



**Physical Activity in Localities
and Community Environments**

Social Disadvantage and Low-Walkable Neighborhoods are Associated with Canine Physical Inactivity, and with Inactivity and Obesity among their Owners

**Adrian Bauman 1, Neville Owen², Takemi Sugiyama 2, Lorinne DuToit 2
with assistance from SJ Russell**

[1] Centre for Physical Activity and Health, School of Public Health, University of Sydney, Australia

[2] Cancer Prevention Research Centre, School of Population Health, The University of Queensland, Australia

PLACE : Physical Activity in Localities and Community Environments

NHMRC Project Grant, 2002-2004

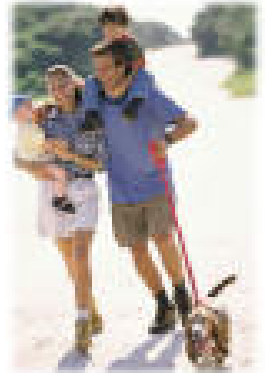
Owen N, Bauman A, Hugo G et al

Overall purpose of the PLACE study is:

to identify relationships between local community environments and human physical activity [PA]

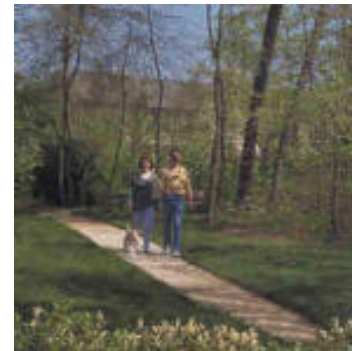
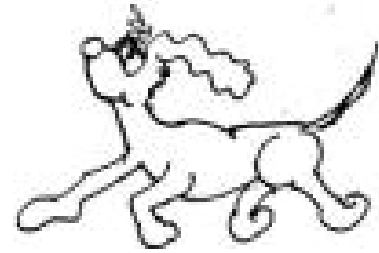
to investigate 'walkable' communities association with PA, after adjusting for socio-economic status





No photos of

Dog walking and physical activity



Background to this work

- Historical work by S.J.Russell
- **Cutt H, 2007 Health and Place – review paper observed that there was “limited evidence on the physical environmental and policy-related factors that affect dog owners walking with their dog”.... high prevalence of dogs in households is relevant to social environment, physical and policy environments ...[to promote PA]**
- **Diverse findings whether dog owners are more active [Brown S, Amer J Prev Med 2006]**
- **Rates of “dog walking” among dog owners are generally sub-optimal for human and canine health [Thorpe R, J Amer Geriatric Soc 2006]**
- **Need for better designs to provide causal evidence , not just associations, on the ‘broad health and social’ benefits of pets [McNicolas J, BMJ 2005]**

Research idea for this analysis

- Known that dog walking [DW] may contribute to human physical activity, especially walking
- known that the physical environments of neighborhoods influence human walking

But:

- 1. Do human environments influence dog walking ?**
- 2. Do these vary by human socio-economic status ?**

What are the implications for canine & human health

PLACE Study

Study design:

32 neighbourhoods in the metropolitan area of Adelaide, Australia

2700 adults aged 20-65, randomly selected from 32 neighborhoods, selected as :

high walkable; high SES (n = 8) neighborhoods

high walkable; low SES (n = 8) neighborhoods

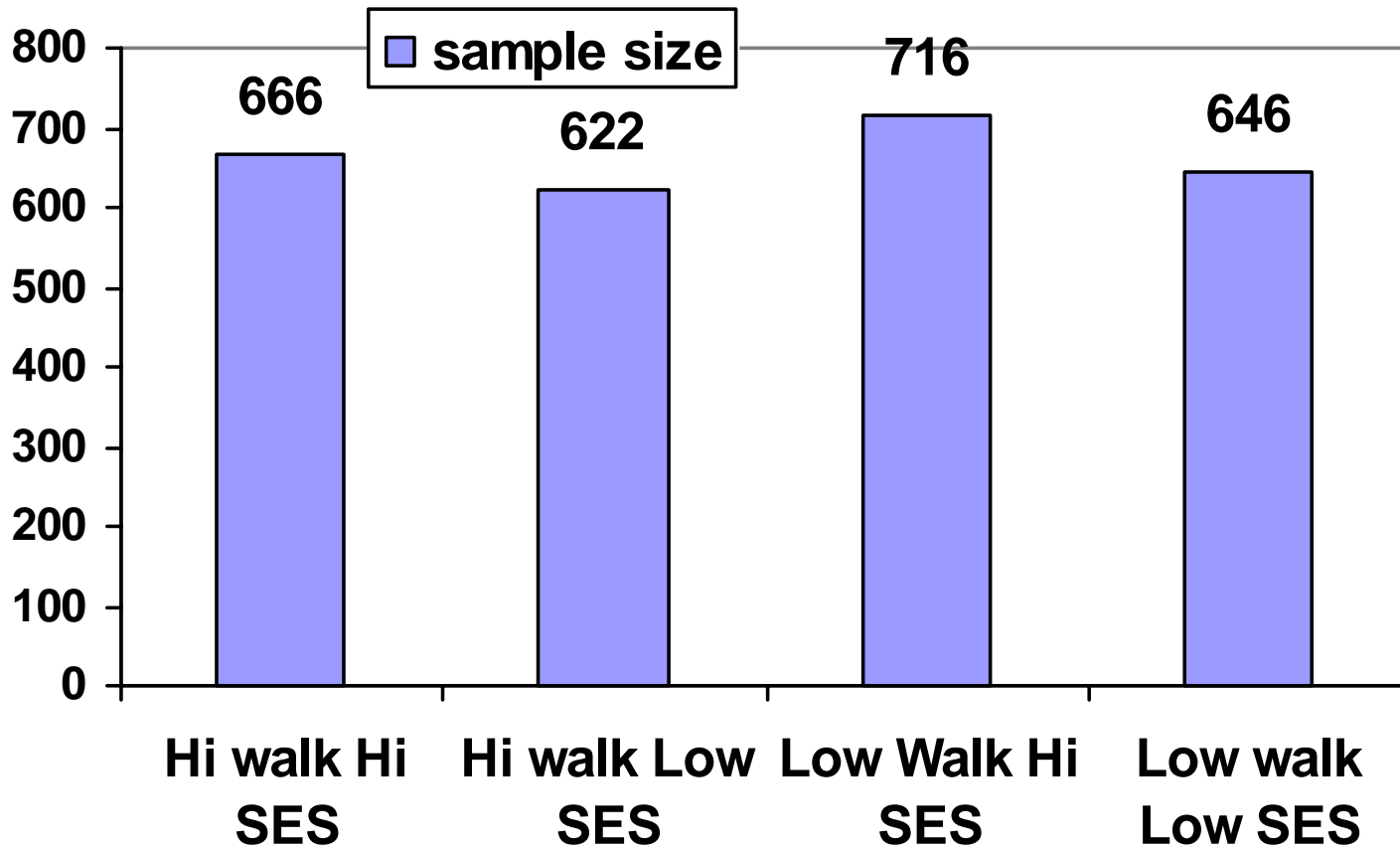
low walkable; high SES (n = 8) neighborhoods

