Correlates of Walking Behavior in Istanbul: Individual Attributes, Neighborhood Context and Perceived Safety

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Overview

1. Background
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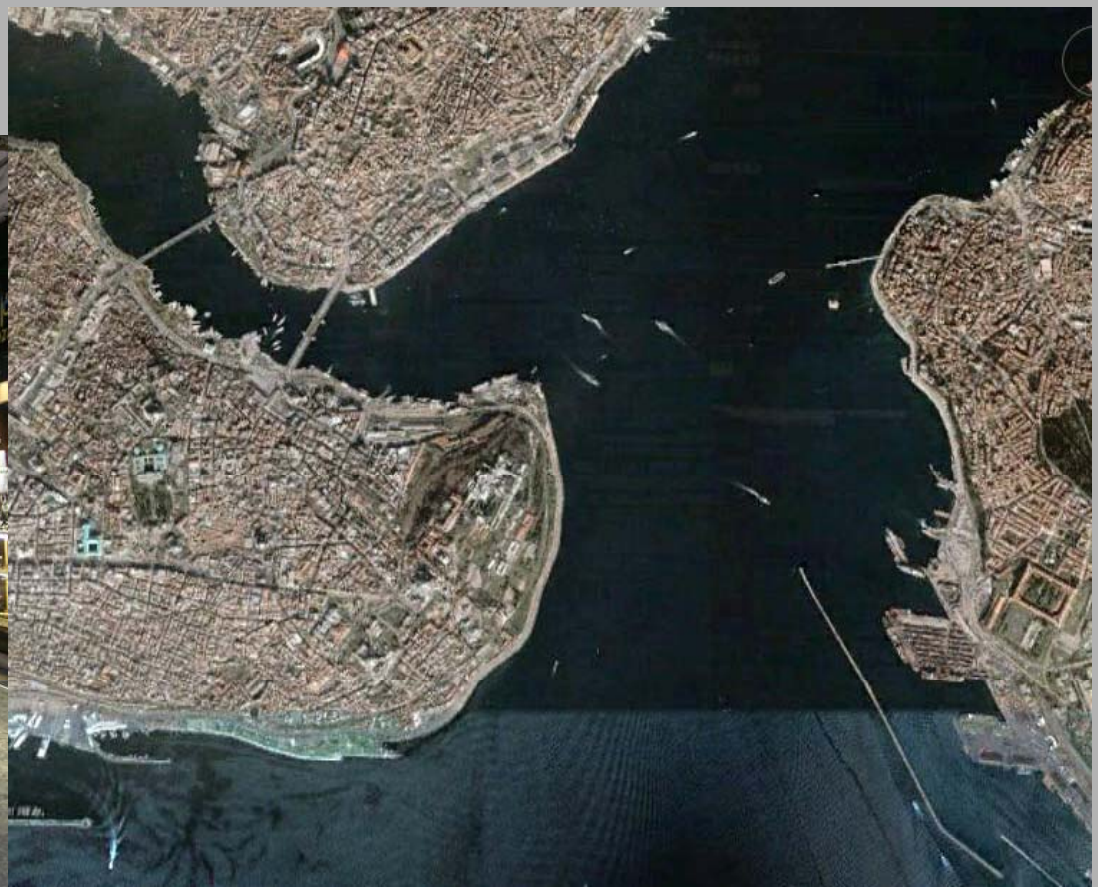
4. Results



1. Background

The **Measuring of the Quality of Urban Life in Istanbul** study
2005-2006

Funded by

- The Strategic Planning Unit at the Greater Istanbul Municipality
- Istanbul Technical University Research Foundation

Istanbul population: 11,372,613 (2007)

Measuring of the Quality of Urban Life in Istanbul

Residents' Perceptions of and Attitudes towards various Dimensions or Urban Life

Quality of life
Quality of neighborhood
Public services and facilities
Commercial facilities
Environment and conservation of open land
Residential history, mobility and preferences
Travel behavior
Community involvement and participation
Neighboring
Perceived safety
Parks and recreation services
Family health status
Physical activity
Walking behavior

Health

Population in Turkey:
56% overweight
16% obese
(Işeri & Arslan, 2008)

