Socio-Economic Status and Perceived Barriers to Physical Activity:
An Ecological Perspective

Ester Cerin[1] and Eva Leslie[2]

[1]Institute of Human Performance, The University of Hong Kong
[2]School of Health and Social Development, Deakin University, Australia

Socio-economic status and physical activity … current evidence …

Leisure-time PA

- **Positive association with educational attainment**

WHY? – Positive attitudes towards PA and greater motivation
  - Better skills
  - Better awareness about exercise opportunities and alternatives
  - Social support from family and friends
  - Better health

- **Positive association with household income**

WHY? – As above
  - Greater range of available alternatives
  - PA-friendlier built environment (facilities; infrastructure; safety)

… perceived barriers … an ecological perspective …

Socio-economic status and physical activity … current evidence …

Transport-related PA

- Non significant association with educational attainment

WHY? – Greater impact of environmental factors than psychosocial factors?

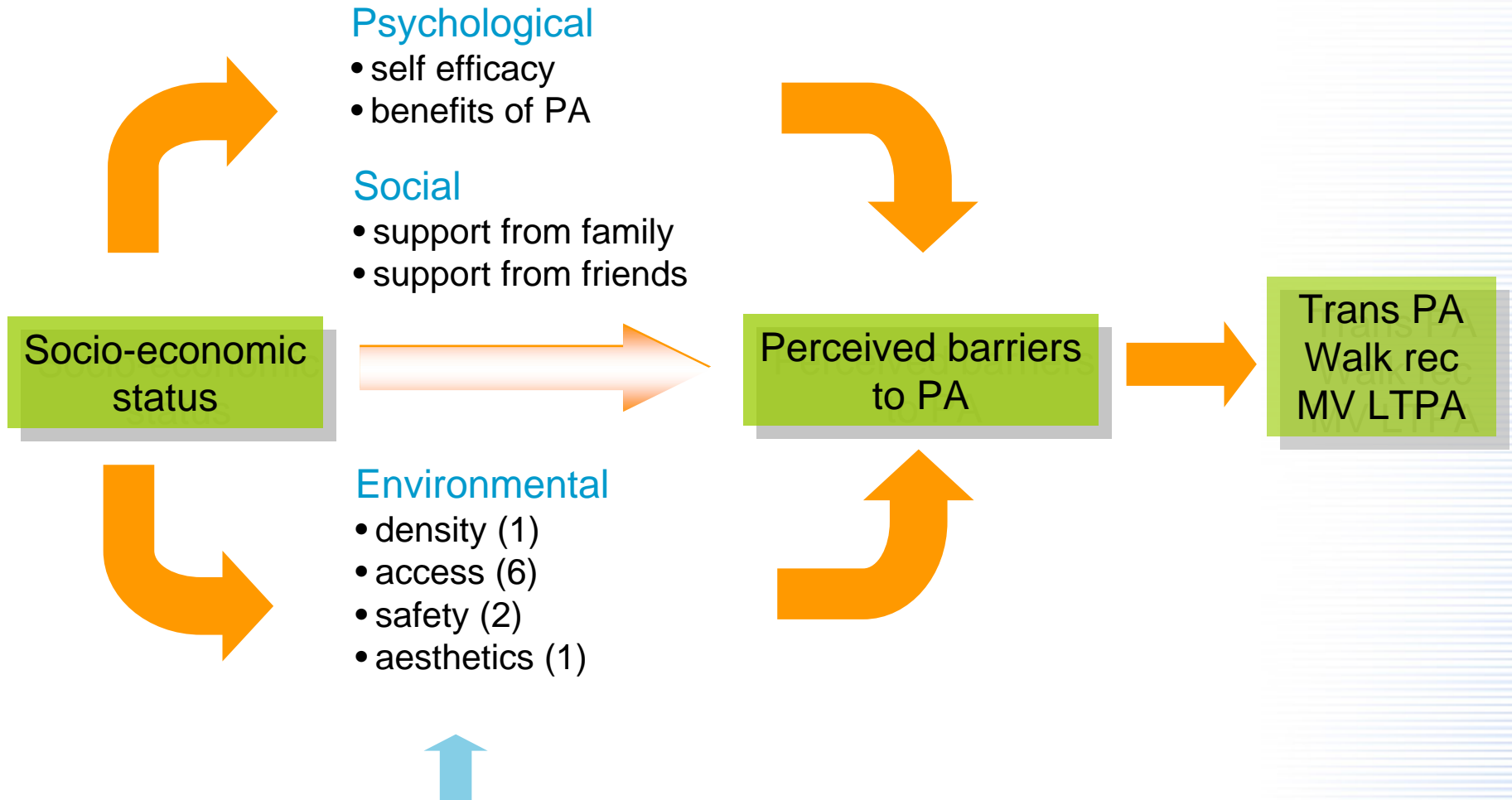- Possible/weak negative association with household income