low walkable; low SES (n = 8) neighborhoods

Measures used in this study

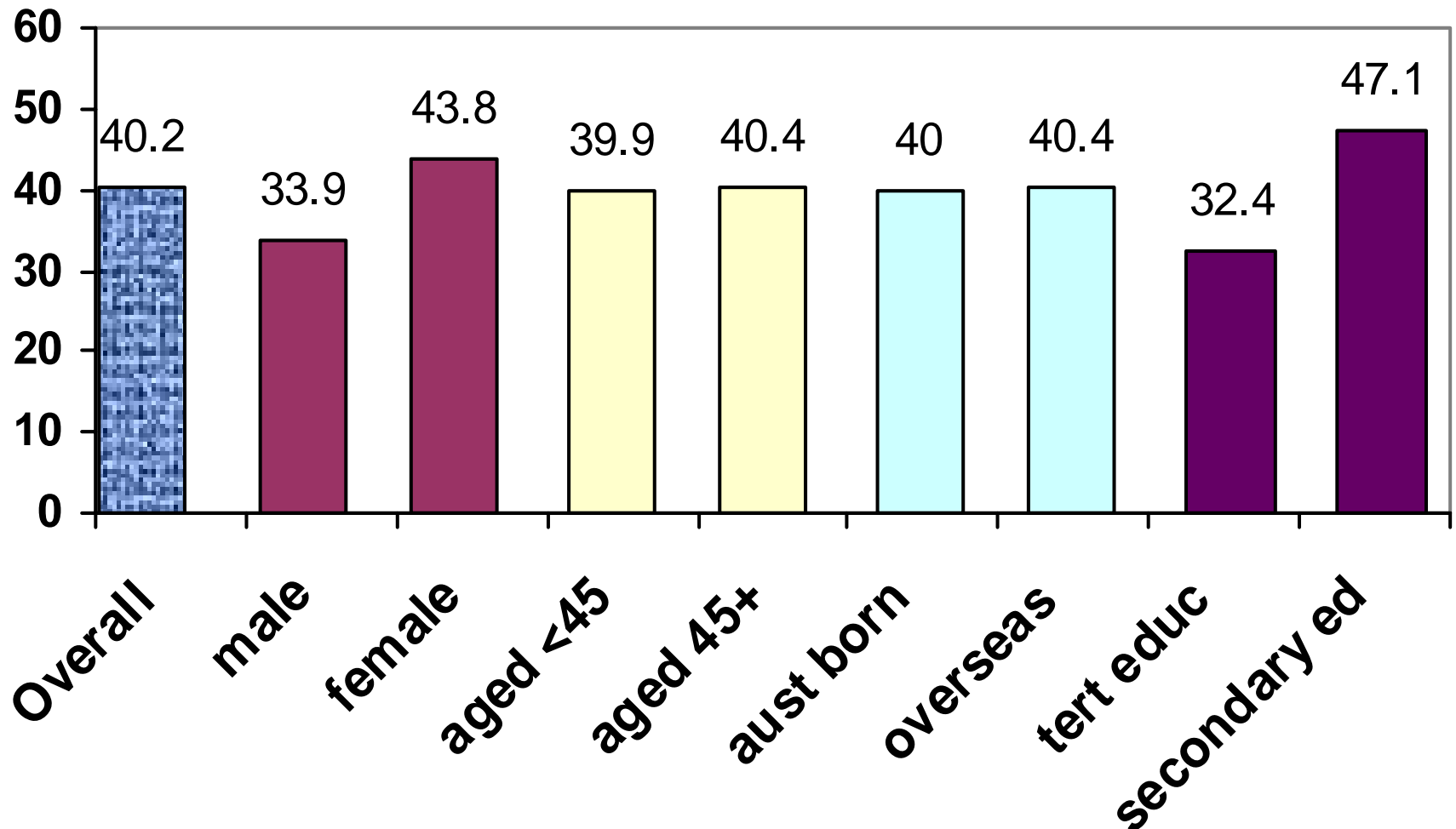
- *Physical activity questions (IPAQ long); other related PA questions by domain*
- *Dog ownership, dog walking*
- *Measures of socio economic status [derived from individual-level median income] – low / high income*
- *Walkability index using GIS; using scores derived from residential density, street connectivity, land use, and retail area ratio; then divided into low- and high-walkable neighborhoods*
- *Self reported environmental perception scores*

Quartiles of walkability and socio-economic status

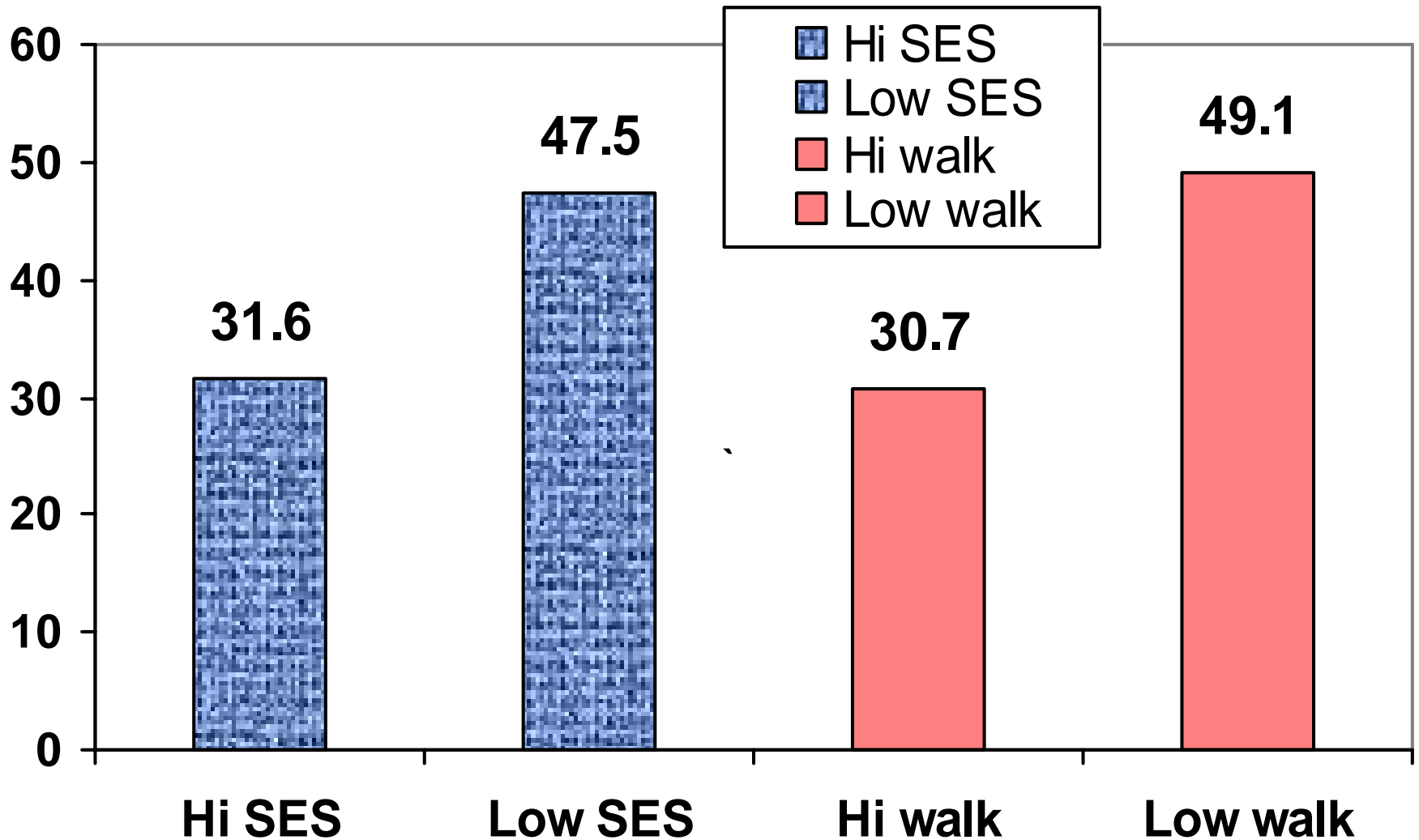


Total n=2690 [dog data on n=2650]

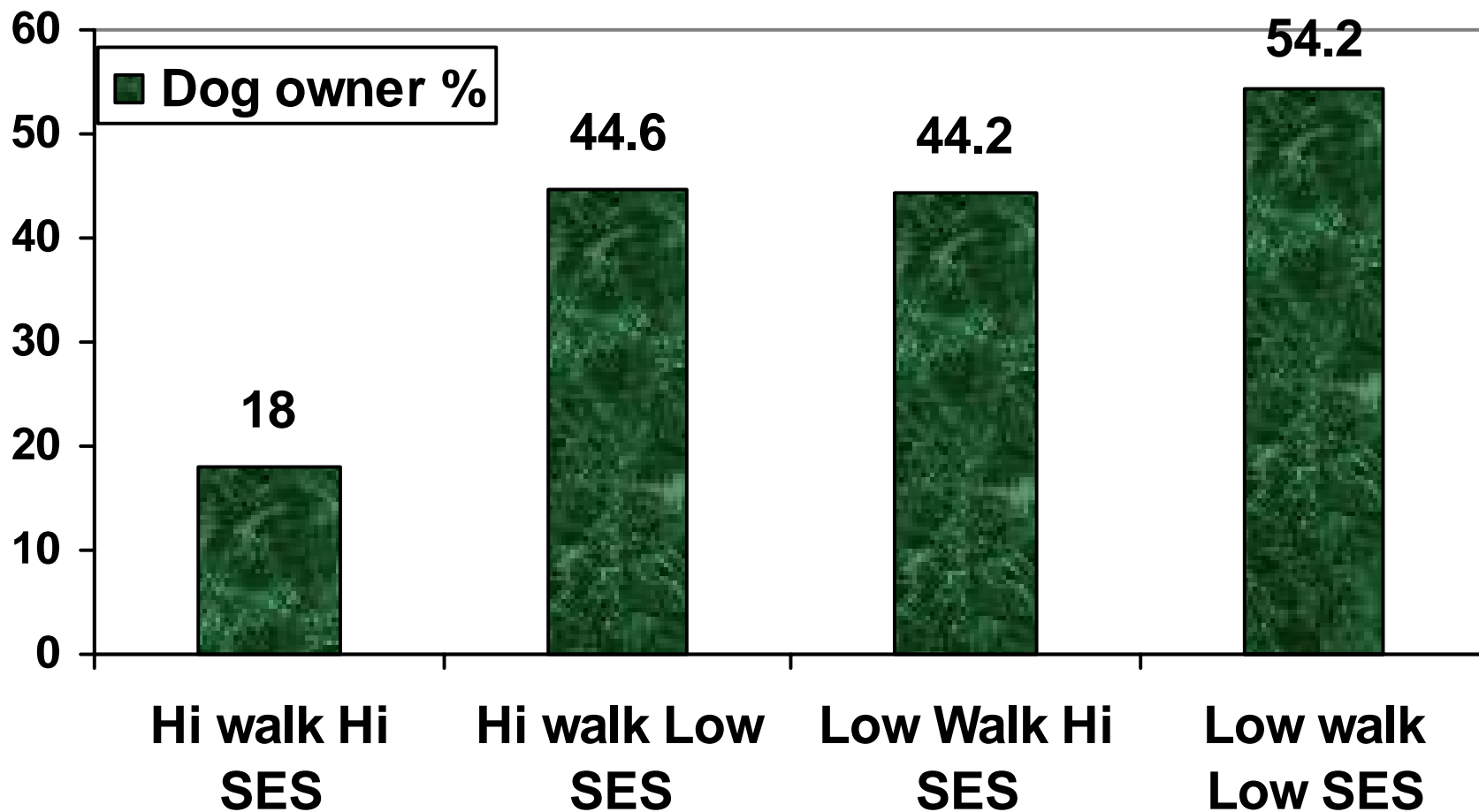
Dog ownership rates by demographic characteristics of humans