2. Study Objectives & Conceptual Framework

Contextual- level Variables

Neighborhood
- Perceived neighborhood safety
- Neighborhood social interaction

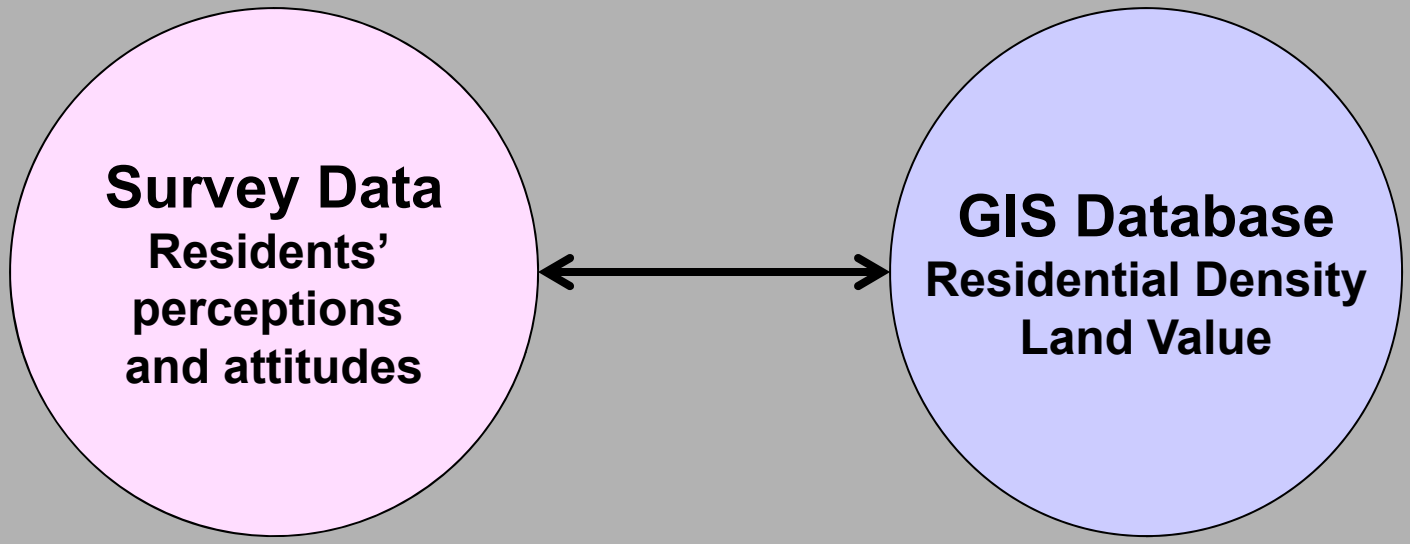
Micro-environment
- View: Physical Disorder
- View: Social Disorder
- View: Busy Place

Control Variables
- Residential density
- Land value
- Availability of public transport.
- Number of cars in household
- Satisfaction with parks/playgr.
- Satisfaction with living here
- Not a good place to walk

Individual-level Variables
- Age
- Gender
- Education
- Being retired
- Household Income
- Body Mass Index

Walking Behavior
- Utilitarian Walking
- Recreational Walking

3. Methodology



Face-to-Face Interviews with Residents, November 2005 – February 2006
Sample size: 2,484; Administered questionnaires: 1,635 (RR 66%)

ÖN BİLGİ FORMU

FORM ID NO	___ ___ ___ ___ ___ ___	*ilk 5 hane → nokta ID no olmalıdır son hane → o noktada yapılan kaçıncı anket olduğunu göstermelidir.*
ANKET NO	___ ___ ___ ___	**OFİSTE DOLDURULACAK** *1-1800 arasında numara verilecektir*
AÇIK ADRES	Sokak/ cadde: Apartman no ve ismi: Daire no: İLÇE :	

- **İyi günler, ismim .....**
- İstanbul Teknik Üniversitesi, Mimarlık Fakültesi, Şehir ve Bölge Planlaması Bölümü ve İstanbul Büyükşehir Belediyesi **İstanbul'da Yaşam Kalitesinin Ölçülmesi konusunda bir araştırma gerçekleştirmektedir.**
- Bu evde oturan ve biraz sonra görüşmeci olarak belirleyeceğim bir kişi bilimsel yollarla