WHY? – Greater availability of motorized transport
  – Time constraints
  – Preference for other types of physical activity (e.g. leisure-time PA)
  – Better access to services

… perceived barriers … an ecological perspective …

Aims of this presentation … to examine …

Psychological
- self efficacy
- benefits of PA

Social
- support from family
- support from friends

Socio-economic status

Environmental
- density (1)
- access (6)
- safety (2)
- aesthetics (1)

Perceived barriers to PA

Trans PA
Walk rec
MV LTPA

Mediating, independent, proxy or overlapping factors?

Methods … recruitment …

↗ Participants

- N = 2650 (aged 20-65) – Adelaide, Australia

↗ Multi-stage stratified sampling strategy

↗ 32 communities

- High SES and high walkability (n=8)
- High SES and low walkability (n=8)
- Low SES and high walkability (n=8)
- Low SES and low walkability (n=8)

PLACE
Physical Activity in Localities and Community Environments

Objective walkability = dwelling density + street connectivity + land use mix + net retail area

Methods … measures …
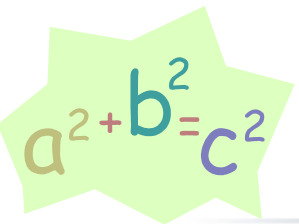
- Socio-economic status
  - Educational attainment
  - Household income
  - Area-level median household income (Census)
- Perceived barriers to PA (Hovell et al., 1989)
- Self-efficacy for PA (Sallis et al., 1998)
- Perceived benefits of PA (Hovell et al., 1989)
- Social support for PA (Sallis et al., 1992)
- Neighbourhood Environment Walkability Scale (Aussie) (Leslie et al., 2005)
- Number of recreational facilities (Sallis et al., 1997)
  - Indoor and outdoor individual-sport facilities
- Physical activity (IPAQ long; Craig et al., 2002)
  - Walking for recreation
  - Moderate-vigorous leisure-time PA
  - Transport-related PA
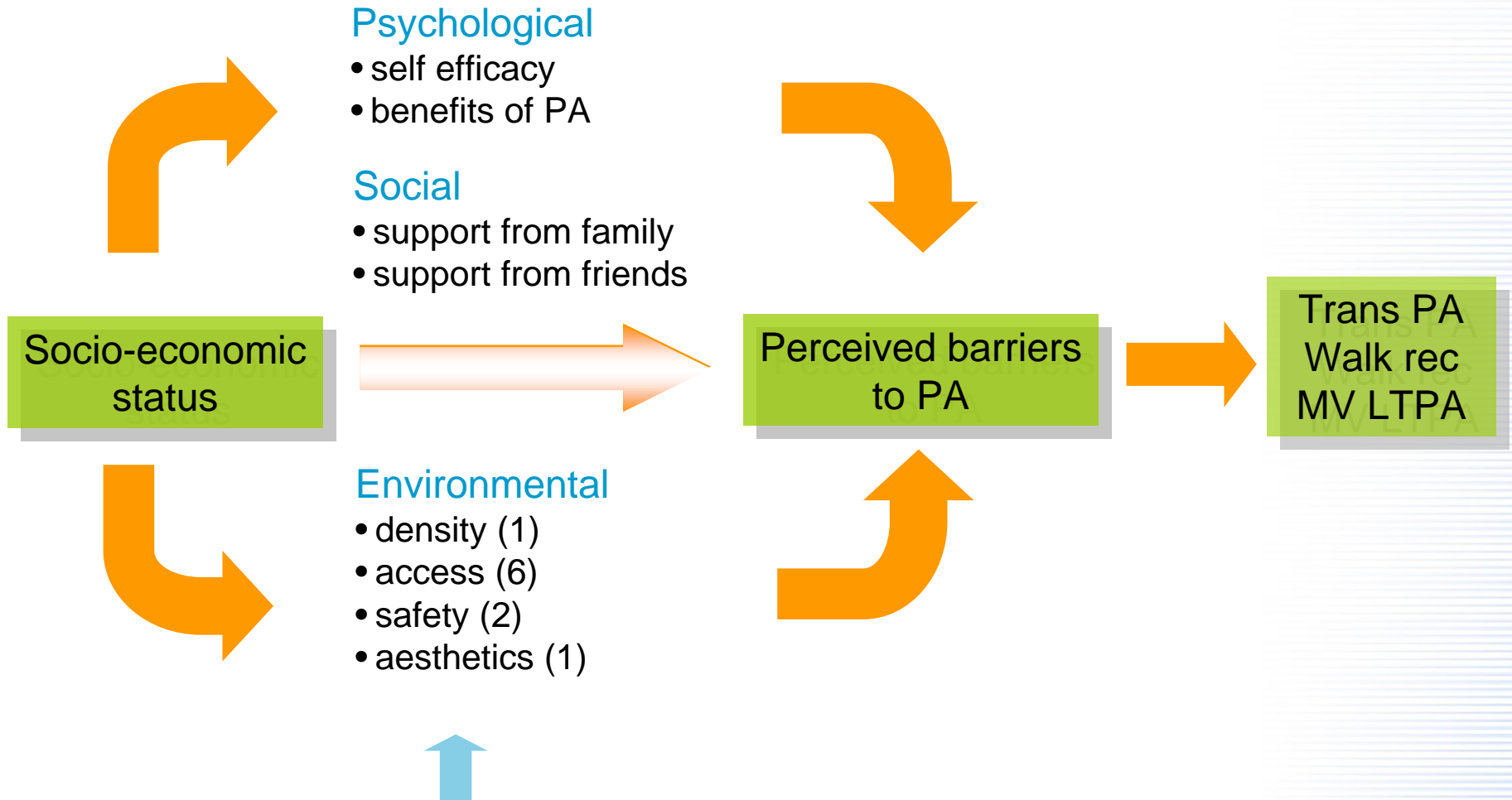
Methods … data analyses …

