

eISSN: 2452-5812

<http://jmh.pucv.cl/>**Recibido:** 25/05/2022**Aceptado:** 21/06/2022**Disponible:** 28/06/2022**Publicado:** 01/07/2022

Original article

The permission for walking to school: An analysis from a gender perspective

El permiso para caminar hacia el colegio: un análisis desde la perspectiva de género

Herrador-Colmenero, M^{1,2}; Estévez-Piñeiro, P²; Saucedo-Araujo, RG²; Aranda-Balboa, MJ²; Girela-Rejón, MJ³

Correspondencia[✉]

PhD. Manuel Herrador-Colmenero

La Inmaculada Teacher Training Centre, University of Granada, 18071 Granada, Spain.

mhc@ugr.es

Abstract

Objective: The aims were to describe the permission patterns to walk to school alone, accompanied by other children or adults, according to the sex of the parents and the offspring, and to analyse the association between the sex of the parents and the sex of the offspring with the permission of them to walk to school alone, accompanied by an equal, or accompanied by an adult. **Methods:** A total of 149 families from Spain participated in this study. The families completed a questionnaire about sociodemographic data and age of permission to walk to school. Chi-square analyses were used to describe permission patterns, and binary logistic regression models were fitted to analyse the relationship between sex and permission to walk to school. **Results:** The results showed no association between the permission to walk alone, accompanied by equals or adults with to the sex of the parent or of the children (all, $p > 0.05$), except to walk to school accompanied by an adult in mothers of secondary school students (Odds Ratio: 4.9, $p < 0.05$). **Conclusion:** To conclude, permission patterns have been described, and no association has been observed between sex and permission patterns to walk to school.

Keywords: behaviour; education; adolescent; physical activity.

Resumen

Objetivo: Los objetivos de este estudio fueron describir los patrones de permiso para caminar al colegio solo, acompañado de otros niños o adultos de acuerdo con el sexo de los padres y de los hijos, y analizar la asociación entre el sexo de los padres y el sexo de los hijos con el permiso para caminar al colegio solo, acompañado de otros niños o de adultos. **Métodos:** Un total de 149 familias españolas participaron en el estudio. Las familias completaron un cuestionario sobre datos sociodemográficos y edad de permiso para caminar a la escuela. Análisis de chi-cuadrado fueron usados para describir los patrones de permiso y modelos de regresión logística binaria fueron ajustados para analizar la relación entre el sexo y permiso para caminar a la escuela. **Resultados:** Los resultados no mostraron asociación entre el permiso para caminar solo, acompañado por iguales o adultos con el sexo de los padres o de los hijos (todos, $p > 0,05$), excepto para caminar al colegio acompañado con adultos en madres de estudiantes de secundaria (Odds Ratio: 4,9, $p < 0,05$). **Conclusión:** Para concluir, se describieron los patrones de permiso y no se encontraron asociaciones entre el sexo y los patrones de permiso para caminar al colegio.

Palabras clave: comportamiento; educación; adolescente; actividad física.



Highlights

- No differences were found by sex in the permission to walk to school.
- Associations between permission to walk to school and the sex of parents and offspring were analysed.
- Gender perspectives should be considered when walking to school programs are proposed.

Introduction

Physical activity (PA) during childhood and adolescence is associated with numerous health benefits, such as healthy growth and development of the cardiorespiratory fitness, the musculoskeletal systems or it could develop social interactions, personal satisfaction, and mental well-being¹⁻⁴. For children and adolescents between 3 and 18 years old, the World Health Organization recommended achieving a minimum of 60 min/day in moderate-to-vigorous PA intensity⁵.

The use of active commuting to school, understood as the use of active modes such as walking or cycling to go and/or come back from school has been identified as an opportunity for children and adolescents to incorporate PA habits into their daily life⁶. It has been evidenced that children and adolescents who walk to school have higher levels of PA than those who commute by car⁷. For example, ten-year-old North American children who commuted actively to school increased their time in moderate or vigorous PA by around 24 min/day⁸. In addition, these participants aged between 7 and 19 years old who walked to school registered a higher number of steps, less sedentary time, and higher time of PA than those who used passive commuting⁹. However, while the use of active commuting remained stable for Spanish children and adolescents¹⁰, this behaviour has decreased in the last decades in different countries despite its health benefits for children and adolescents¹¹⁻¹³. The implementation of educational programmes and their adaptation to different socio-economic contexts might help to stop this trend¹⁰.

Active commuting behaviour is associated with children's and adolescents' freedom to move and play within their neighbourhoods¹⁴. This freedom to commute using different modes of transport without needing an adult accompaniment is called independent mobility. The routine of commuting actively and independently to and from school has been associated with various factors, such as demographic, personal, school, parental perceptions, environmental, and social¹⁵. Within the personal factors appears the gender, "masculine" and "feminine", which refers to a social construct with roles, norms and values considered appropriate for men and women of a given society or era¹⁶. On the other hand, we have sex as a biological category that distinguishes between "man/boy" and "woman/girl"¹⁷. There is evidence that boys have more possibilities to perform independent commuting than girls, so it could be considered gender as a determinant factor at the same time affects the active commuting to school^{18,19}.

