

BEPAS

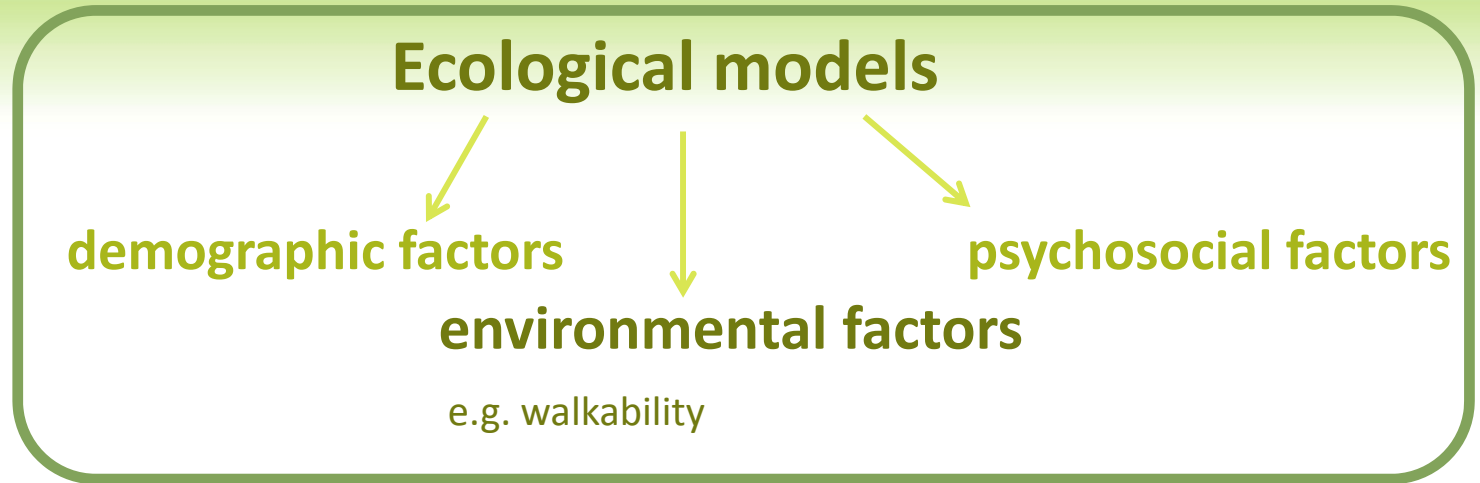
ASSOCIATIONS BETWEEN NEIGHBOURHOOD WALKABILITY, NEIGHBOURHOOD SES AND PHYSICAL ACTIVITY: ADULTS VERSUS ADOLESCENTS

Femke De Meester
Delfien Van Dyck
Ilse De Bourdeaudhuij, PhD
Benedicte Deforche, PhD
Greet Cardon, PhD



Ghent University – BELGIUM
Faculty of Medicine and Health Sciences
Department of Movement and Sports Sciences

BACKGROUND



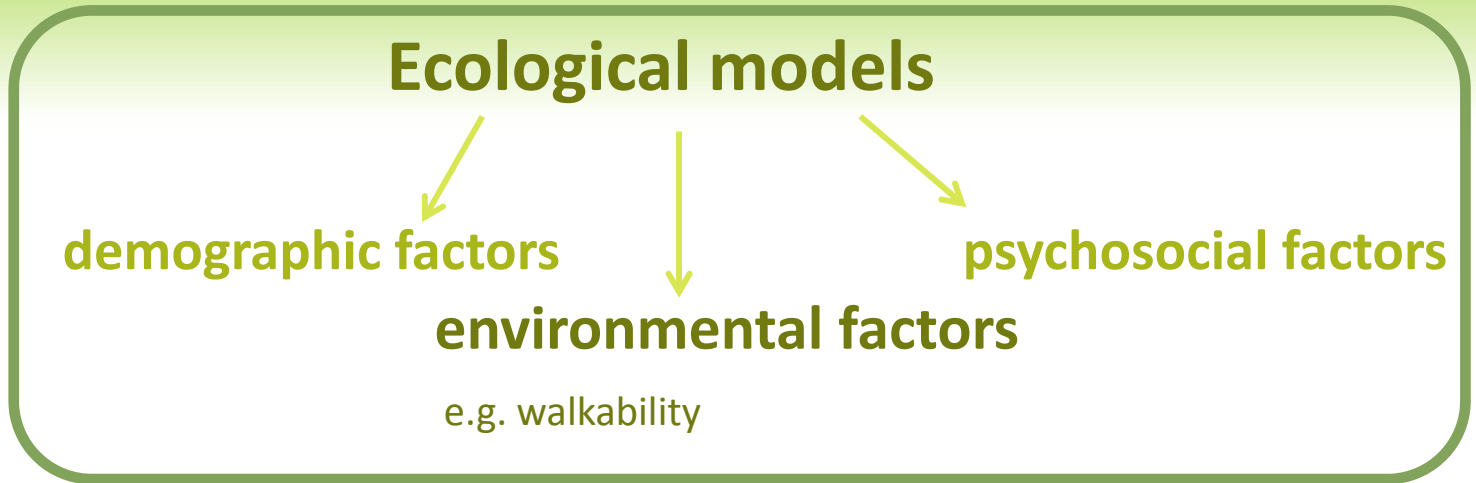
➔ **differences in physical environments**