Dog ownership rates by human SES and by environmental walkability

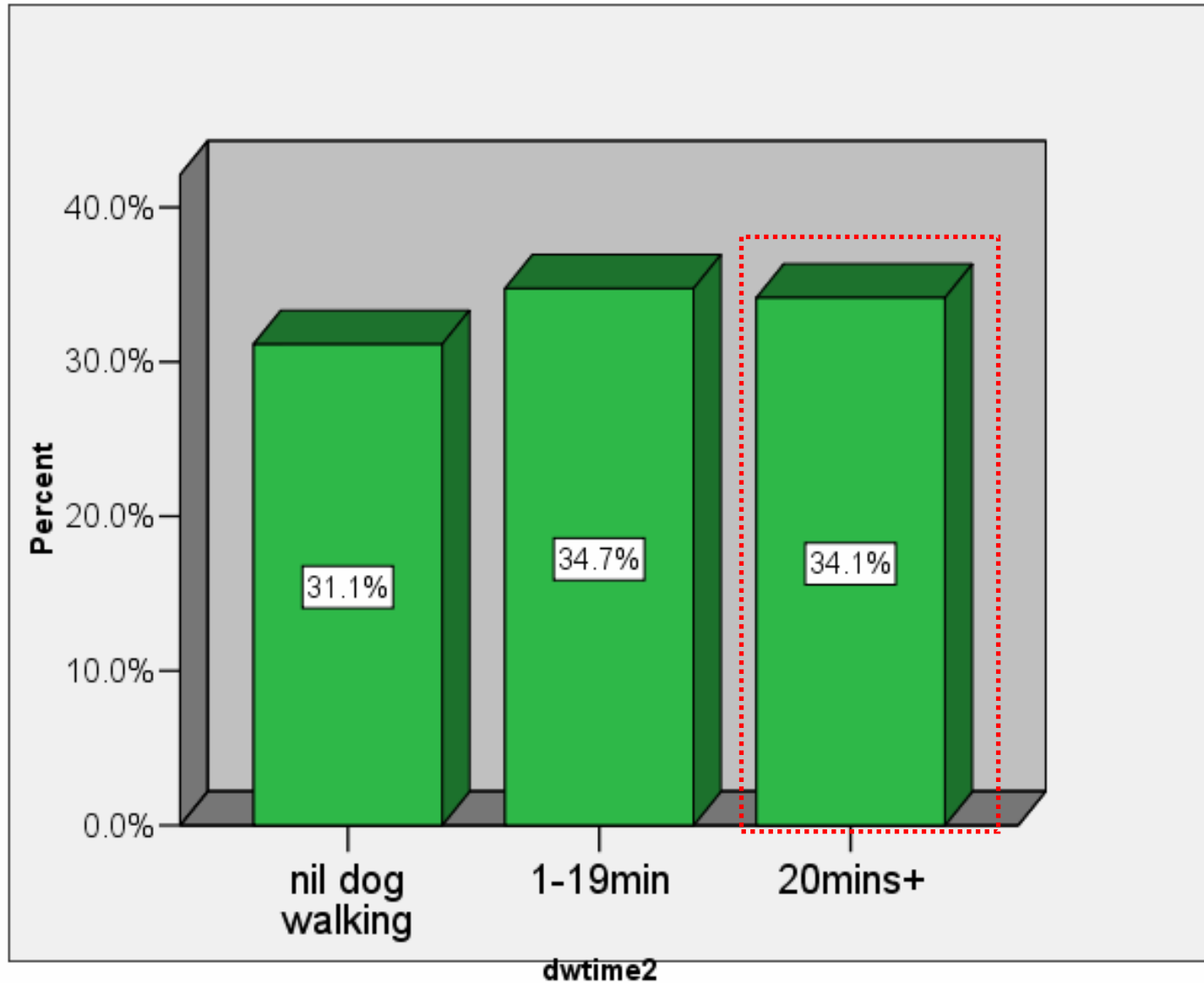


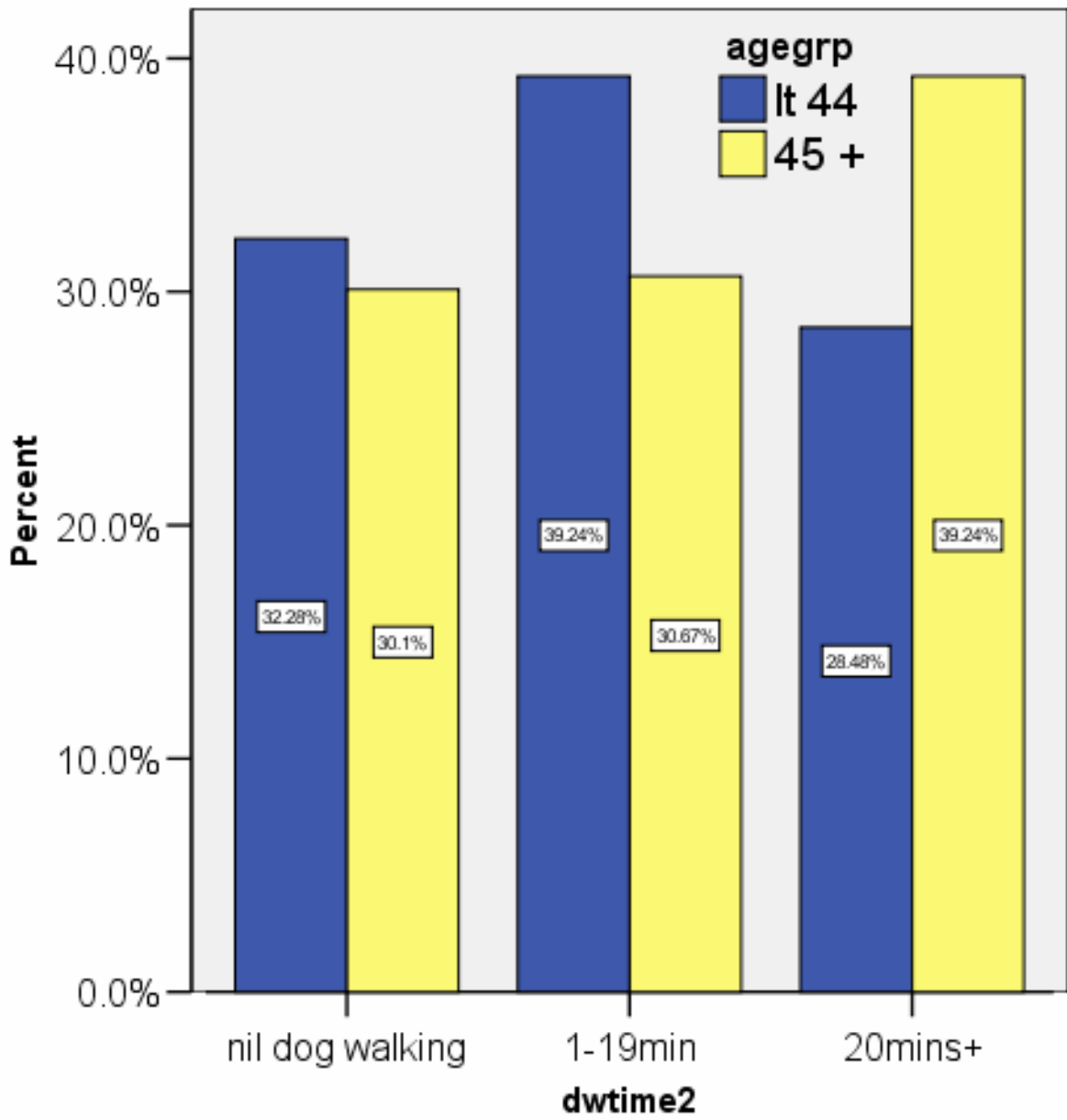
Dog ownership by SES and walkability



Prevalence of dog walking

Dog walking rates among 1040 dog owners