The perception of fragile and needing protection women emerges strongly in the relationship with the built environment for boys and girls²⁰. There is a wide range of factors related to this phenomenon from childhood to adulthood, which is important to fight against the socially constructed idea of childhood and the general perception of girls' vulnerability in public space²¹. A systematic review focused on gender and city spaces observed that public space is not neutral²². There is a series of factors that limit women to relate to space in the same way as a man, being: fear of strangers, fear of the street and the public space in general, fear of going alone, guilt, linking the effects to personal attitudes (clothing, place, and time of transit), overvaluation and overprotection of the body, and sexuality of women²³. Moreover, women have been shown to perceive their environment as more insecure than men²⁴. The family is one of the elements that develop autonomy in young people. Some research has identified that the persistence in the mother of the traditional gender stereotypes is associated with the opportunity of their daughters to be autonomous^{25,26}. Although the family has undergone numerous changes, the family model continues, in

which the mother remains tied to the domestic and the education of her offspring to a greater extent than the father²².

To our knowledge, studies that analyse the relationship between independent mobility, family and sex in Spanish children and adolescents have not been conducted. Hence, the present study explores the relationship between the age of permission for walking to school with a different kind of accompaniment and sex, aiming 1) to describe the permission patterns to walk to the school alone, to walk accompanied by an equal (i.e., children and/or adolescents), or to walk accompanied by an adult (e.g., mother, father, grandparents, adult neighbours, etc.), according to the sex of parents and students, and 2) to analyse the association between the sex of the parents and the sex of the students with the permission of them to walk to school alone, to walk accompanied by an equal, or to walk accompanied by an adult.

Methods

Study design and participants

This cross-sectional study is part of the “Pedalea y Anda al COle: PACO” study (“Cycle and walk to school”). A total of 220 parents of students (parents age: 23-59 years old; student age: 10-17 years old) from two schools (i.e., one primary and one secondary school) from Alhendín (Granada, Spain) were invited to take part in the study. The data collection was performed in March 2018. To be included in the study, the parents or tutors must report complete data of personal data (i.e., age and sex of the parent/tutor and the student and postal address), family income, and age of permission to walk to school with different kinds of accompaniment. Finally, a sample of 149 parents was obtained because 71 were excluded for the following reasons (see figure 1): not to report personal data (n=27 did not report their own age, n=1 did not report their own sex, n=0 did not report the student age or sex, and n=4 did not report postal address), not to indicate the family income (n=17), and not to report the age of permission to walk to school (n=19). In addition, 3 participants were excluded because they were not the parents of the student (e.g., grandparents or brother/sister), representing a very small sample to be able to be analysed as "other relatives" (<2% of the total sample).

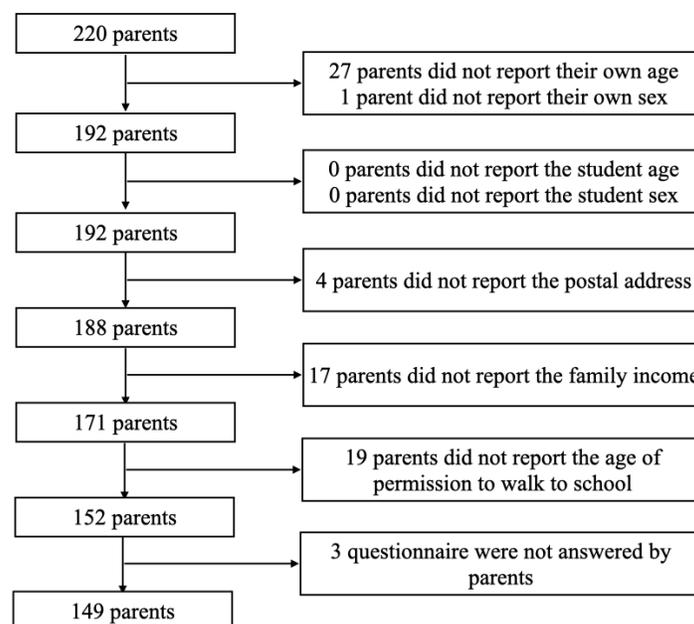


Figure 1. Flow chart of participants. (Parents= father or mother).

Ethical Requirements

Anonymity was ensured, following the ethical considerations of Research in Sports Science and Exercise²⁷ and the principles included in the Declaration of Helsinki²⁸. The Medical Ethics Committee of the University of Granada approved the PACO Project design, protocols, and informed consent procedure (case no. 162/CEIH/2016).

Procedures

Researchers held an initial meeting with the school board team, explaining the study's objectives, which was also given an informative letter. Once they agreed to participate, the parents of the students were invited to join with another letter, and signed informed consent was required to be involved in the study. On a second visit to the school, students were given a questionnaire for families, establishing a deadline of one week to complete them by their parents. Questionnaires were collected by the physical education teachers at each school. The questionnaire (available in: <http://profith.ugr.es/pages/investigacion/recursos/cuestionario-familias-v4>) included questions about sociodemographic information of the parents and offspring and the age of permission to walk to school. The questionnaire was answered only by one member of each family. Additionally, the distance between the home and school was measured. The questionnaire digitalization was done using the scanner Fujitsu fi-7160 and the software Data-Scan scanning data version 5.7.7.