KİŞİYE PROJE BROŞÜRÜNÜ VERİN ve SİZE 5 DAKİKA VAKİT AYIRMASINI RİCA EDİN

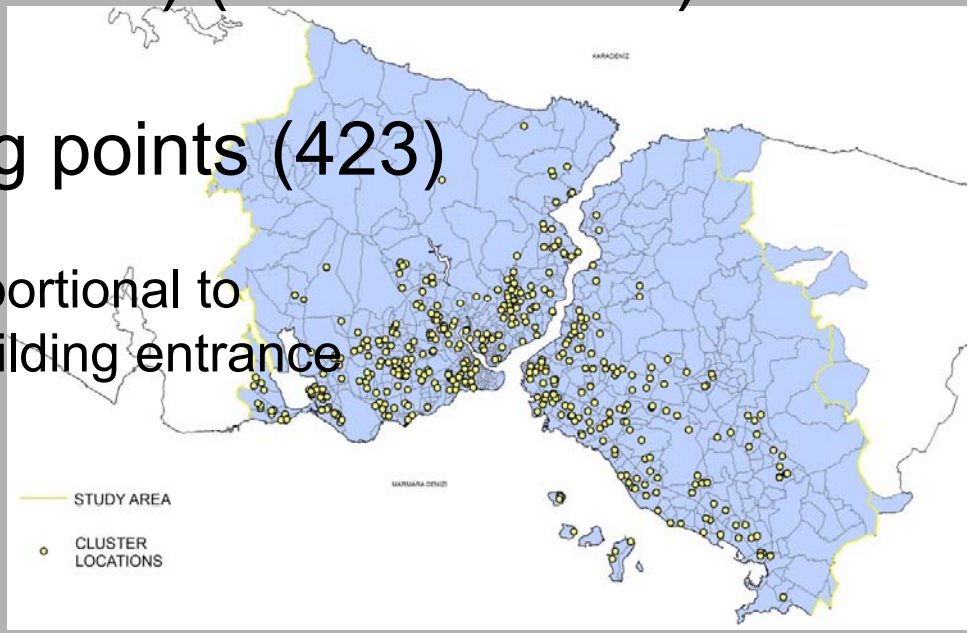
İlk ziyaret sonucu		
Evde kimse yok	1	→ Proje Mektubunu kapıya bırakın ve tekrar ziyaret etmek üzere noktadan ayrılın
Ön görüşme red edildi	2	→ teşekkür ederek ayrılın
Başka bir gün için randevu alındı	3	→ sadece ön görüşme formunu doldurmak için izin isteyin. Kabul edilmezse, Proje Mektubunu bırakın, randevu günü/saatini belirleyin; teşekkür edin ve ayrılın
Ön bilgi formu doldurduldu	4	→ devam edin

Sampling Strategy

A three-stage Stratified Cluster Sampling

a. Grouping of mahalles (wards) (737 mahalles)

b. Identify cluster beginning points (423)
   Reference: building entrances
   Systematic random selection proportional to housing units in the residential building entrance
   47 clusters per mahalle group

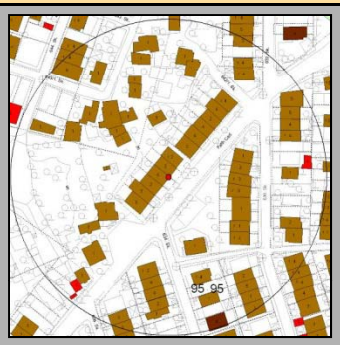


c. Identify residential units
   Systematic random selection: 6 housing units per cluster