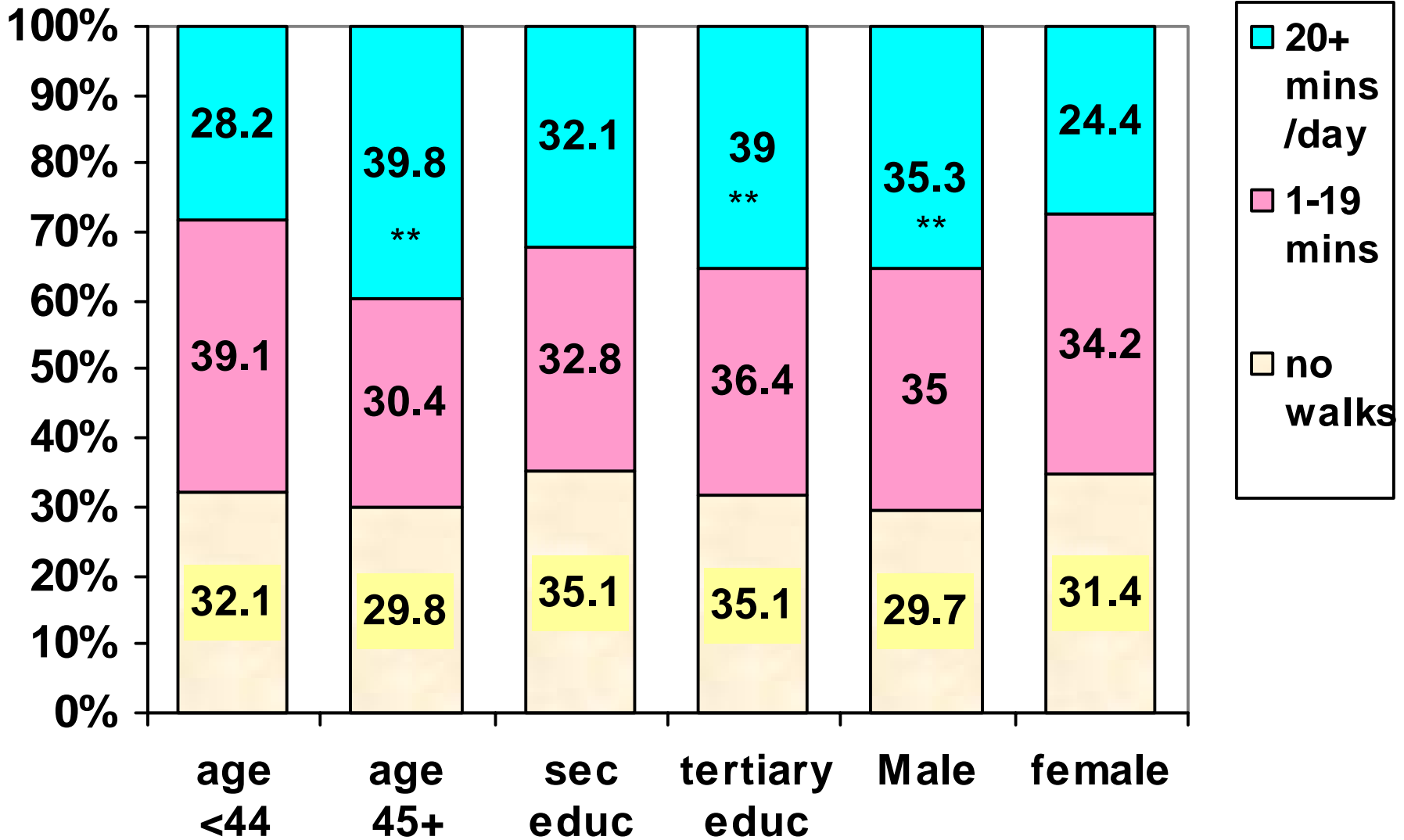




Dog walking by age

Also DW 20mins was higher among males, and people with tertiary education

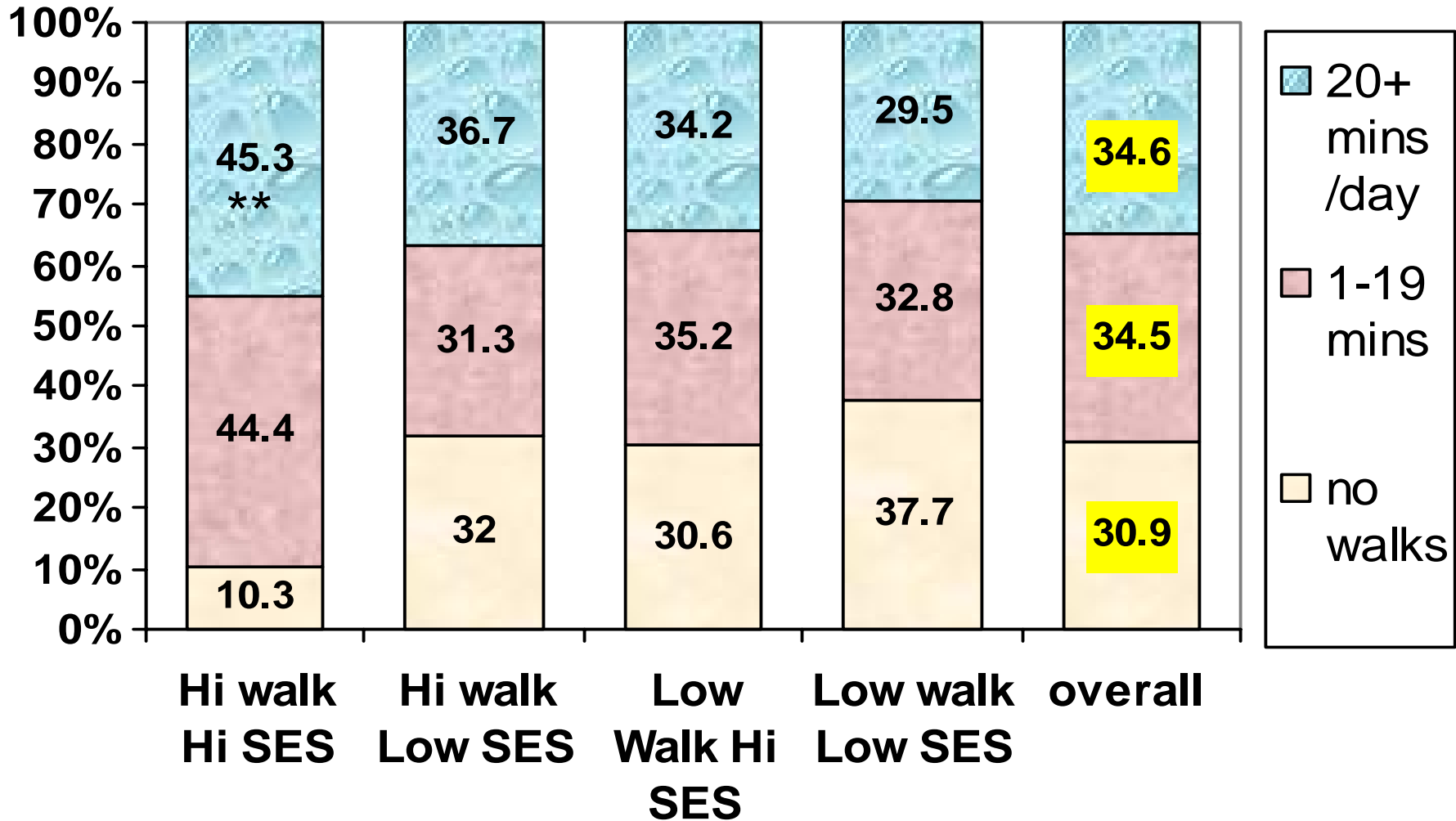
Dog walking by human demographic factors