Measures

Sociodemographic data

The personal data (i.e., age and sex) were reported by the parents and their offspring. Additionally, student educational level (i.e., Primary school student and Secondary school student) was also registered. Family income information was obtained from the salary of the family unit through the question: "What is the approximate monthly salary of the family unit (in euros)?" The response options were <499€, 500-999€, 1000-1499€, 1500-1999€, 2000-2499€, 2500-2999€, 3000-4999€, and >5000€.

Permission for walking to school

The age of permission to walk alone, to walk accompanied by an equal (i.e., other children and/or adolescents), or to walk accompanied by an adult (e.g., mother, father, grandparents, adult neighbours, etc.) was assessed with the following question: "With what age would you allow to your son/daughter to walk to school alone?" This question was repeated for permission to walk accompanied by an equal and walk accompanied by an adult. The response options for each question were: ≤7, 8-9, 10-11, 12-13, 14-15, 16-17, and ≥18 years old. Each permission to walk question was categorised into a binary with the options <12 years old (i.e., ≤7, 8-9, and 10-11 years old) and ≥12 years old (i.e., 12-13, 14-15, 16-17, and ≥18 years old).

Distance

The distance between the home and school was measured objectively for each participant. This was estimated using the Google Maps™ software. The distances were calculated by selecting the shortest route to walk from home and school postal addresses²⁹.

Statistical analysis

To describe the sample characteristics, mean and standard deviation were calculated for continuous variables and percentages for categorical variables. Additionally, chi-square tests were performed to determine differences by sex of the parent and by sex of the students in each of the permission to walk to



school variables (alone, accompanied by equal or accompanied by adults), segmented by educational level (i.e., primary school student and secondary school student).

Finally, the association between the sex of the parent and the sex of the student with the age of permission to walk were addressed using binary logistic regression models. In these models, the age of permission (<12 years old vs ≥ 12 years old) was included as a dependent variable and the sex of the parent, and sex of the student in a different model, as an independent variable using the entry method. Analyses were performed separately by educational level (i.e., primary school student and secondary school student). The student's age, the economic level, and the distance between home and school were used as covariates. All analyses were performed using the Statistical Package for the Social Sciences, version 25.0 for Mac OS (SPSS Inc., Chicago, Illinois, USA), and the significance level was set at $p < 0.05$.

Results

The descriptive characteristics of the study participants are presented in Table 1. Almost 75% of the sample of the parents corresponds to mothers, while the sex of schoolchildren is balanced. It is possible to observe how per family unit income does not exceed 2999€ in 92% of cases, and no family exceeds 4999€ monthly. Parents allow students to walk to school alone in 21% of cases when the student is <12 years old, compared to 78% when the student is ≥ 12 years old. The rates of walking to school accompanied by an equal or by an adult increase when the student is <12 years old (31% and 80% respectively) while decrease when the student is ≥ 12 years old (69% and 21% respectively).

Table 1. Descriptive characteristics of participants by educational level.

	All (n=149)	Primary school student (n=63)	Secondary school student (n=86)
Parent age (years old)^a	42.9 \pm 5.5	40.8 \pm 4.7	44.4 \pm 5.5
Child age (years old)^a	12.5 \pm 2.0	10.8 \pm 0.7	13.7 \pm 1.6
Parent's sex (%)			
Mothers	73.2	76.2	70.9
Schoolchild's sex (%)			
Girls	47.0	41.3	51.2
Family income (€; %)			
<499	2.7	3.2	2.3
500-999	12.8	9.5	15.1
1000-1499	32.9	36.5	30.2
1500-1999	16.1	14.3	17.4
2000-2499	14.1	19.0	9.3
2500-2999	14.8	12.7	16.3
3000-4999	7.4	4.8	9.3
>5000	0.0	0.0	0.0
Permission to walk			
Alone (%)			
<12 years old	21.5	15.9	25.6
≥ 12 years old	78.5	84.1	74.4
Accompanied by equals (%)			
<12 years old	30.9	28.6	32.6
≥ 12 years old	69.1	71.4	67.4
Accompanied by adults (%)			
<12 years old	79.2	77.8	80.2
≥ 12 years old	20.8	22.2	19.8
Walking distance (m)^a	1171.6 \pm 1441.0	1302.2 \pm 1539.9	1076.0 \pm 1365.4

^a data is presented as mean \pm standard deviation.

Figure 2 shows the percentages of permission to walk alone, to walk accompanied by equal or to walk accompanied by adults for students <12 years old based on the sex of the parent or student by educational level (i.e., primary school student and secondary school student). In those cases, with enough observations to perform the Chi-square test, no statistically significant differences were observed between mothers and fathers and between girls and boys within the same educational level ($p>0.05$) for all the permission to walk. Only a difference between mothers and fathers in the secondary school student group was found in the permission to walk accompanied by an adult when is <12 years old ($p<0.05$), with a higher permission percentage in mothers.