USA, Australia, Europe

➔ **differences in PA behaviour**

➔ **European studies needed**

BACKGROUND



→ **differences in physical environments**

USA, Australia, Europe

→ **differences in PA behaviour**

→ **European studies needed:**

BEPAS*

* **Belgian Environmental Physical Activity Study**

BACKGROUND

© Walkability – PA

- **in adults:** clear link

(United States: Sallis et al. 2009; Australia: Owen et al. 2007 and Europe (Belgium): Van Dyck et al. 2010)

- **in adolescents:** more inconsistencies in the evidence

(Europe (Belgium) Van Dyck et al. 2009 + BEPAS-Youth, United States: Kligerman et al. 2007, Patnode et al. 2010, Panter et al. 2008)



CURRENT STUDY



AIM

Are neighbourhood walkability and neighbourhood SES to the same extent related to the levels of PA in an adolescent and adult population?

AIM

Are **neighbourhood walkability** and **neighbourhood SES** to the same extent related to the **levels of PA** in an **adolescent** and **adult population**?



Comparison of the association between neighbourhood walkability, SES and levels of PA in adolescents and adults living in the same neighbourhoods.

METHOD

BEPAS: Belgian Environmental Physical Activity Study

→ design similar to NQLS* and PLACE** studies

◎ **Neighbourhood selection:**

Ghent, Belgium:

neighbourhoods selected based on walkability and SES

- **GIS:** connectivity, residential density, land use mix
- **neighbourhood SES (median annual household income):** national institute of statistics (NIS)

METHOD

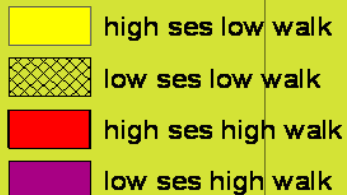
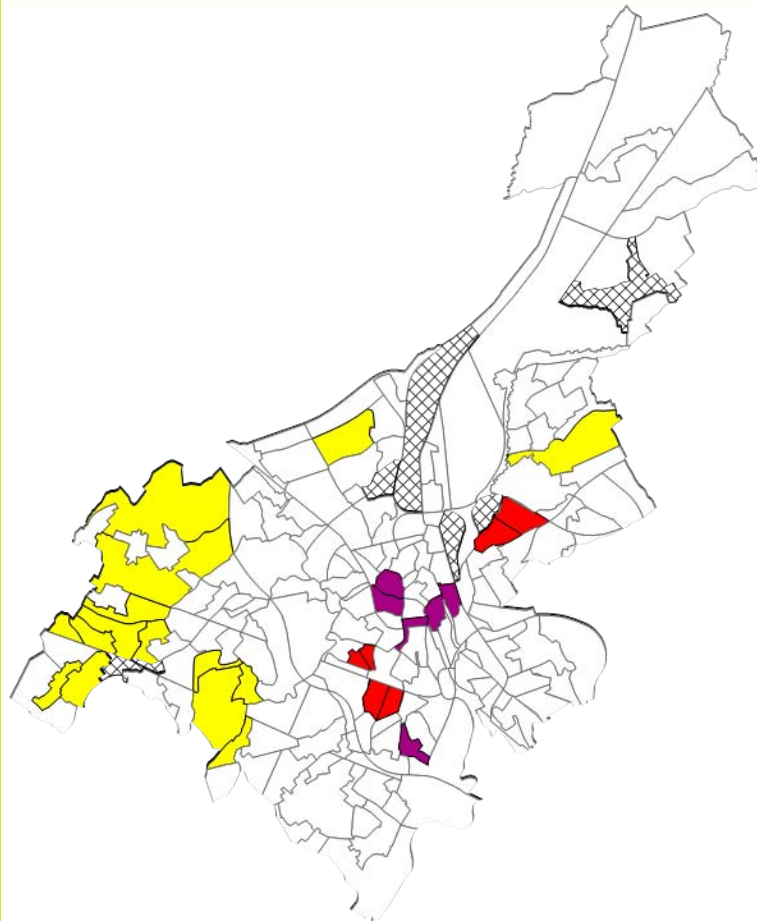
24 neighbourhoods:

6 high WALK / high SES

6 low WALK / low SES

6 low WALK / high SES

6 high WALK / low SES





METHOD

◎ Selection participants

Stage 1: potential participants (adolescents aged 13 to 15 and adults aged 20 to 65) received a letter

Stage 2: potential participants were visited at home

→ IPAQ or FPAQ interview, NEWS, 7 day accelerometer, demographic and psychosocial questionnaire, antropometric measures

Stage 3: 1 week after first visit: collection of the accelerometers



METHOD

⊙ Measures and instruments

(used for results presented here)

PA : - adults: long IPAQ interview version (last 7 days)

- adolescents: FPAQ interview version

- adults + adolescents: 7 day accelerometer



METHOD

◎ Analyses

- Multilevel regression analyses (MLwiN 2.20)
- 2 levels: level 1: individual-level variables
(group: adolescent / adult, PA, educational attainment)
level 2: neighbourhood-level variables
(WALKABILITY / SES)
- Analyses controlled for possible confounders: educational attainment (individual SES)
- Skewed variables were logarithmic transformed
- Statistical significance $p < 0.05$

RESULTS: DESCRIPTIVES

- © **Participants:** 478 adolescents (response rate 59.5%)
1200 adults (response rate 58.0%)

	Adolescents	Adults	Total
Gender (%)	50.3 %	47.9 %	48.6 %
SES (% high SES)	70.7 %	60.9 %	63.6 %

RESULTS: GROUP x WALK

	group x WALK
Moderate to vigorous PA (obj.)	n.s.
Active transport (self-reported)	***
Sport during leisure time (self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

- The association between **neighbourhood walkability** and **MVPA** is **similar** in adults and adolescents
- The association between **neighbourhood walkability** and **active transport** is **different** in adults and adolescents
- The association between **neighbourhood walkability** and **sport during leisure time** is **similar** in adults and adolescents

RESULTS: GROUP x WALK

Adolescents + adults

	High WALK mean (SD) (min./day)	Low WALK mean (SD) (min./day)	β (SE)
MVPA (obj.)	37.4 (24.4)	31.6 (22.7)	0.076 (0.019) ***

→ For the **total group** (adolescents + adults) living in a **high walkable** neighbourhood is associated with **more moderate to vigorous PA** (obj. measure)

	group x WALK
Moderate to vigorous PA (MVPA) (obj.)	n.s.
Active transport (AT) (self-reported)	***
Sport during leisure time (sport)(self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

RESULTS: GROUP X WALK

Adolescents

	High WALK mean (SD) (min./week)	Low WALK mean (SD) (min./week)	β (SE)
AT	179.5 (132.4)	191.4 (159.9)	0.07 (0.102)

→ For adolescents no difference in active transport was found between high and low walkable neighbourhoods

Adults

	High WALK mean (SD) (min./week)	Low WALK mean (SD) (min./week)	β (SE)
AT	199.0 (210.8)	81.6 (126.5)	0.747 (0.110) ***

→ For adults living in high walkable neighbourhoods was associated with more active transport

	group x WALK
Moderate to vigorous PA (MVPA) (obj.)	n.s.
Active transport (AT) (self-reported)	***
Sport during leisure time (sport)(self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

RESULTS: GROUP X WALK

Adolescents + adults

	High WALK mean (SD) (min./week)	Low WALK mean (SD) (min./week)	β (SE)
sport	121.6 (206.9)	106.7 (147.4)	0.021 (0.061)

→ For **the total group** (adolescents + adults) **no difference in sport during leisure time** was found **between high and low walkable** neighbourhoods

	group x WALK
Moderate to vigorous PA (MVPA) (obj.)	n.s.
Active transport (AT) (self-reported)	***
Sport during leisure time (sport) (self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

RESULTS: GROUP X SES

	group x SES
Moderate to vigorous PA (obj.)	**
Active transport (self-reported)	n.s.
Sport during leisure time (self-reported)	n.s.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

- The association between **neighbourhood SES** and **moderate to vigorous PA** is **different** in adults and adolescents
- The association between **neighbourhood SES** and **active transport** is **similar** in adults and adolescents
- The association between **neighbourhood SES** and **sport during leisure time** is **similar** in adults and adolescents