N=1040 dog owners

** p<.01

Dog walking by walkability and SES

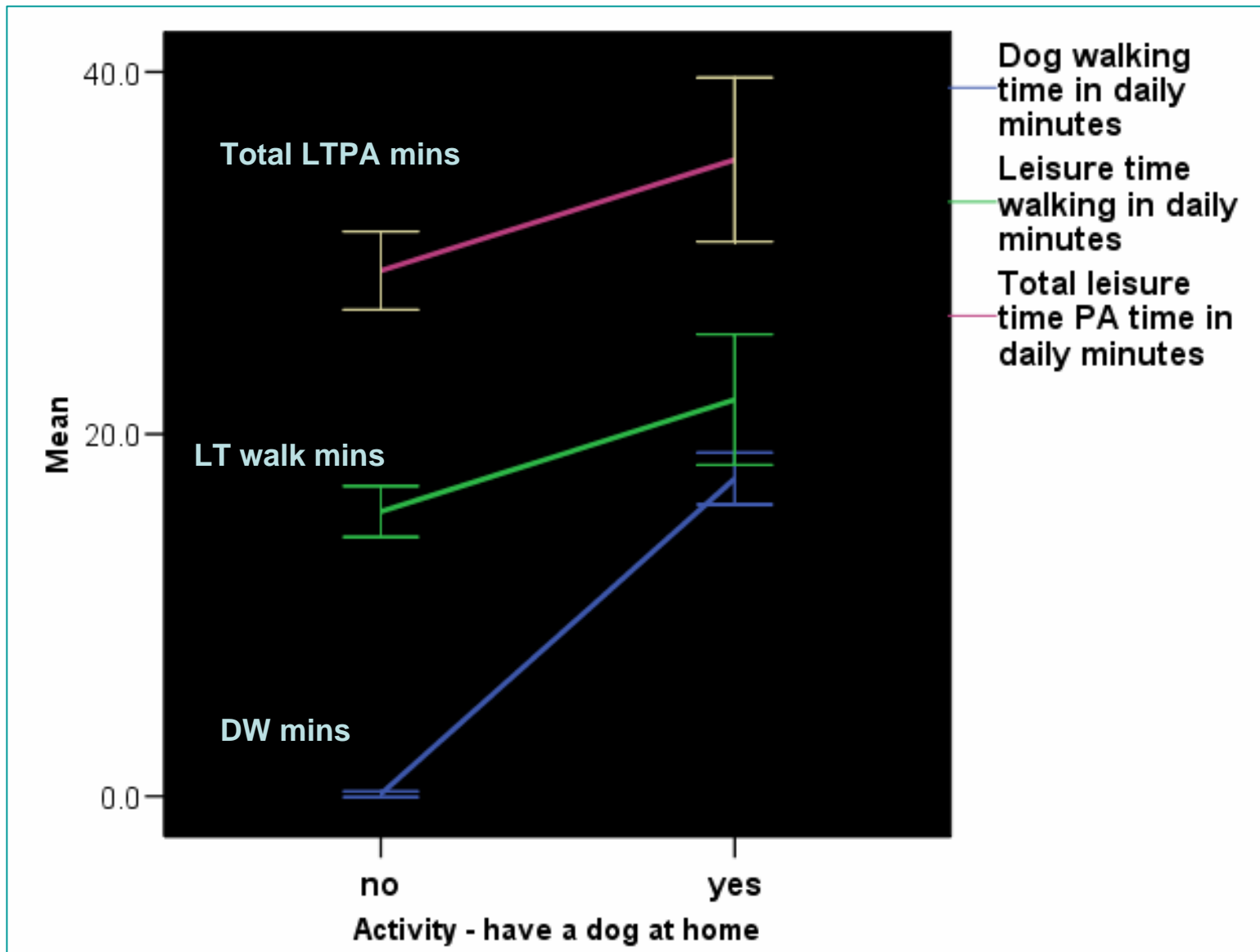


N=1040 dog owners

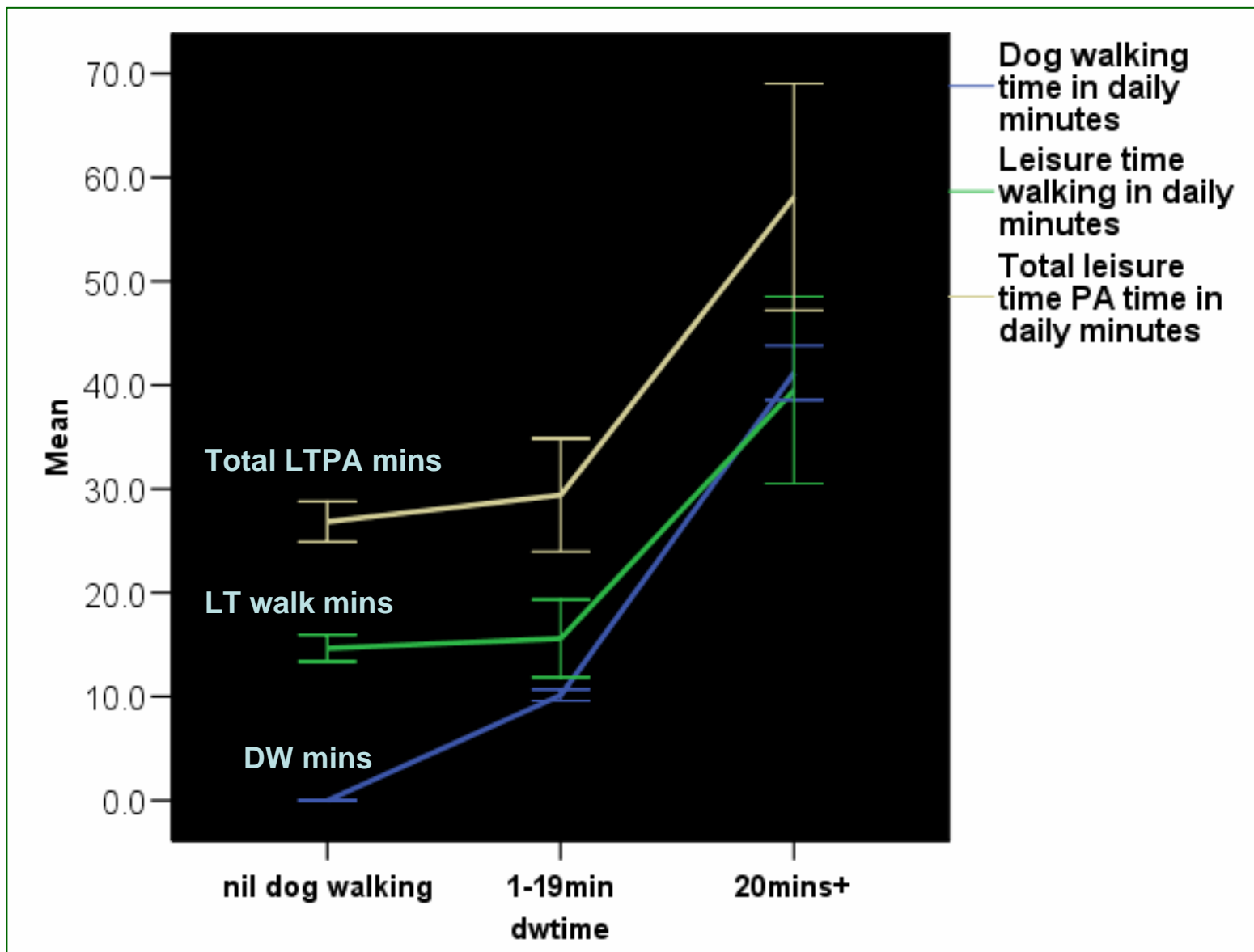
** p<.01

*Dog walking and total human
leisure time physical activity*

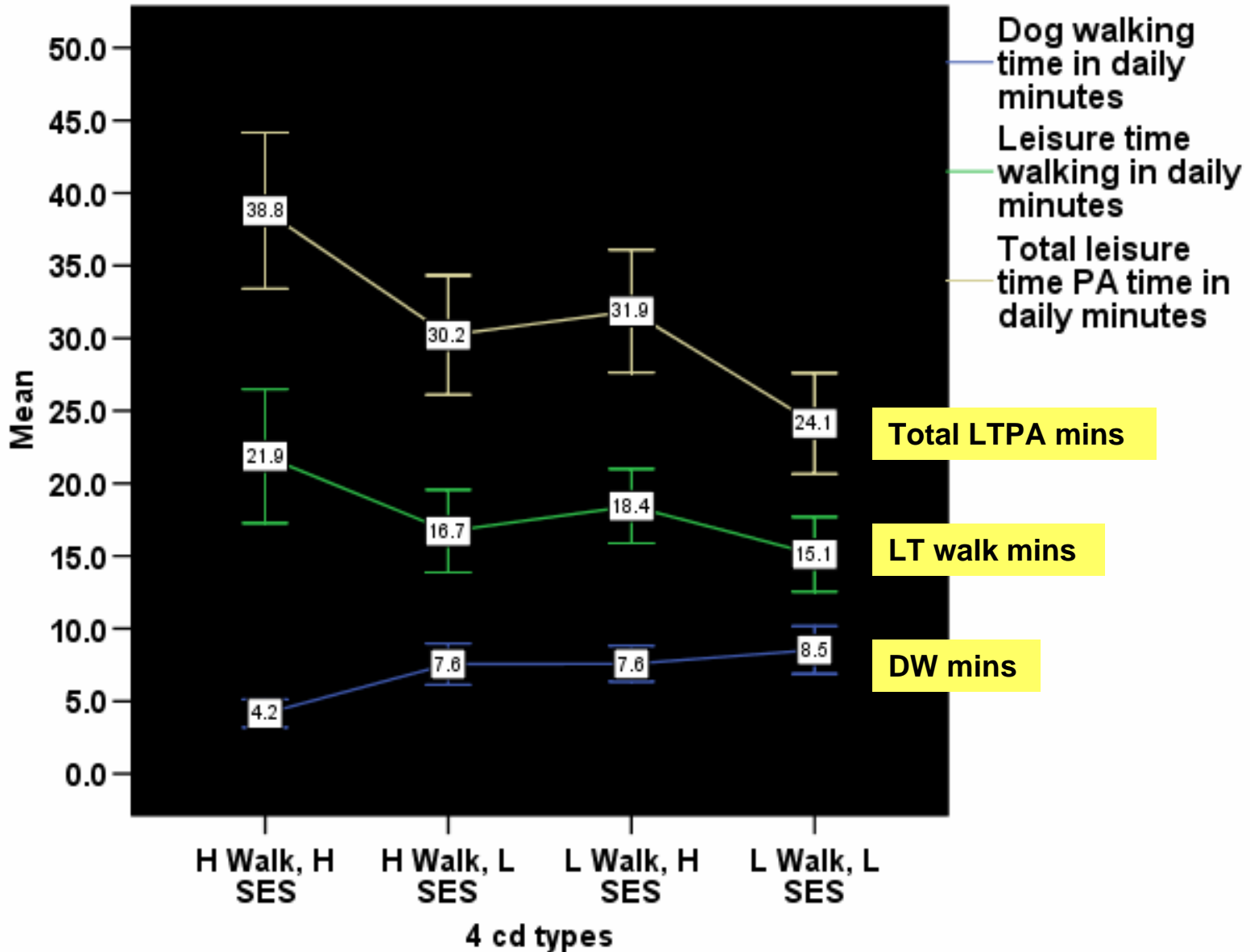
Do those with a dog report more total LT walking and total LTPA minutes daily ?