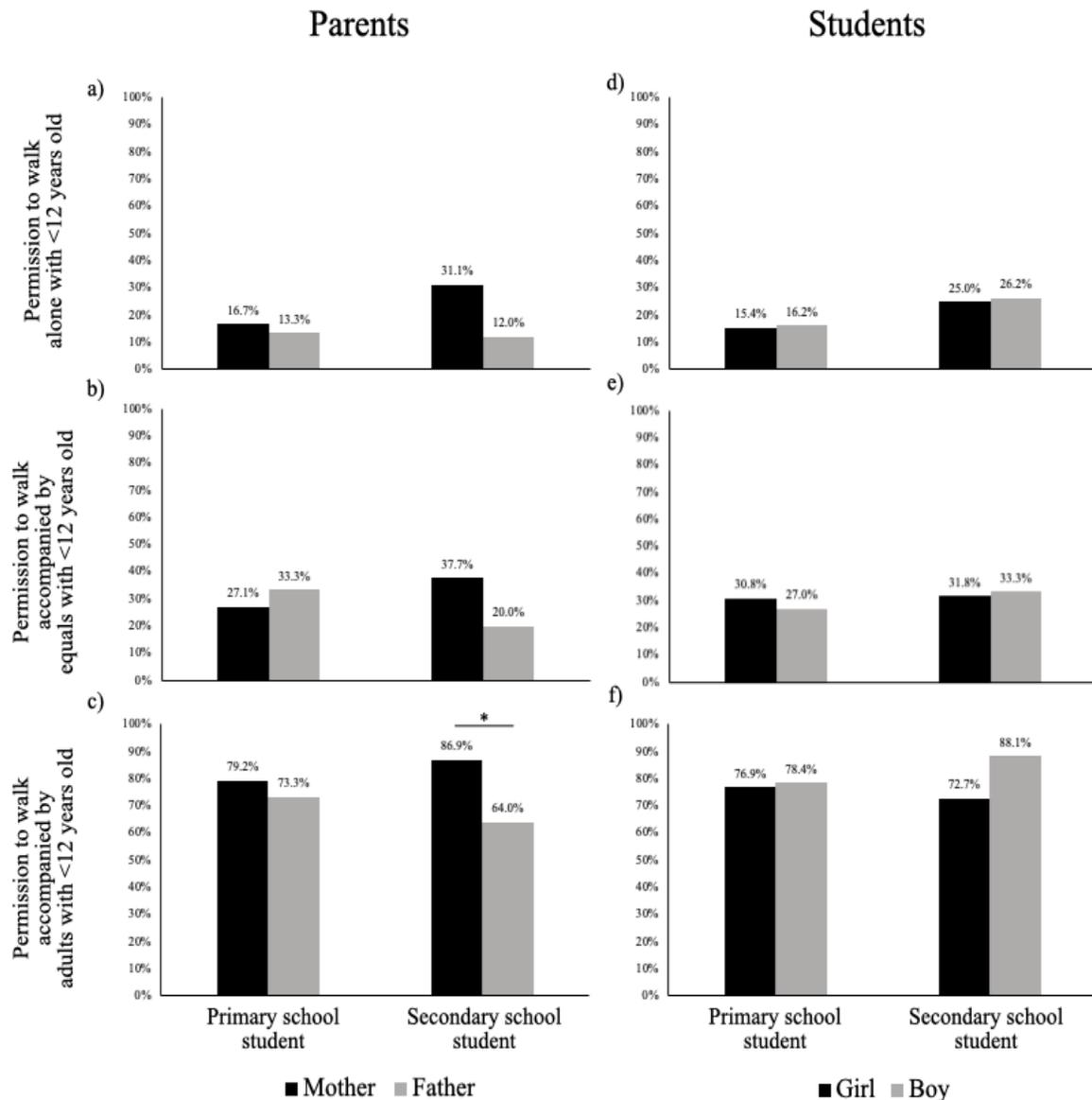


Figure 2. Percentage of permission to walk alone, to walk accompanied by the equal (i.e., children and/or adolescents) or to walk accompanied by adults (e.g., mother, father, grandparents, adult neighbours, etc.) with <12 years old based on the sex of the parent and the students, divided by educational level (primary school student or secondary school student). The sample corresponds to mothers with primary school students ($n=48$), mothers with secondary school students ($n=61$), fathers with primary school students ($n=15$), father with secondary school students ($n=25$), girls with primary school students ($n=26$), girl secondary school student ($n=44$), boy primary school student ($n=37$), boy secondary school student ($n=42$). * $p<0.05$.



Table 2 shows the association between the permission to walk alone, to walk accompanied by an equal, or to walk by an adult when the student is <12 years old (vs ≥ 12 years old) with the sex of the parent, separated by educational level (i.e., primary school student and secondary school student). Those participants who are mothers of secondary school students allowed the student <12 years old to walk to school accompanied by an adult five times more than those who are fathers ($p < 0.05$). No other statistically significant associations were observed (all, $p > 0.05$).