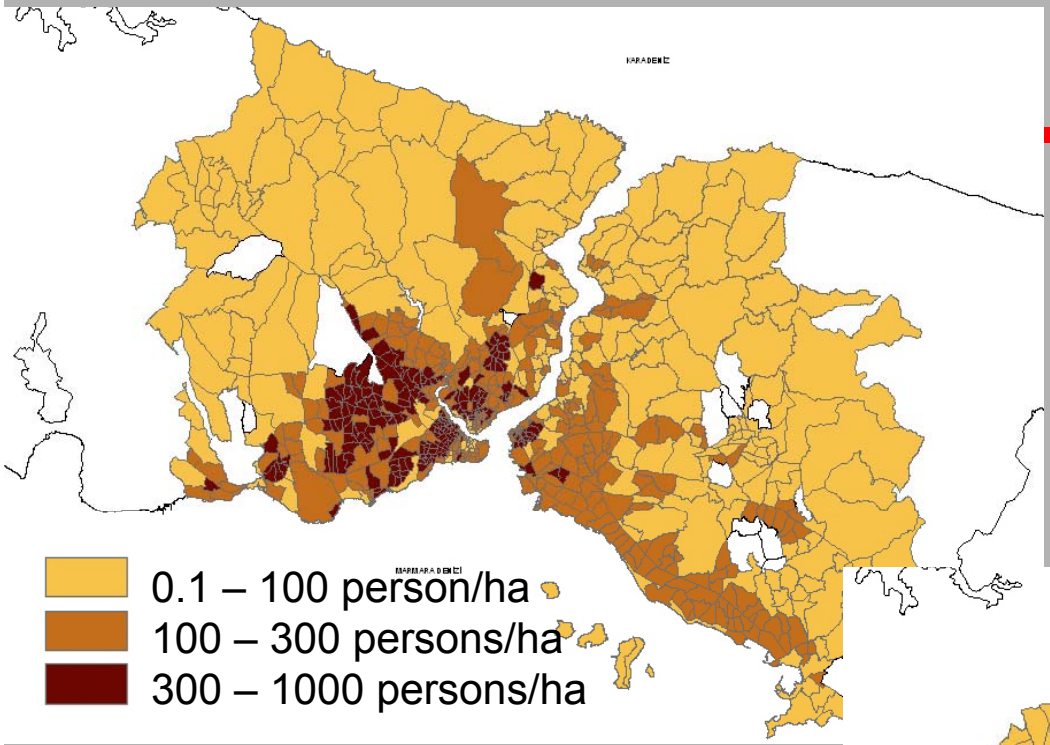
d. Identify respondents
   Random selection (Kish, 1949)

Grouping of mahalles (wards)

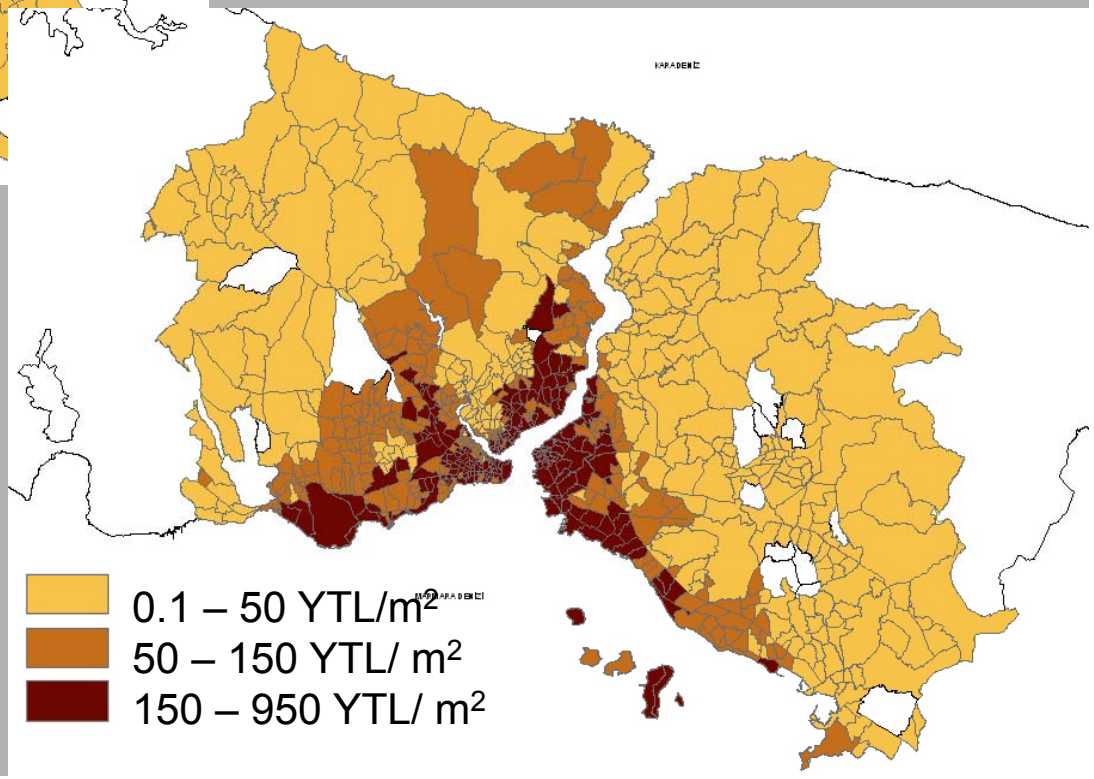
Net residential densities – 2000 Census data

	Low Density	Medium Density	High Density
Low Land Value			
Medium Land Value			
High Land Value Land value/meter square – 2002 Tax assessment data			