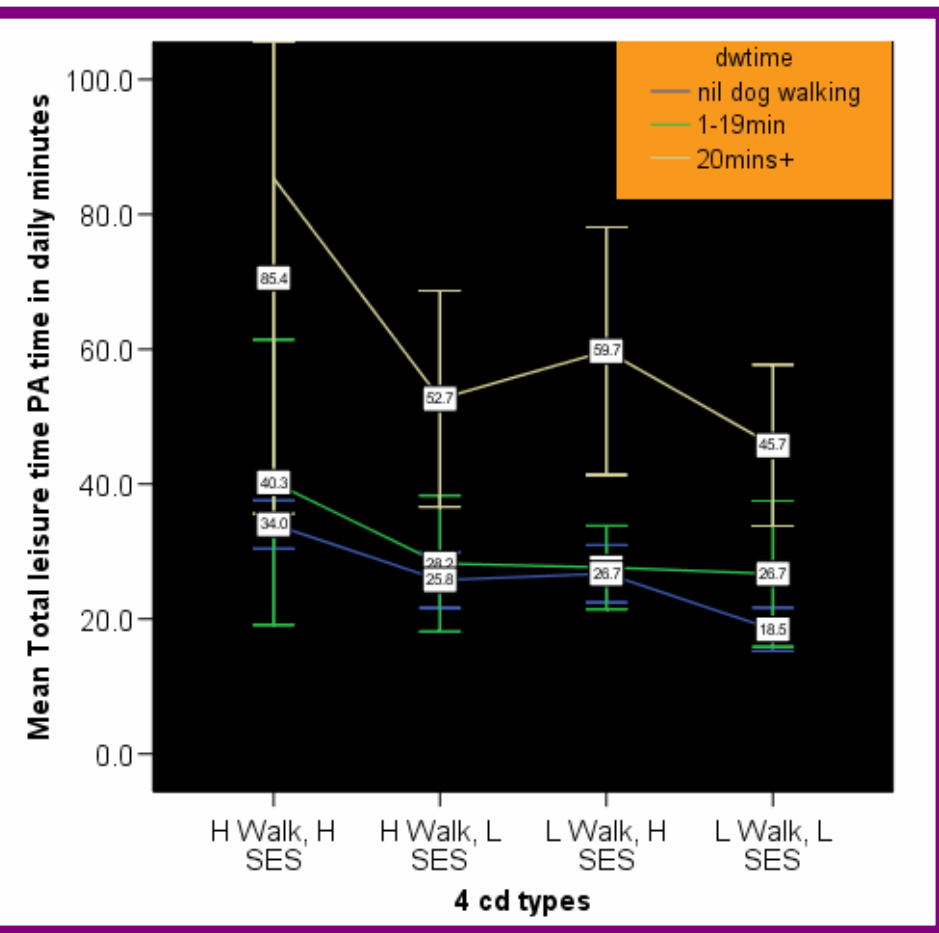
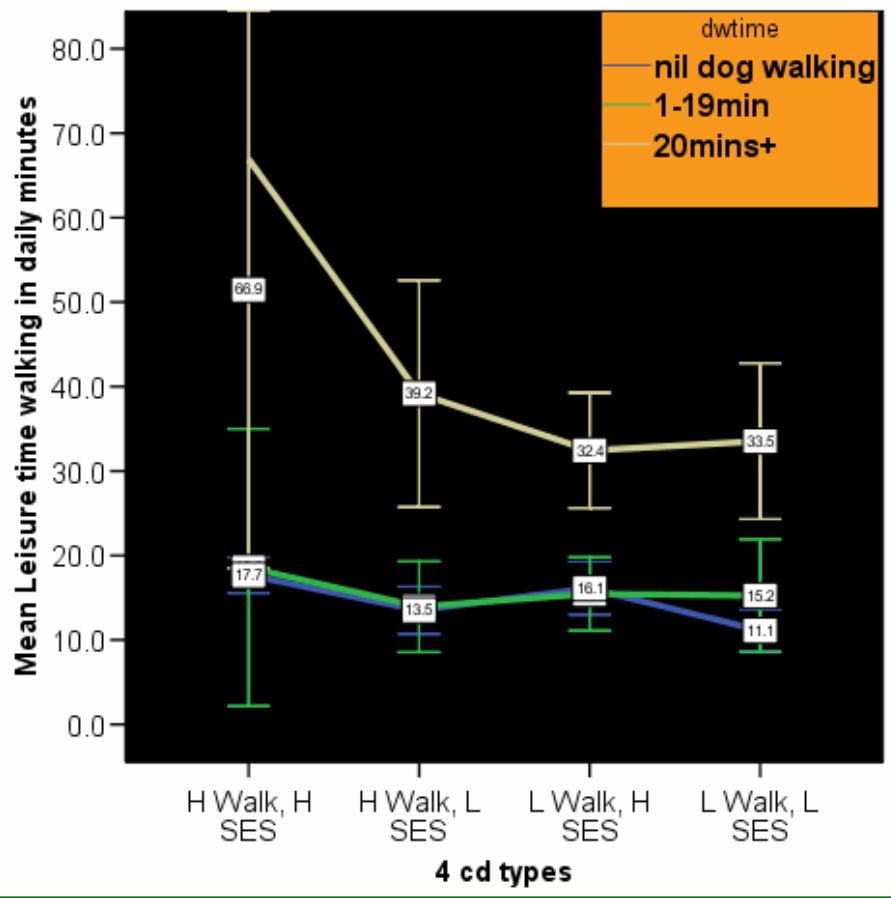


Dose response : how does dog walking time contribute to total LTPA and walking for leisure ?

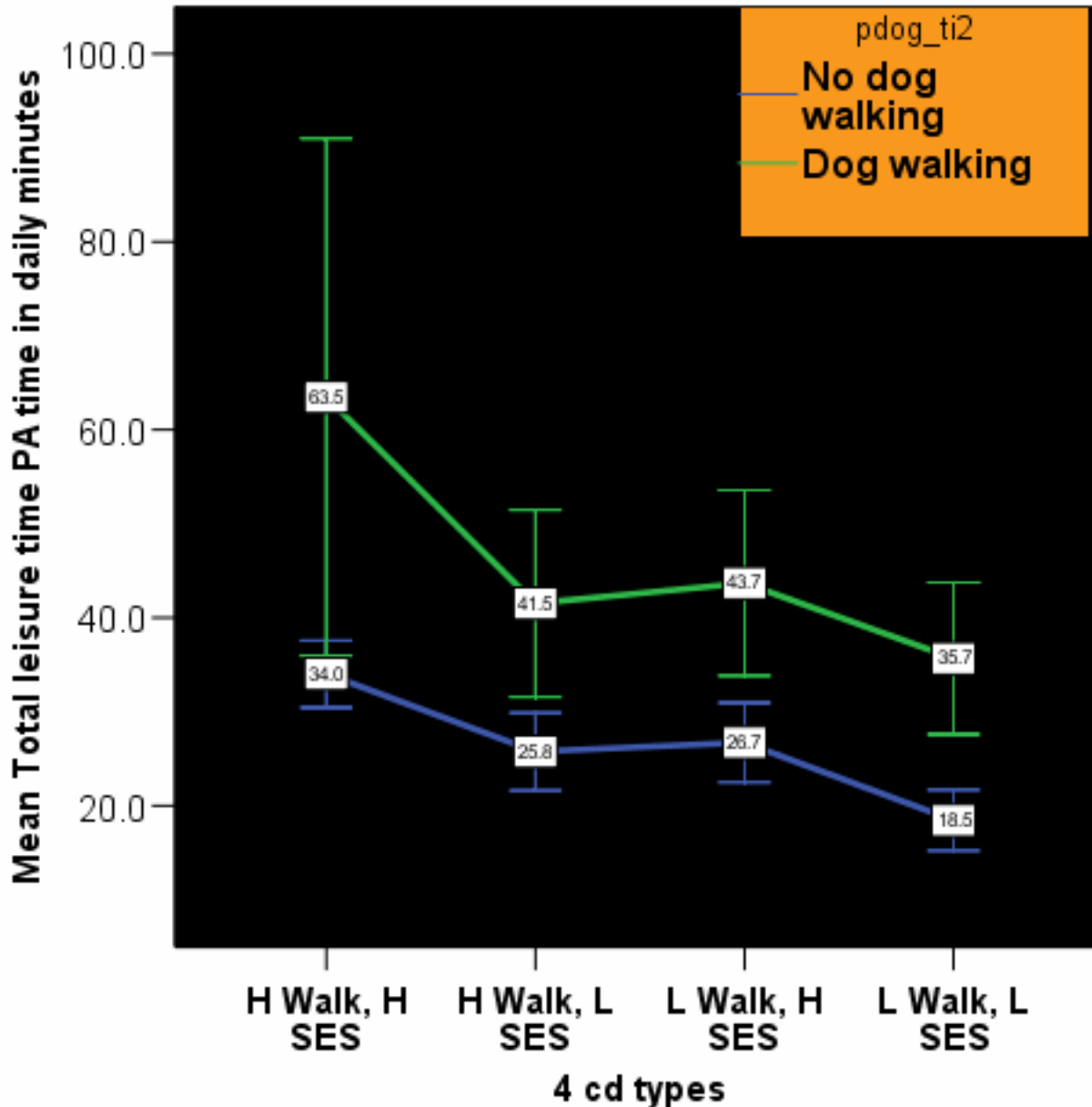


Dog walking and LTPA mins in the population: relationship to objective measure of walkability and SES





