents: the mediator role of fatness”

## **Abstract**

Given the aim of the study was to examine the relationships between the average slope in the active commuting to and from school and the strength of the lower limbs and maximal oxygen uptake (VO<sub>2</sub>max), it would be advisable to change the previous sentence of the aim. For example, “Active commuting to and from school has been recognized as a potential way to improve physical fitness”.

I would suggest changing “the aims of the study tested the” for “This study examined the relationships between...”

I would suggest changing “active commuting to school” for “active commuting to and from school”

I would suggest changing “showed a positive association between the average slope” for “showed a positive association between the average slope in the active commuting to and from school”

Set a point before moreover (i.e., Moreover the results shown a significant indirect effect in the two models).

I would suggest changing “These results are very relevant, as, till now, no studies were found using objective measurements of active commuting like Google Earth Pro software” for “Given to our knowledge, no studies to date have used objective measurements to assess active commuting to and from school, these findings are promising”

Please, rewrite the conclusions. From my point of view, the conclusion are “The average slope to and from school were positive associated...” instead of “Adolescents who actively commuted to school were positive associated with...”

I suggest adding the word “body mass index” or “body fat”, “walking” o “cycling” in the keywords.

## **Introduction**

I would suggest changing “active commuting to school” for “active commuting to and from school” throughout the manuscript.

Given the aim of the study was to examine the relationships between the average slope in the active commuting to and from school and the strength of the lower limbs and maximal oxygen uptake (VO<sub>2</sub>max), it would be advisable to add in this sentence physical fitness “Active forms of transportation have been recognized as potential ways to increase daily physical activity, providing an alternative to other physical activity

domains such as sport and exercise (Heath et al., 2012; Sahlqvist, Song, & Ogilvie, 2012). In addition, I would put “active commuting to and from school” instead of “active forms of transportation” given the context of the study.

For example “Active commuting to and from school have been recognized as potential way to increase daily physical activity or improve physical fitness among adolescents”

I would suggest reading and adding these references in this sentence and throughout the manuscript.

Larouche, R., Saunders, T. J., Faulkner, G. E. J., Colley, R., & Tremblay, M. (2014). Associations between active school transport and physical activity, body composition, and cardiovascular fitness: a systematic review of 68 studies. *Journal of Physical Activity and Health*, 11(1), 206-227.

Martin, A., Kelly, P., Boyle, J., Corlett, F., & Reilly, J. J. (2016). Contribution of walking to school to individual and population moderate-vigorous intensity physical activity: systematic review and meta-analysis. *Pediatric exercise science*, 28(3), 353-363.

I would suggest changing the order of some of the paragraphs in the introduction. I would put the following paragraph behind “Active commuting to and from school have been recognized as potential way to increase daily physical activity or improve physical fitness among adolescents”

*Previous research has shown that children and adolescents who actively commute to school increase their levels of physical activity between 5 and 37 minutes (Mammen et al., 2014). Andersen et al. (Lars Bo Andersen et al., 2011) tested the benefits of this increase in children, reporting lower levels of body fat and a lower probability of heart disease. In this regard, Ramírez-Vélez et al. (Ramírez-Vélez et al., 2017) showed that regular active commuting to school may be associated with greater fitness and a lower incidence of metabolic syndrome than using passive transportation, especially in girls. Along with the health risks commonly associated with obesity and overweight (Buckley, Lowry, Brown, & Barton, 2013), there is considerable scientific literature highlighting negative biomechanical changes such as developing unfavourable gait patterns and skeletal misalignments of the lower limbs (Buliung, Faulkner, Beesley, & Kennedy, 2011; Buliung, Mitra, & Faulkner, 2009; Chillón et al., 2011).*

I would suggest removing these two sentences “Moreover, walking may be perceived as an easier, safer, and cheaper option, especially for those who are less active. Walking is a more familiar activity, it does not require special equipment and is less likely to involve direct competition for road space with motorised traffic (Morris & Hardman, 1997).”