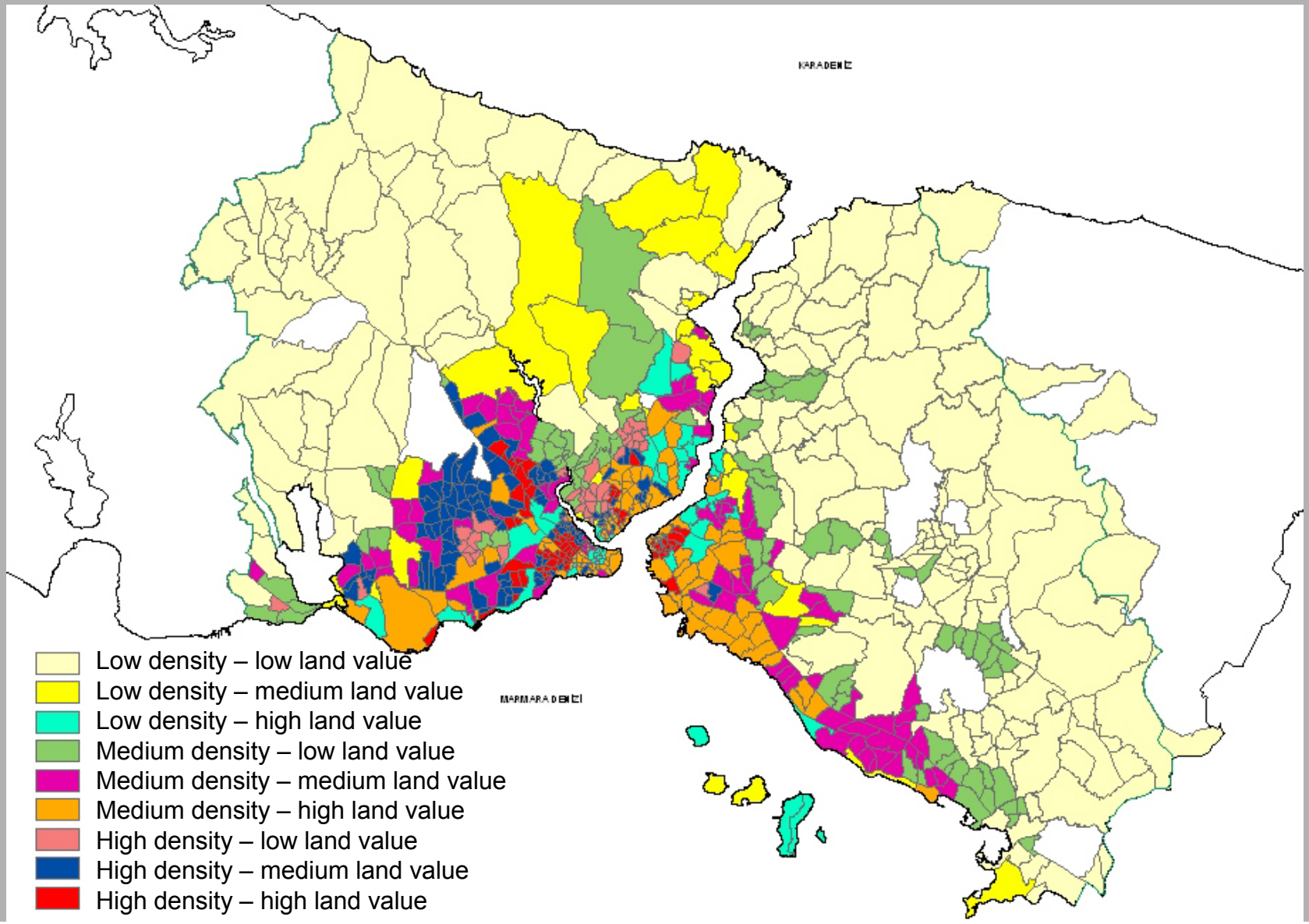
Residential Density of Mahalles



Average Land Values of Mahalles



Mahalle Groupings



Measurements

Walking Behavior

In the past week, have you walked to (each of the following):

a) **Visit a friend**
b) **Shop**
c) **A playground/park**
d) **Exercise around here**

Utilitarian Walking

a) **Visit a friend**
b) **Shop**

No utilitarian walking
One: Having walked to a friend or to shop in the past week
Two: Having done both, i.e., walked to visit a friend and to shop in the past week

Recreational Walking

c) **a playground/park**
d) **exercise around here**

No recreational walking
One: Having walked to a park/playground or to exercise in the past week
Two: Having done both, i.e., walked to a park/playground and to exercise in the past week

Measurements

Contextual-level Variables

Neighnorhood

Perceived neighborhood safety index (Cronbach's alpha .818)

- How much crime there is in your neighborhood?
- How safe it is considered to go outside during day in this neighborhood?
- How safe it is considered to go outside at night in this neighborhood?
- How safe it is for women to go outside at night in this neighborhood?
- How satisfied you are with the safety of this area?