Effect of any dog walking on LTPA total minutes –compared to no dog walking



GLM results

$F_{\text{dog}} = 59.4, 1 \text{ df}, p < 0.01$

$F_{\text{ses/walk}} = 10.9, 3 \text{ df}, p < 0.01$

Interaction $F = 1.27, \text{ NS}$

Conceptual model

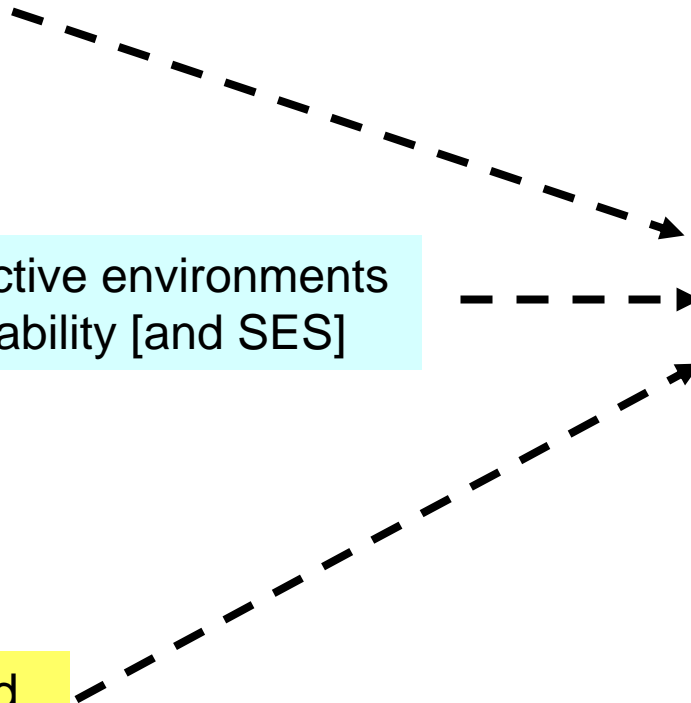
– associations for preliminary testing

Dog walking

Objective environments
Walkability [and SES]

Self reported
Environments

Measures of walking
and physical activity



Self rated environmental perception items

Self rated environmental scale	# items	Cronbach alpha [α]	Mean score *
Proximity to shops and walking places	4	.58	14.2 [3.8]
Access to shops, paths	3	.86	9.9 [2.5]
Presence of walking facilities	8	.76	25.3 [4.1]
Pleasant features - aesthetics	6	.81	18.1 [3.8]

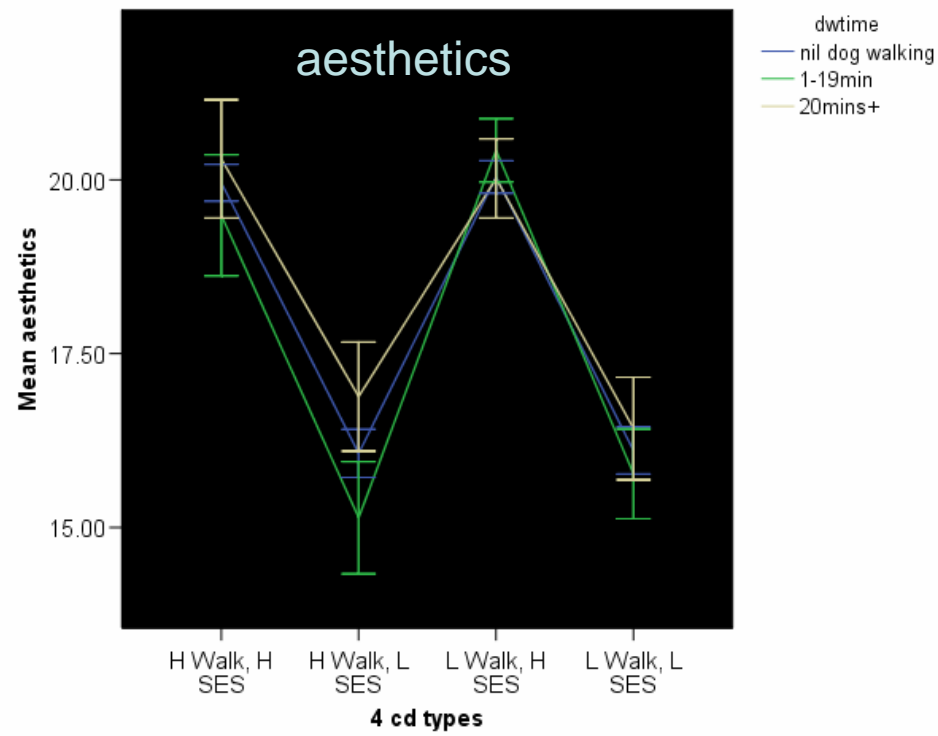
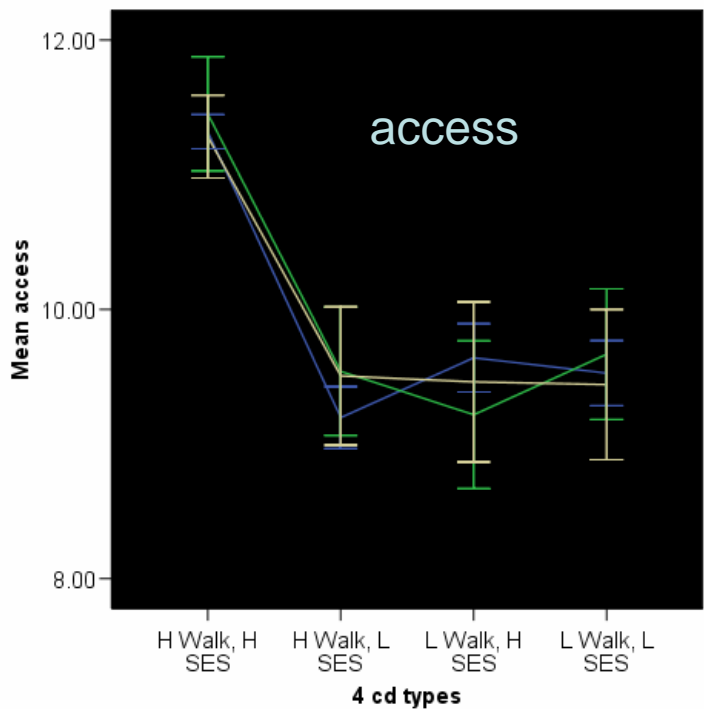
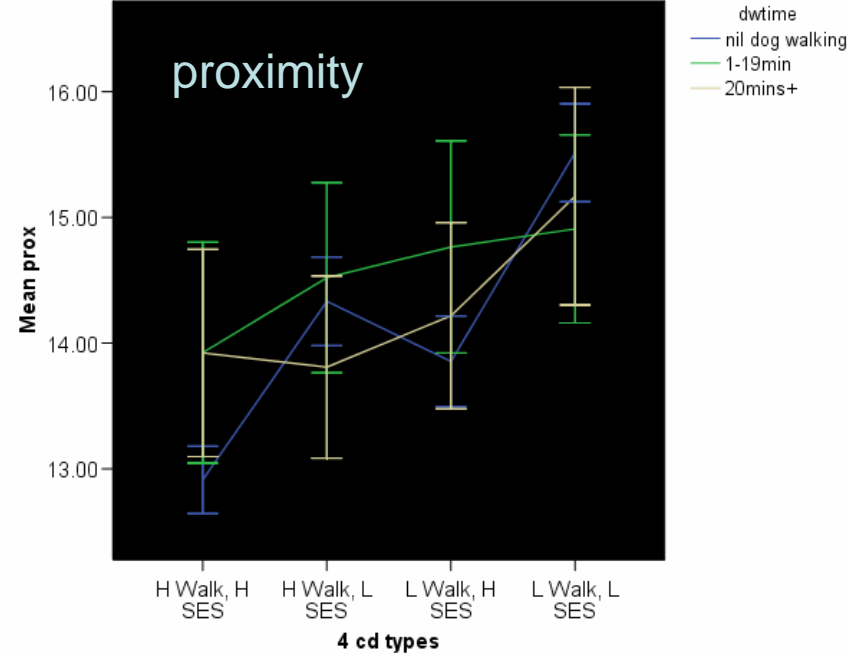
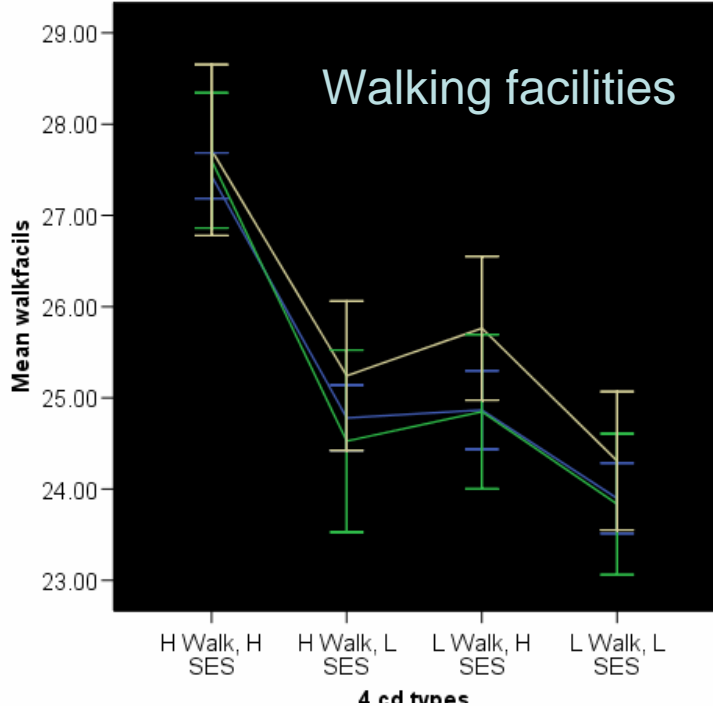
* Higher score is more positive environmental perception