Table 3 shows the association between the permission to walk alone, accompanied by an equal or by an adult when the student is <12 years old (vs ≥ 12 years old) with the sex of the student, separated by educational level (i.e., primary school student and secondary school student). No statistically significant associations were observed between (all, $p > 0.05$).

Table 2. Associations between parental permissiveness to walk and sex of the parents.

	Primary school student (permission <12 years old vs ≥ 12 years old (ref.))			Secondary school student (permission <12 years old vs ≥ 12 years old (ref.))				
	OR	95% CI	<i>p</i> -value	OR	95% CI	<i>p</i> -value		
Walk alone								
Parent sex (mother)	1.38	0.18	10.40	0.755	3.41	0.78	14.95	0.104
Walk with equal								
Parent sex (mother)	0.63	0.15	2.59	0.523	2.10	0.59	7.41	0.251
Walking with adults								
Parent sex (mother)	1.08	0.26	4.58	0.916	4.94	1.26	19.44	0.022

OR= odds ratio; CI= Confidence interval; student's age, the economic level, and the distance between home and school were included as covariates.

Table 3. Association between parental permissiveness and sex of the student.

	Primary school student (permission <12 years old vs ≥ 12 years old (ref.))			Secondary school student (permission <12 years old vs ≥ 12 years old (ref.))				
	OR	95% CI	<i>p</i> -value	OR	95% CI	<i>p</i> -value		
Walk alone								
Student sex (girl)	0.43	0.06	2.88	0.385	0.73	0.24	2.19	0.569
Walk with equal								
Student sex (girl)	1.42	0.39	5.18	0.592	0.77	0.28	2.14	0.621
Walking with adults								
Student sex (girl)	0.88	0.23	3.41	0.854	0.35	0.10	1.27	0.111

OR= odds ratio; CI= Confidence interval; student's age, the economic level, and the distance between home and school were included as covariates.

Discussion

In this study, the permission to walk to school alone, to walk accompanied by an equal and to walk accompanied by an adult was described and associated with the parental and student sex. Overall, the analyses showed how the permission to walk to school when the student is <12 years old is greater when accompanied. On the other hand, no association between the permission to walk alone, to walk accompanied by equals or to walk accompanied by an adult under 12 years old with the sex of the parent or the children was found, except to walk to school accompanied by an adult in mothers of secondary school students.

In this study, most of the questionnaires were completed by mothers, as in previous studies^{30,31}. Of 149 parents who participated in this study, almost 75% of them were mothers. These response rates are common due to mothers are more involved in routine childcare than fathers^{29,30}. The female sex is traditionally identified with the reproductive work, which is referred to the home and childcare, subscribed to the scope of the private, not financially remunerated, and without social recognition. On the contrary, the male sex is usually identified with the productive work, that is, activities involving strength, leadership, independence, social recognition, payment, use of the public space and physical capacity, and their performance focuses on the scope of the public, that is, outside the home, at work, on the street, or in the case of the rural sector, in the field^{32,37}. Therefore, mothers are still more involved in the education of schoolchildren as has traditionally happened, and consequently, they are the most engaged in their children's school life.

The results of our study show that more permission is granted to walk to school when the student is <12 years old if he is accompanied by an equal (i.e., children and/or adolescents) than if he commutes alone, and again increases the percentage of permission if in this case the accompaniment is carried out by an adult (e.g., mother, father, grandparents, adult neighbours, etc.) instead to walk alone or accompanied by an equal. This result is in line with the findings of a previous systematic review, which showed an association between the permission to commute independently and to be accompanied by siblings or friends³⁸. This can be due to several factors, such as parents not feeling safe to let students go alone because most school children have not yet acquired cognitive and perceptual skills to manage complex traffic situations and the ability to assess and address other challenges that may arise^{39,40}. In addition, every day, the parents are less and less permissive because they are afraid of what might happen to their children in the street, such as sexual assaults, robberies, kidnappings⁴¹, and the media could have the effect of contributing to this fear issuing news of kidnappings of children daily, in various areas^{42,43}. Considering these events, the re-education of the parents is deemed necessary. It would be necessary to transmit to parents' truthful information and not be manipulated by the media, in addition to making them aware of the real perceptive capacities of the children.

Concerning the permissiveness of walking to school when the student is <12 years old and the sex of the parent or the student, no significant differences and relationships were found between the responses of the parents, except for walking accompanied by an adult between the mother and father of secondary school students. In a study focused on Spanish families of students aged 9 to 12 years old⁴⁴, they compared the different barriers perceived by parents about active commuting to school, and similar results were obtained referring to the sex of students, who showed no significant differences. Besides, this study concluded that intervention strategies to promote active commuting to school in students involving parents should have gender-specific actions since parents have different perceptions about the active commuting to their offspring's school. Additionally, in students between 12 and 17 years old, important differences in the autonomy of adolescents associated with the sex were found to be the most important difference in the desire for autonomy shown by females⁴⁵. The real achievement of this autonomy is greater in girls, and the achievement of autonomy associated with disobedience to parents is greater for boys. Despite the fact that previous studies did not report the relationship between sex and active commuting to school⁴⁶, other studies showed that boys are more likely to perform independent mobility (i.e., commuting alone or accompanied by equals) than girls, which differ from ours, in which there is no evidence of sex difference for these variables^{18,19}. The discrepancies between the previous studies and the current research regarding sex differences could be due to a cultural difference since similar studies conducted in different contexts could obtain different conclusions.