- Generalised linear models with robust estimates of standard errors (clustering effects)

- **Steps:**
  - Relationships between SES and perceived barriers to PA (adjusted for socio-demographic factors)
  - Relationships between SES and psychosocial and environmental factors
  - Independent associations between psychosocial and environmental factors and perceived barriers to PA (controlling for SES)
  - Independent associations between barriers to PA and types of PA (controlling for SES and psychosocial and environmental factors)
  - Direct and indirect 'effects' of SES

$a^2 + b^2 = c^2$

Aims of this presentation … to examine …

Psychological
- self efficacy
- benefits of PA

Social
- support from family
- support from friends

Socio-economic status

Environmental
- density (1)
- access (6)
- safety (2)
- aesthetics (1)

Perceived barriers to PA

**Trans PA
Walk rec
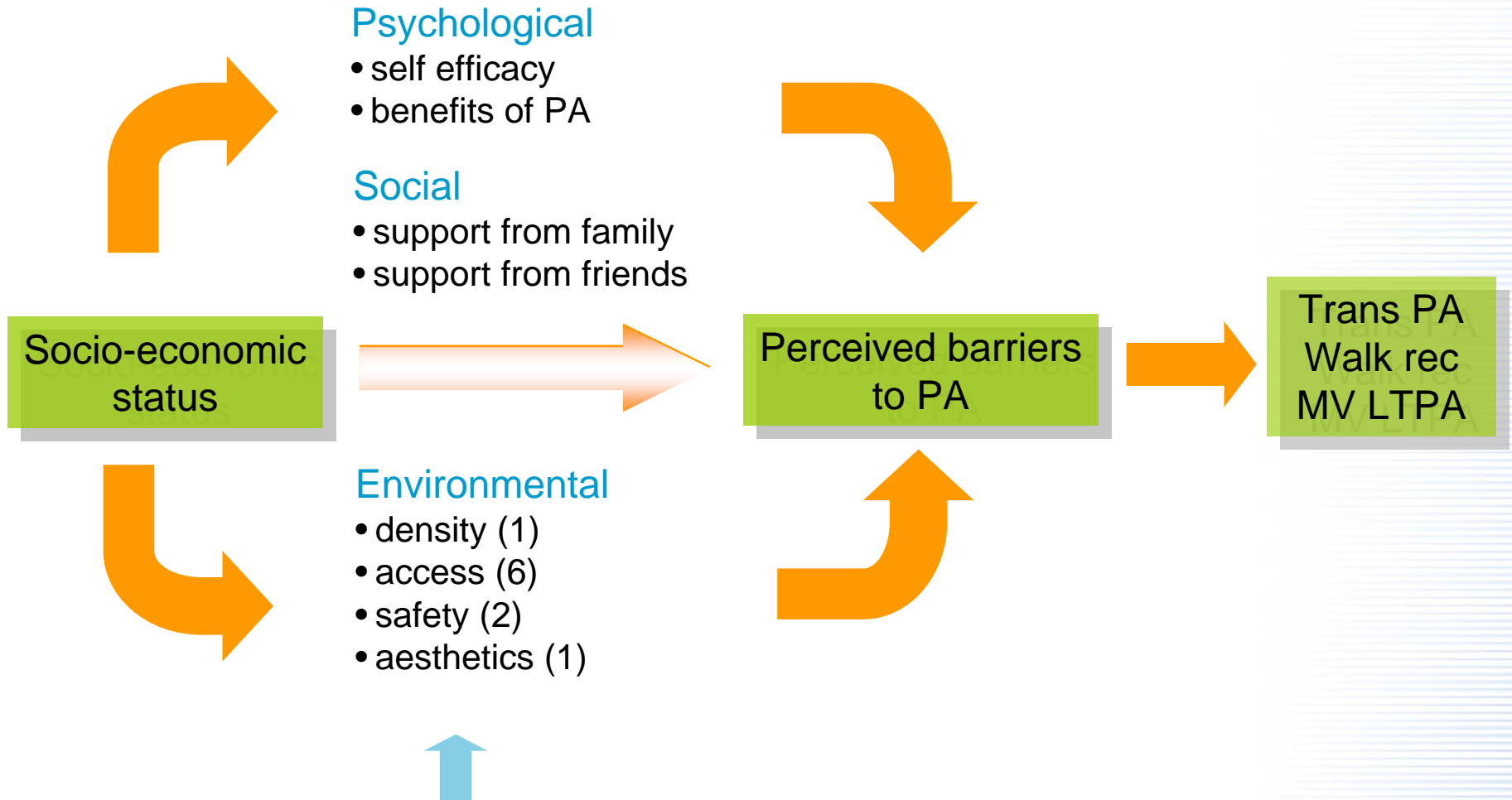MV LTPA**