[in later analyses, highest tertile of these scores in analysis]

Self rated environmental perception items – association with dog walking and LTPA

			Correlations [nonparametric] with dog walking, LTPA, walkability and BMI			
Self rated environmental scale	# items	Cronbach alpha [α]	dog walking mins	Total LTPA mins	BMI	Walkability and SES
Proximity to shops and walking places	4	.58	*		**	**
Access to shops, paths	3	.86	*		**	**
Presence of walking facilities	8	.76			**	**
Pleasant features - aesthetics	6	.81		*	**	**

* $P < .05$ ** $p < 0.01$



Outcome variables

Population level

- Does dog walking help humans to meet their 30 mins LTPA per day [n=860 34% of total sample]
- Does lack of dog walking contribute to human BMI [obesity level]

Among dog owners

- What are the correlates of humans who walk their dogs >20 mins/day [n=343, among 1040 dog owners]

Model Ia. Likelihood of achieving LTPA 30 mins/day

Variable	Adjusted OR	95%CI
Age <45	1.0	
45+	.99	.83 -1.19
Gender M	1.0	
F	.72	.61 - .87
<i>Have dog no</i>	<i>1.0</i>	
<i>yes</i>	<i>1.91</i>	<i>1.57-2.31</i>
Education sec	1.0	
at least 3⁰	1.49	1.23-1.79
Hi W, hi SES	1.0	
HWLS	.66	.51-.85
LWHS	.77	.61-.98
LWLS	.53	.40 -.69

Rent NS
ethnicity NS

Model Ib. Likelihood of LTPA 30 mins/day – self report environmental perceptions

Variable	Adjusted OR	95%CI
<i>Have a dog</i>	1.83	1.51 - 2.21
High proximity	.87	.71 - 1.06
High access	1.39	1.16 – 1.68
High walk facils	1.22	1.01 – 1.48
High aesthetics	1.28	1.06 – 1.56

all self report environ scores modeled as highest tertile compared to lower 2/3; adjusted for age sex, education

Model 1c. Likelihood of LTPA 30 mins/day – both GIS and self report environmental perceptions

Variable	Adjusted OR	95%CI
Have a dog	1.88	1.55 - 2.27
High proximity	.88	.72 - 1.09
High access	1.35	1.10 – 1.63
High walk facils	1.19	.98 – 1.44
High aesthetics	1.24	1.01 – 1.52
Hi W, hi SES	1.0	
HWLS	.91	.68 - 1.19
LWHS	.87	.69 – 1.12
LWLS	.73	.55 - .97

Modeled highest tertile on reported environ scales ; adjusted for age, sex, education

Model Id. Likelihood of LTPA 30 mins/day – both GIS and self-report environ & dose Dog walking

Variable	Adjusted OR	95%CI
Walk dog nil daily	1.0	
1-19 mins	.99	.76 – 1.30
20 mins+	3.05	2.72 - 4.15
High proximity	.89	.7 -1.1
High access	1.34	1.1- 1.6
High walk facils	1.16	.9 – 1.4
High aesthetics	1.20	1.0 – 1.5
Hi W, hi SES	1.0	
HWLS	.87	.6 - 1.2
LWHS	.87	.7 – 1.1
LWLS	.72	.5 - .9

Modeled highest tertile on reported environ scales ; adjusted for age, sex,education

Model 2. Obesity risk: Likelihood of BMI >25– GIS derived characteristics, Dog walking and LTPA30

Variable	Mean BMI	Adjusted OR	95%CI
Walk dog no	26.2	1.0	
yes	26.1	.9	.8 – 1.1
LTPA 30mins no	26.7	1.0	
yes	25.2	.6	.5 - .8
Hi W, hi SES	24.8	1.0	
HWLS	26.9	2.1	1.6 – 2.8
LWHS	26.1	1.7	1.4 – 2.3
LWLS	27.2	2.4	1.8 – 3.2

* *significant associations with age, gender, education*

Non-signif associations with perceived environments

Separate models – dose of Dog walking [20 mins +] – also NS for obesity

Model 3. DOG OWNERS [N=1040] Likelihood of LTPA 30 mins/day –GIS, self report env & dose Dog walking

Variable	Adjusted OR	95%CI
Walk dog nil daily	1.0	
1-19 mins	1.4	.9 - 2.0
20 mins+	5.1	3.5 – 7.4
Age > 45	.8	.6 – 1.1
Gender female	.7	.5 - .9
Education tertiary	1.5	1.1 – 2.1
Hi W, hi SES	1.0	
HWLS	.8	.5 – 1.5
LWHS	.9	.6 – 1.6
LWLS	.8	.5 – 1.4

Note: reported environ scales - high aesthetics and high proximity both p=0.06

Dog owners [n=1040] – what are the correlates of reaching “20 mins dog walking per day” ?

- Bivariate analyses
 - older > younger
 - gender NS
 - Tertiary education > secondary education
 - HWHS > other 3 categories walkability & SES
 - high access > low
 - High walking to facilities perceptions
 - high aesthetics

Dog owners [n=1040] – what are the correlates of getting to 20 mins dog walking per day ?

	Full model	
Variable	Adjusted OR	
Age > 45	1.5 [1.2-2.1]	
Gender female	1.1 [.8-1.4]	
Education tertiary	1.2 [.9 -1.6]	
Hi walking facils	1.38 [1.02 -1.87]	
Hi aesthetics	1.41 [1.01 -1.99]	
Hi W, hi SES		
HWLS	1.06 [.63 – 1.75]	
LWHS	.76 [.47 – 1.22]	
LWLS	.80 [.48 – 1.32]	

Other environ self report measures, proximity and access NS

Dog owners [n=1040] – what are the correlates of getting to 20 mins dog walking per day ?

	Full model	Model without perceived environs
Variable	Adjusted OR	Adj OR
Age > 45	1.5 [1.2-2.1]	1.6 [1.2 – 2.1]
Gender female	1.1 [.8-1.4]	1.0 [.8 – 1.4]
Education tertiary	1.2 [.9 -1.6]	1.3 [.9 – 1.7]
Hi walking facils	1.38 [1.02 -1.87]	
Hi aesthetics	1.41 [1.01 -1.99]	
Hi W, hi SES		1.0
HWLS	1.06 [.63 – 1.75]	.8 [.5 -1.3]
LWHS	.76 [.47 – 1.22]	.6 [.4 -1.0]
LWLS	.80 [.48 – 1.32]	.6 [.4 - .9]

Other environ self report measures, proximity and access NS

Dog owners [n=1040] – what are the correlates of getting to 20 mins dog walking per day ?

	Full model	Model without perceived environs	Model without walkability
Variable	Adjusted OR	Adj OR	Adj OR
Age > 45	1.5 [1.2-2.1]	1.6 [1.2 – 2.1]	1.6 [1.1 – 2.0]
Gender female	1.1 [.8-1.4]	1.0 [.8 – 1.4]	1.1 [.8 -1.5]
Education tertiary	1.2 [.9 -1.6]	1.3 [.9 – 1.7]	1.2 [.7 – 1.3]
Hi walking facils	1.38 [1.02 -1.87]		1.4 [1.1-1.9]
Hi aesthetics	1.41 [1.01 -1.99]		1.3 [1.0 -1.7]
Hi W, hi SES		1.0	
HWLS	1.06 [.63 – 1.75]	.8 [.5 -1.3]	
LWHS	.76 [.47 – 1.22]	.6 [.4 -1.0]	
LWLS	.80 [.48 – 1.32]	.6 [.4 - .9]	

Other environ self report measures, proximity and access NS

Conclusions 1

- Dog walking insufficient for dog health
- Variations with objective environments
 - **Varies by SES and walkability – but only high on both is facilitatory for dogs**
 - **Dogs should choose wealthy humans resident in high walkability neighborhoods**
 - **Other combinations not good enough: high SES but low W, or high W and low SES often not different to Low W Low SES**

Conclusions 2

- Dog walking less clearly related to population obesity risk
- Dog owners get to their 30 minutes with the assistance of their best friend
- Correlates of getting to “20 mins daily dog walking” among dog owners vary – it seems that environmental perceptions may contribute as much as objective environmental measures

Thank you for your attention
and please walk me more.....