Moreover, the lack of differences between mothers and parents could be produced because the productive and reproductive work was not identified in the sample of parents. Society is progressing little

by little in the balanced distribution of roles and co-responsibility of care tasks⁴⁷. It can hypothesize that there are no differences at the level of parent sex because fathers who have answered the questionnaire, by doing so, are showing greater involvement in the care of their children and opinions more like those of mothers. To know if fathers and mothers have different positions regarding permissiveness, we would propose, for example, that they would answer both in each family.

Another option is not to leave it to the participant's choice but to establish who should answer in each family or parents. Schools that want to work with parents to encourage them to walk to school should consider that it will be easier for the mother or parent who assumes the reproductive role to be enrolled in their intervention strategy.

Limitations and Strengths

This study has several weaknesses. Firstly, using sex and not the role (productive or reproductive work) would be one of the main limitations. In addition, schools were chosen for convenience. Its cross-sectional design did not allow us to establish causal relationships, and the validity and reliability of the questionnaire should be analysed.

The main strengths were the number of participants in the study, which is elevated compared with previous studies that work with parents^{44,48}. In addition, this study incorporates sex as a variable of analysis, which implies incorporating a gender perspective. No differences are established according to sex, but it considers the effect that the social construction of the feminine and masculine has on the behaviour of fathers and mothers⁴⁴.

Conclusions

The permission to walk to school when the student is <12 years old is greater when the student's supervision in commuting is increased. Moreover, the permission to walk alone, to walk accompanied by equals or to walk accompanied by adults when the student is <12 years old is not associated with the sex of the parent or of the children, except in mothers of secondary school students.

References

1. Andersen LB, Harro M, Sardinha LB, et al. Physical activity and clustered cardiovascular risk in children: a cross-sectional study (The European Youth Heart Study). *Lancet*. 2006;368(9532):299-304. DOI:10.1016/s0140-6736(06)69075-2
2. Janssen I, LeBlanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*. 2010;7(1):40. DOI:10.1186/1479-5868-7-40
3. Poitras VJ, Gray CE, Borghese MM, et al. Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied physiology, nutrition, and metabolism*. 2016;41(6 Suppl 3):S197-239. DOI:10.1139/apnm-2015-0663
4. Rodriguez-Ayllon M, Cadenas-Sánchez C, Estévez-López F, et al. Role of Physical Activity and Sedentary Behavior in the Mental Health of Preschoolers, Children and Adolescents: A Systematic Review and Meta-Analysis. *Sports medicine*. 2019;49(9):1383-1410. DOI:10.1007/s40279-019-01099-5
5. WHO. Guidelines on Physical Activity and Sedentary Behaviour; Geneva, Switzerland. Published 2020. Accessed May 25. <https://www.who.int/publications/i/item/9789240015128>