In the sentence “Different studies have indicated a decrease in the use of active modes of transportation to school during adolescence in many countries (USA, United Kingdom, Australia and Spain) (Chillón et al., 2013; Department for Transport, 2008)” I would suggest adding “Despite the well-known health benefits of active commuting to and from school, different studies have indicated a decrease in the use of active modes of transportation to school during adolescence in many countries (USA, United Kingdom, Australia and Spain) (Chillón et al., 2013; Department for Transport, 2008).

In the sentence “Interest in the influence of environmental factors on adolescents has increased in recent times (Adams et al., 2011; Sallis et al., 2016), valuing different aspects in order to categorize transport as active or inactive (Rodríguez-Rodríguez et al., 2019).” I would put “Due to this decrease, interest in the potential correlates of active commuting to and from school has increased in the last years”

I would suggest reading and adding these references:

Ikeda, E., Stewart, T., Garrett, N., Egli, V., Mandic, S., Hosking, J., ... & Moore, A. (2018). Built environment associates of active school travel in New Zealand children and youth: A systematic meta-analysis using individual participant data. *Journal of Transport & Health*, 9, 117-131.

Ikeda, E., Hinckson, E., Witten, K., & Smith, M. (2018). Associations of children's active school travel with perceptions of the physical environment and characteristics of the social environment: a systematic review. *Health & place*, 54, 118-131.

What sections do the authors refer to in this sentence? Which means a “higher positive slope”? How many meters are we talking about? Is there any study about the relationship of the average slope to active commuting to and from school and positive outcomes in youth?

*Recently, it has been shown that sections with a higher positive slope are characterized by producing internal mechanical work, involving greater muscular activity and increasing the linear energy demand (Ehrström et al., 2017; Vernillo et al., 2016).*

In the sentence “On the other hand, physical activity levels have been widely highlighted as a positive predictor of fitness and a negative predictor of fatness (Janssen & LeBlanc, 2010).” I would suggest adding this reference:

Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J. P., Janssen, I., ... & Sampson, M. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism*, 41(6), S197-S239.

There is a typographical error in this sentence. For example, **Serrano-Sánchez et al.** (**Serrano-Sánchez et al., 2010**) found that adiposity mediated the associations between physical activity and fitness in active adult men.

There is another typographical error in this sentence. “Additionally, **Arngrímsson and Ólafsdóttir** (**Arngrímsson & Ólafsdóttir, 2016**) demonstrated that % body fat mediated over a third of the relationship between physical activity and cardiorespiratory fitness in late adolescents”.

I would suggest being more cautious in this sentence (see red colour). However, **to our knowledge** there are not study that evaluated if adiposity could affect in the associations between active commuting and fitness components.

In the aims I would put “average slope to and from school”

In the hypotheses, I would put “average slope to and from school” instead of “the average slope during active commuting to the school”

In the hypotheses, I would put “...to achieve **higher** levels of cardiorespiratory fitness.”

## **Method**

### **Design and Participants**

Authors point out “The participants selected were those who enrolled in the Program to Promote Physical Activity and Healthy Habits in Adolescents”.

- Please put all words in lower case as it is not the name of a program.
- Was it a school-based intervention or a extracurricular intervention? Please, indicate in the text

Please, rephrase this sentence. “The present investigation was a cross-sectional by conglomerate”.

How many schools did the study sample come from?  
Please put “active commuters” instead of “active”.

Please put “final sample” instead of “reference sample”.

In the “design and participants” section, authors said “*For the analysis, only those students classified as Active (see Active Commuting p. 7) were taken as a reference sample*”. However, in the “instruments” section authors said “*The students’ classification according to the type and number of trips and distance to the school was: Active, Mixed, or Inactive (Mora-Gonzalez et al., 2017)*” Therefore, did only active commuters participate in this study? Please, clarify this issue.