Mediating, independent, proxy or overlapping factors?

Results …SES and perceived barriers to PA … effect sizes (r)
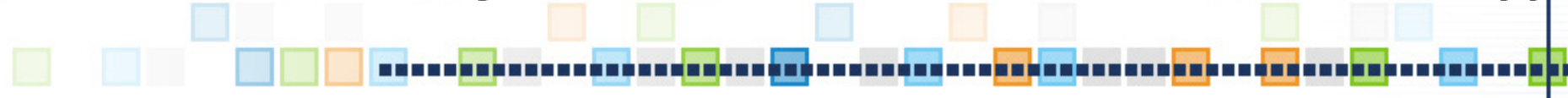
Barriers (0 to 4) Ms: 1.0 to 2.3 SDs: 0.9 to 1.2	Education (ref: < secondary)	Household income (individual-level) (ref: <Au$ 31k)	Household income (area-level)
Facilities (6.8%)	-.07	-.12	-.09
Health (5.7%)	-.07	-.13	-.07
Skills (5.6%)	-.09	-.11	-.05
Look (3.6%)	-.05	-.08	-.06
Social s. (3.7%)	-.06	-.09	-.07
Motivation (2.0%)	-.08	-.06	ns
Weather (1.1%)	ns	-.05	ns
Time (1.0%)	ns	.07	ns

Adjusted for socio-demographic factors and other SES indicators

Aims of this presentation … to examine …

Psychological
- self efficacy
- benefits of PA

Social
- support from family
- support from friends

Socio-economic status

Environmental
- density (1)
- access (6)
- safety (2)
- aesthetics (1)

Perceived barriers to PA

Trans PA
Walk rec
MV LTPA

Mediating, independent, proxy or overlapping factors?