RESULTS: GROUP X SES

Adolescents

	High SES mean (SD) (min./day)	Low SES mean (SD) (min./day)	β (SE)
MVPA	35.1 (25.2)	29.2 (21.3)	0.114 (0.048) **

→ For adolescents living in high SES neighbourhoods is associated with more moderate to vigorous PA

Adults

	High SES mean (SD) (min./day)	Low SES mean (SD) (min./day)	β (SE)
MVPA	33.4 (22.1)	37.1 (25.2)	- 0.026 (0.029)

→ For adults no difference in moderate to vigorous PA was found between high and low SES neighbourhoods

	group x SES
Moderate to vigorous PA (MVPA) (obj.)	**
Active transport (AT) (self-reported)	n.s.
Sport during leisure time (sport) (self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

RESULTS: GROUP X SES

Adolescents + adults

	High SES mean (SD) (min./week)	Low SES mean (SD) (min./week)	β (SE)
AT	128.3 (150.7)	180.1 (194.5)	- 0.164 (0.063) **

→ For the total group (adolescents + adults) living in **high SES** neighbourhoods is associated with **less active transport**

	group x SES
Moderate to vigorous PA (MVPA) (obj.)	**
Active transport (AT) (self-reported)	n.s.
Sport during leisure time (sport) (self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001

RESULTS: GROUP X SES

Adolescents + adults

	High SES mean (SD) (min./day)	Low SES mean (SD) (min./day)	β (SE)
Sport	124.1 (193.7)	103.4 (163.0)	0.185 (0.058) ***

→ For the total group (adolescents + adults) living in high SES neighbourhoods is associated with more sport during leisure time

	group x SES
Moderate to vigorous PA (MVPA) (obj.)	**
Active transport (AT) (self-reported)	n.s.
Sport during leisure time (sport) (self-reported)	n.s.

* p<0.05; ** p<0.01; *** p<0.001



DISCUSSION

© Walkability – PA

- active transport: adolescents ≠ adults

adolescents:

- **no difference** between low and high walk neighbourhoods
≠ Frank et al. 2007, Kerr et al. 2007, Van Dyck et al. 2009

adults:

- 118 min./wk **more active transport** in **high walk** neighbourhoods
~ Sallis et al. 2009 (walking), Saelens et al. 2003

→ possible explanation:

walkability index = defined using adult criteria: other important variables that determine youth's active transport?

OR Belgian youth use active transport if the distance is feasible?

DISCUSSION

© Walkability – PA

- Sport and MVPA: adolescents = adults

adolescents + adults:

- **no difference for sport during leisure time**

→ **hypothesis:** higher land use mix/greater access to recreational facilities - more sport during leisure time = not supported

- 6 min./day **more MVPA** in **high walk** neighbourhoods
~ Kligerman et al. (2007), Sallis et al. (2009)

→ **important result for future PA interventions!**

DISCUSSION

◎ SES – PA

- AT and sport: adolescents = adults

adolescents + adults:

52 min./wk **less AT** in **high SES** neighbourhoods

~ van Lenthe et al. 2005, Billie Giles-corti et al. (2002), Babey et al. 2009, Frank et al. 2007

→ possible explanation: motorized transport and public transport = expensive

21 min./wk **more sport** in **high SES** neighbourhoods

~ McNeill et al. 2006, Voorhees et al. 2009, Giles-Corti et al. (2002)

→ possible explanation: low SES neighbourhoods: less places to exercise and limited resources



DISCUSSION

◎ SES – PA

- MVPA : adolescents ≠ adults

adolescents:

6 min./day **more MVPA** in **high SES** neighbourhoods

~ Drenowatz et al. 2010, Borraccino et al. 2009

adults:

no difference between low and high SES neighbourhoods

~ Sallis et al. 2009

→ neighbourhood SES inequalities contribute to differences in PA

CONCLUSION

- **High walkability associated with higher levels of MVPA in adults and adolescents**
- **High SES is associated with more sport during leisure time and less active transport in adults and adolescents**



important to consider when selecting key elements for PA interventions

CONCLUSION

→ **Clear differences between adults and adolescents**

- **Active transport x neighbourhood walkability**
- **MVPA x neighbourhood SES**



important to consider when selecting key elements for PA interventions



CONCLUSION

◎ **Strengths**

- use of self-reported and objective PA data
- adolescents and adults living in the same neighbourhoods

◎ **Possibilities for future research**

- context specific research: specific populations, specific continents/countries, specific PA behaviours
- individual GIS: measuring environmental characteristics within a buffer
- longitudinal studies: causal relations
- comparison interaction SES X WALK between adults and adolescents



CONCLUSION

Thank You!

Questions?

Suggestions?