### **Procedure**

Please put these four sentences together “*All gave their informed consent for inclusion before they participated in the study. ... Participation was voluntary and confidential. Written informed consent was obtained from parents and participants. Students who did not present the informed consent were excluded from the study*”

### **Instruments**

Authors point out “*The number of trips and the transportation mode used by students travel to and from school were calculated with two self-reported questions (Herrador-Colmenero, Pérez-García, Ruiz, & Chillón, 2014; Mora-Gonzalez et al., 2017; Muntaner-Mas et al., 2018; Saelens & Handy, 2008)*” What were those two questionnaires? There are four references.

Authors point out “*The first question asked how they habitually traveled to school and the second asked how they habitually returned from school.*” I would put (See red colour) “*The first question asked how they habitually traveled to school **each day of the***

*week (i.e., from Monday to Friday) and the second asked how they habitually returned from school each day of the week (i.e., from Monday to Friday)”*

Please, rephrase this sentence “A total of ten weekly trips were established if they reported walking to and from the institute and zero trips if they reported traveling by car, bus, or motorbike”

Please, put “Aerobic capacity” instead of “Aerobic Capacity”

Please, put “Active commuting” instead of “Active Commuting”.

Please, change the name of this study variable “***Classification as Active, Mixed, or Inactive.***”. For example, active commuter, mixed commuter, and passive commuter. Please change the name of this study variable throughout the article to avoid misunderstandings.

Covariates

Which is CRF and CA? Please, clarify it. In many parts of the text the authors use “active commuting” and in another sections “AC”. Please, unify this word.

## Results

Please, put “active commuters” instead of “active students” in this sentence “Table 1 shows the characteristics of body composition, fitness, and the active transportation to school of the active students”

Please, change “active subjects” for “active commuters”

In addition, authors said “*The students’ classification according to the type and number of trips and distance to the school was: Active, Mixed, or Inactive (Mora-Gonzalez et al., 2017)*” and “*These classification criteria were based on the findings of (Martínez-Gómez et al., 2011; Ruiz-Ariza, de la Torre-Cruz, Redecillas-Peiró, & Martínez-López, 2015; Villa-González, Ruiz, et al., 2016) (Figure 1)*” What is the reference for choosing these criteria from all of these studies? Please, clarify it.

Given that the authors excluded students who reported bicycling as an active means of transport, I wonder if it wouldn't be more precise put “walking to and from school” instead of “active commuting to and from school” throughout the manuscript.

Please rephrase this sentence. “*The results of the active subjects did not reveal significant differences between to sex for age, weight, subscapular fold, strength of the lower limb, number of trips/week, distance, time and average slope (all  $p > 0.05$ ).* Among which groups were there no differences in the study variables?”

Please add “significantly” in this sentence “However, the girls had significantly higher values of the tricipital folds, % body fat and VO<sub>2</sub>max than the boys (all  $p < 0.01$ ).

Put “between” instead of “netween”

Put “active, mixed and inactive commuters” instead of “active, mixed and inactive

groups”.

Please, put “participants” or “students” or “adolescents” instead of “subjects”

## Discussion

It is important to try to justify some of the results found in the discussion.

Please remove “during actively commuting to school” in the first hypothesis.

Please remove “when actively commuting” in the second hypothesis.

I would put “the average slope to and from school” instead of “the average slope during active commuting to the school”

In the figure 1, I would put “active commuter, mixed commuter, and passive commuter” instead of “active participants, etc.”

I would put “the average slope to and from school” instead of “the average slope covered”.

Please remove “when actively commuting to school” in this sentence “*To date, the present study is the first research that associates the average slope of the route **when actively commuting to school** with the physical and anthropometric characteristics of active adolescents.*”

There is a typographical error in this sentence “Chillón et al. (Chillón et al., 2011)”

Authors said “*The contributions of the present investigation contrast with most of the prior research collected in the review by Chillón et al. (Chillón et al., 2011; Muntaner-Mas et al., 2018), who confirmed that most investigations carried out to date have focused on using active commuting to school as a means of promoting physical activity, without evaluating the physical or anthropometric benefits that this could generate for the students*” Please, review this systematic review and reformulate this sentence.