Results …% of SES 'effects' on barriers explained by??

Barriers (%v)	Psychological			Social			Environmental		
	Edu	IHI	AHI	Edu	IHI	AHI	Edu	IHI	AHI
Facilities (21%)	22	16	16	10	9	12	8	13	72[#]
Health (24%)	34	22	29	-	-	-	15	15	50
Skills (20%)	24	25	37	4	8	10	6	14	44
Look (20%)	28[#]	38[#]	11[#]	10	-	7	20	32	16[#]
Social (24%)	46[#]	40[#]	30[#]	10	13	10	7	14	18[#]
Motivation (33%)	50	69	52	10	15	18	-	8	25[#]
Weather (7%)	-	38[#]	-	-	-	-	-	13	co
Time (24%)	-	spr	-	-	-	-	-	spr	co

[#] inconsistent effects present; co = effects cancel out; spr = suppression

Aims of this presentation … to examine …

Psychological
- self efficacy
- benefits of PA

Social
- support from family
- support from friends

Socio-economic status

Environmental
- density (1)
- access (6)
- safety (2)
- aesthetics (1)

Perceived barriers to PA

Trans PA Walk rec MV LTPA

Mediating, independent, proxy or overlapping factors?

Results ... independent 'effects' of barriers on PA ...

% change in mean (95% CI)

MET-min wk **Barriers**	**MV LTPA** M: 601, SD: 1241 (total R^2 = 28.9%)		**Walking for rec** M: 416, SD: 726 (total R^2 = 13.4%)		**Transport PA** M: 898; SD: 1420 (total R^2 = 8.0%)	
Facilities	-20	(-28, -11)	ns		18*	(9, 27)
Health	-18	(-28, -5)	ns		9*	(2, 18)
Skills	-18	(-26, -8)	(13)*	(1, 27)	23*	(13, 33)
Look	-11	(-21, -1)	ns		ns	
Social	-22	(-31, -13)	ns		ns	
Motivation	-35*	(-44, -25)	-24*	(-39, -24)	-21*	(-28, -13)
Weather	-17	(-26, -7)	ns		ns	
Time	-20*	(-29, -9)	-8*	(-15, -2)	-9*	(-15, -3)

* Significant after adjusting for other barriers

Results ... from SES to PA ... direct and indirect 'effects' ...

	MV LTPA			Walking for rec			Transport PA		
Hypothetical pathway	Edu	IHI	AHI	Edu	IHI	AHI	Edu	IHI	AHI
PSE – barriers +	7%	8%	8%	5%	7%	7%	4%	4%	5%
−	*ns*	*ns*	*ns*	-1%	-2%	-2%	-4%	-6%	-9%
Barriers +	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
−	*ns*	-3%	*ns*	-2%	-4%	*ns*	-6%	-11%	*ns*
PSE +	19%	18%	25%	8%	10%	3%	3%	4%	3%
−	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	-4%	-5%	-13%
Direct	35%	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*	-19%	*ns*
TOTAL	72%	24%	35%	10%	11%	8%	-7%	-30%	-15%

Comparing low SES with medium-to-high SES; ns = not statistically significant

Main points … discussion

↗ **Individual-level and area-level SES differences in perceived barriers to PA**

- Time barriers vs. other barriers

- Significant but small effect sizes (measurement problems?)

↗ **SES-differences in barriers and PA accounted by psychosocial as well as environmental factors**

- Need for multilevel educational and environmental intervention strategies

↗ **Promoting transport-related PA to those facing health, skill and facilities barriers (lower SES)**

Thank You!

Chief Investigators:

Prof. Neville Owen, University of Queensland
Prof. Adrian Bauman, University of Sydney
Prof, Gaeme Hugo, University of Adelaide