6. Larouche R, Faulkner GEJ, Fortier M, Tremblay MS. Active Transportation and Adolescents' Health: The Canadian Health Measures Survey. *American Journal of Preventive Medicine*. 2014;46(5):507-515. DOI:10.1016/j.amepre.2013.12.009
7. Cooper AR, Andersen LB, Wedderkopp N, Page AS, Froberg K. Physical activity levels of children who walk, cycle, or are driven to school. *Am J Prev Med*. 2005;29(3):179-84. DOI:10.1016/j.amepre.2005.05.009
8. Sirard J, Riner J, McIver K, Pate R. Physical activity and active commuting to elementary school. *Medicine and science in sports and exercise*. 2005;37(12):2062-9. DOI:10.1249/01.mss.0000179102.17183.6b
9. Chillón P, Herrador-Colmenero M, Migueles JH, et al. Convergent validation of a questionnaire to assess the mode and frequency of commuting to and from school. *Scandinavian Journal of Public Health*. 2017;45(6):612-620. DOI:10.1177/1403494817718905
10. Gálvez-Fernández P, Herrador-Colmenero M, Esteban-Cornejo I, et al. Active commuting to school among 36,781 Spanish children and adolescents: A temporal trend study. *Scandinavian journal of medicine & science in sports*. 2021;31(4):914-924. DOI: 10.1111/sms.13917
11. Chillón P, Martínez-Gómez D, Ortega FB, et al. Six-year trend in active commuting to school in Spanish adolescents. The AVENA and AFINOS Studies. *International journal of behavioral medicine*. 2013;20(4):529-37. DOI:10.1007/s12529-012-9267-9
12. Colley M, Buliung RN. Gender differences in school and work commuting mode through the life cycle: exploring trends in the greater Toronto and Hamilton area, 1986 to 2011. *Transportation Research Record*. 2016;2598(1):102-109. DOI: 10.3141/2598-12
13. Smith M, Ikeda E, Duncan S, et al. Trends and measurement issues for active transportation in New Zealand's physical activity report cards for children and youth. *Journal of Transport & Health*. 2019;15:100789. DOI: 10.1016/j.jth.2019.100789
14. Badland H. Child Independent Mobility: Making the Case, and Understanding How the Physical and Social Environments Impact on the Behaviour. *Urbanization and the Global Environment*. 2012;51-79. DOI: no disponible.
15. Sirard J, Slater M. Walking and Bicycling to School: A Review. *American Journal of Lifestyle Medicine*. 2008;2(5):372-396. DOI:10.1177/1559827608320127
16. Phillips SP. Defining and measuring gender: a social determinant of health whose time has come. *International Journal for Equity in Health*. 2005;4(1):1-4. DOI: 10.1186/1475-9276-4-11
17. Lamas M. Diferencias de sexo, género y diferencia sexual. *Cuicuilco Nueva Época*, 2000;7(18). DOI: no disponible.
18. Brockman R, Fox KR, Jago R. What is the meaning and nature of active play for today's children in the UK? *International Journal of Behavioral Nutrition and Physical Activity*. 2011;8(1):15. DOI:10.1186/1479-5868-8-15
19. Foster S, Villanueva K, Wood L, Christian H, Giles-Corti B. The impact of parents' fear of strangers and perceptions of informal social control on children's independent mobility. *Health & place*. 2013;26C:60-68. DOI:10.1016/j.healthplace.2013.11.006
20. Glick P, Fiske ST. The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of personality and social psychology*. 1996;70(3):491. DOI: 10.1007/s11199-004-0718-x
21. Pacilli MG, Giovannelli I, Spaccatini F. Children's Independent Mobility: Antecedents and Consequences at Macro- and Microlevels. Part of the Geographies of Children and Young People book series. *GCYP*. 2016;6.

22. Bernal PP, Arroyo AMB. Género y espacialidad: análisis de factores que condicionan la equidad en el espacio público urbano. *Universitas Psychologica*. 2011;10(1):61-70. DOI:10.11144/Javeriana.upsy10-1.geaf
23. Kolektiboa H. Manual de análisis urbano. Género y vida cotidiana. Eusko Jaurlaritza. 2010.
24. Akar G, Fischer N, Namgung M. Bicycling Choice and Gender Case Study: The Ohio State University. *International Journal of Sustainable Transportation*. 2013;7(5):347-365. DOI:10.1080/15568318.2012.673694
25. Purdie N, Carroll A, Roche L. Parenting and adolescent self-regulation. *Journal of adolescence*. 2004;27(6):663-76. DOI:10.1016/j.adolescence.2004.01.002
26. Bumpus MF, Crouter AC, McHale SM. Parental autonomy granting during adolescence: exploring gender differences in context. *Developmental psychology*. 2001;37(2):163-73. DOI:10.1037/0012-1649.37.2.163
27. Harriss DJ, Macsween A, Atkinson G. Standards for Ethics in Sport and Exercise Science Research: 2018 Update. *International journal of sports medicine*. 2017;38(14):1126-1131. doi:10.1055/s-0043-124001
28. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama*. 2013;310(20):2191-4. DOI:10.1001/jama.2013.281053
29. Rodríguez-López C, Salas-Fariña ZM, Villa-González E, et al. The Threshold Distance Associated With Walking From Home to School. *Health education & behavior: the official publication of the Society for Public Health Education*. 2017;44(6):857-866. DOI:10.1177/1090198116688429
30. Skotko BG, Levine SP, Goldstein R. Having a son or daughter with Down syndrome: Perspectives from mothers and fathers. *American Journal of Medical Genetics Part A*. 2011;155(10):2335-2347. DOI: 10.1002/ajmg.a.34293
31. Guinchat V, Chamak B, Bonniau B, et al. Very early signs of autism reported by parents include many concerns not specific to autism criteria. *Research in Autism Spectrum Disorders*. 2012;6(2):589-601. DOI:10.1016/j.rasd.2011.10.005
32. Coltrane S. Research on household labor: Modeling and measuring the social embeddedness of routine family work. *Journal of Marriage and family*. 2000;62(4):1208-1233. DOI:10.1111/j.1741-3737.2000.01208.x
33. García-Calvente MdM, Mateo-Rodríguez I, Eguiguren AP. El sistema informal de cuidados en clave de desigualdad. *Gaceta Sanitaria*. 2004;18:132-139. DOI: no disponible.
34. García-Calvente MdM, Mateo-Rodríguez I, Maroto-Navarro G. El impacto de cuidar en la salud y la calidad de vida de las mujeres. *Gaceta sanitaria*. 2004;18:83-92. DOI: no disponible.
35. Guevara-Jiménez M, Cabrera-Cifuentes KA, Buitrago-Peña MdP. Las representaciones sociales de género y castigo y su incidencia en la corrección de los hijos. *Educación y Educadores*. 2009;12(3):53-71. Available in: <https://www.redalyc.org/articulo.oa?id=83412235004>.
36. Lachance-Grzela M, Bouchard G. Why do women do the lion's share of housework? A decade of research. *Sex roles*. 2010;63(11):767-780. DOI: 10.1007/s11199-010-9797-z
37. Menéndez MdCR. La distribución sexual del trabajo reproductivo. *Acciones e investigaciones sociales*. 2008;(26):61-90. DOI:10.26754/ojs_ais/ais.200826334
38. Marzi I, Demetriou Y, Reimers AK. Social and physical environmental correlates of independent mobility in children: a systematic review taking sex/gender differences into account. *International journal of health geographics*. Jul 3 2018;17(1):24. DOI:10.1186/s12942-018-0145-9