Larouche, R., Saunders, T. J., Faulkner, G. E. J., Colley, R., & Tremblay, M. (2014). Associations between active school transport and physical activity, body composition, and cardiovascular fitness: a systematic review of 68 studies. *Journal of Physical Activity and Health*, 11(1), 206-227.

Please consider putting this paragraph in another section. For example, to highlight strengths of this study. “Several studies have pointed out the lack of objectivity and quantification of the instruments used in most research assessing active commuting (Batista et al., 2018; Chillón et al., 2011; Muntaner-Mas et al., 2018). Taking into account these limitations, we decided to use Google Earth Pro software, an instrument whose validity and reliability has been previously confirmed (Villa-González, Rodríguez-López, et al., 2016).”

Authors said “As far as we know, there is no obvious association between AC and cardiorespiratory fitness among children and adolescents (Villa-González et al., 2015).” Please, review this reference to reformulate this paragraph.

Larouche, R., Saunders, T. J., Faulkner, G. E. J., Colley, R., & Tremblay, M. (2014). Associations between active school transport and physical activity, body composition, and cardiovascular fitness: a systematic review of 68 studies. *Journal of Physical Activity and Health*, 11(1), 206-227.

There is a typographical error in this reference (L. B. Andersen, Lawlor, Cooper, Froberg, & Anderssen, 2009; Østergaard, Kolle, Steene-Johannessen, Anderssen, & Andersen, 2013).

There is a typographical error in this reference Villa-González et al. (Villa-González et al., 2015)

In this sentence “*In this regard, Villa-González et al. (Villa-González et al., 2015) were not able to find significant associations between AC and physical fitness variables such as cardiorespiratory fitness and lower muscular fitness for boys*” I would put “...were not found significant...”

Please, change “as a polluting variable” for “as a contaminating variable”

There are two sentences in the discussion section that are very similar “*In relation to these results, our study does not attempt to find differences between active, mixed and inactive groups, since it is more than demonstrated (Villa-González et al., 2015)*” and “*Taking into account the previous literature, this research does not intend to study the differences between active, mixed or inactive students*”. Please, reconsider remove one of them.

Please, reformulate this sentence “Taking into account the mediating effect of body fat on the association of the average slope with the strength lower limbs and average slope with VO2max”

In this sentence “*Therefore, our study concludes that the average slope presents a positive association between the levels of strength of the lower limbs and VO2máx of students classified as active. In addition, the mediating effect of body fat in the associations of the average slope with strenght lower limbs and the average slope with VO2máx.*” I would put “Therefore, the main finding of this study is that the average slope to and from school is positively associated with the levels of strength of the lower limbs and VO2máx of students classified as active commuters. In addition, the mediating effect of body fat in the associations of the average slope to and from school with strenght lower limbs and the average slope to and from school with VO2máx is another important finding”

In this sentence “The temporal stability of the habit of actively commuting was not assessed,” I would put “The temporal stability of active commuting to and from school...”

Please put a reference in this limitation “The temporal stability of the habit of actively commuting was not assessed, as it is subject to climatological variables that are very difficult to control, such as a prolonged period of rain, winter cold...”

For example, Herrador-Colmenero, M., Harrison, F., Villa-González, E., Rodríguez-López, C., Ortega, F. B., Ruiz, J. R., ... & Chillón, P. (2018). Longitudinal associations between weather, season, and mode of commuting to school among Spanish youths. *Scandinavian journal of medicine & science in sports*, 28(12), 2677-2685.

## **Conclusions**

Please, rewrite the conclusions. From my point of view, the conclusion are “The average slope to and from school were positive associated...” instead of “Adolescents who actively commuted to school were positive associated with...”

I would put “These results are promising because there are no studie to date that have examined the relationships of the study variables using and objective measurement of active commuting such as the Google Earth software” instead of “These results are very relevant because, to date, no studies were found that used an objective measurement of active commuting such as the Google Earth software.”