39. Alparone FR, Pacilli MG. On children's independent mobility: the interplay of demographic, environmental, and psychosocial factors. *Children's Geographies*. 2012;10(1):109-122. DOI:10.1080/14733285.2011.638173
40. Prezza M, Alparone FR, Cristallo C, Luigi S. Parental perception of social risk and of positive potentiality of outdoor autonomy for children: The development of two instruments. *Journal of environmental psychology*. 2005;25(4):437-453. DOI:10.1016/j.jenvp.2005.12.002
41. Fyhri A, Hjorthol R, Mackett RL, Fotel TN, Kyttä M. Children's active travel and independent mobility in four countries: Development, social contributing trends and measures. *Transport policy*. 2011;18(5):703-710. DOI:10.1016/j.tranpol.2011.01.005
42. Miller JM, Kurlycheck M, Hansen JA, Wilson K. Examining child abduction by offender type patterns. *Justice Quarterly*. 2008;25(3):523-543. DOI:10.1080/07418820802241697
43. Shutt JE, Miller JM, Schreck CJ, Brown NK. Reconsidering the leading myths of stranger child abduction. *Criminal Justice Studies*. 2004;17(1):127-134. DOI:10.1080/0888431042000217688
44. Solana AA, Mandic S, Lanaspá EG, Gallardo LO, Casterad JZ. Parental barriers to active commuting to school in children: does parental gender matter? *Journal of Transport & Health*. 2018;9:141-149. DOI:10.1016/j.jth.2018.03.005
45. Fleming M. Género y autonomía en la adolescencia: las diferencias entre chicos y chicas aumentan a los 16 años. *Electronic journal of research in educational psychology*. 2005;3(2):33-52. DOI:10.25115/ejrep.v3i6.1159
46. DeWeese RS, Acciai F, Tulloch D, Lloyd K, Yedidia MJ, Ohri-Vachaspati P. Active commuting to school: A longitudinal analysis examining persistence of behavior over time in four New Jersey cities. *Preventive Medicine Reports*. 2022;9:101718. DOI:10.1016/j.pmedr.2022.101718
47. Lozares C, López Roldán P, Martí J. La relación entre los tiempos y las actividades del trabajo productivo y del reproductivo. *Revista iberoamericana de relaciones laborales*. 2004;13:165-186. DOI: no disponible.
48. Huertas-Delgado FJ, Herrador-Colmenero M, Villa-González E, et al. Parental perceptions of barriers to active commuting to school in Spanish children and adolescents. *European journal of public health*. 2017;27(3):416-421. DOI:10.1093/eurpub/ckw249

Affiliations

¹La Inmaculada Teacher Training Centre, University of Granada, Spain.

²PROFITH “PROmoting FITness and Health through Physical Activity” Research Group, Sport and Health University Research Institute (iMUDS), Faculty of Sport Sciences, University of Granada, Spain.

³Didactic of Corporal Expression, Faculty of Education Sciences, University of Granada, Spain.

Authorship declaration

M.H.C., and M.J.G.R. contributed to the conception and design of the study. M.H.C., P.E.P., R.G.S.A., and M.J.A.B. have carried out the data collection. P.E.P. analyzed the data, prepared figures, and tables. M.H.C., P.E.P., R.G.S.A., M.J.A.B., and M.J.G.R. authored and reviewed drafts of the papers and approved the final draft. All authors read and approved the final manuscript.

Acknowledgements

We want to express our gratitude to the schools, children and families that have collaborated in this study.

Conflict of interest

The authors have no conflict of interest to declare.

Funding

The study is part of the PACO Project, and it was supported by the Spanish Ministry of Economy, Industry and Competitiveness and the European Regional Development Fund (DEP2016-75598-R, MINECO/FEDER, UE). Additionally, this study has been partially funded by the University of Granada, Plan Propio de Investigación 2016, Excellence actions: Units of Excellence; Unit of Excellence on Exercise and Health (UCEES), and by the Junta de Andalucía, Consejería de Conocimiento, Investigación y Universidades, European Regional Development Fund (ERDF), ref. SOMM17/6107/UGR.



Copyright (c) 2022 Journal of Movement and Health. Este documento se publica con la política de Acceso Abierto. Distribuido bajo los términos y condiciones de Creative Commons 4.0 Internacional <https://creativecommons.org/licenses/by-sa/4.0/>.