Neighborhood social interaction index (Cronbach's alpha .728)

- Number of relatives living in the neighborhood
- Number of friends living in the neighborhood
- Number of individuals known by name in the street or nearby area
- Frequency of visiting those known in the neighborhood
- Frequency of doing favor with those known in the neighborhood, such as watching children, lending materials/tools, helping with shopping etc.

Measurements

Contextual-level Variables

Micro-environment

Rating attributes of the micro environment defined as
what one sees from one's front door
7-point semantic differentiation scale

View: Physical Disorder (Cronbach's alpha = .791)
unmaintained houses and unmaintained yards and roads

View: Social Disorder (Cronbach's alpha= .731)
no good neighbors, people not like me, and unfriendly people

View: Busy Place (Cronbach's alpha = .774)
nosy, crowded, no trees/green, and heavy traffic

Analysis

Multinomial Logistic Regression Models

Question: **which variables increase or decrease the odds that someone will engage in utilitarian or recreational walking?**

Dependent variables:

Utilitarian walking
(no, one and two)

Recreational walking
(no, one and two)

Independent variables:

Individual-Level variables
Contextual-Level variables
Control variables

Administered questionnaires: **1,635**

4. Results

Utilitarian walking

a) Walk to visit a friend: 64%

both 56%

b) Walk to shop: 78%

Recreational walking

c) Walk to a park/playground: 22%

both 10%

d) Walk to exercise: 21%

Utilitarian Walking

Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I	
	One	Two
Individual-Level Variables		
Age	.989	**.984** **
Female	**1.680** **	**1.488** **
Education	**1.189** *	**1.194** *
Being retired	1.357	**2.884** ***
Household income	**.905** *	**.909** *
Body Mass Index	1.015	1.033

One: Having walked to a friend or to shop in the past week
Two: Having done both, i.e., walked to visit a friend and to shop in the past week

Utilitarian Walking
Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II	
	One	Two	One	Two
Individual-Level Variables				
Age	.989	**.984** **	.988	**.982** **
Female	**1.680** **	**1.488** **	**1.630** **	**1.520** **
Education	**1.189** *	**1.194** *	1.162	**1.289** **
Being retired	1.357	**2.884** ***	1.298	**2.854** ***
Household income	**.905** *	**.909** *	**.878** **	**.855** ***
Body Mass Index	1.015	1.033	1.018	1.033
Contextual-Level Variables				
Neighborhood safety			1.138	**1.393** **
Neighborhood social networks			1.099	**1.688** **
View: Busy place			1.043	**1.131** *
View: Physical disorder			**.889** *	**.856** **
View: Social disorder			**1.166** *	1.012

One: Having walked to a friend or to shop in the past week
Two: Having done both, i.e., walked to visit a friend and to shop in the past week

Utilitarian Walking

Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II		Model U-III	
	One	Two	One	Two	One	Two
Individual-Level Variables						
Age	.989	.984 **	.988	**.982** **	**.985** *	**.979** **
Female	**1.680** **	**1.488** **	**1.630** **	**1.520** **	**1.776** ***	**1.722** ***
Education	**1.189** *	**1.194** *	1.162	**1.289** **	1.205	**1.326** **
Being retired	1.357	**2.884** ***	1.298	**2.854** ***	1.360	**2.924** ***
Household income	**.905** *	**.909** *	**.878** **	**.855** ***	.905	**.907** *
Body Mass Index	1.015	1.033	1.018	1.033	1.027	1.040
Contextual-Level Variables						
Neighborhood safety			1.138	**1.393** **	1.134	**1.346** **
Neighborhood social networks			1.099	**1.688** **	1.125	**1.744** ***
View: Busy place			1.043	**1.131** *	1.079	**1.188** **
View: Physical disorder			**.889** *	**.856** **	.906	**.881** *
View: Social disorder			**1.166** *	1.012	**1.147** *	1.013
Control Variables						
Density					1.010	**1.302** *
Land value					1.036	.899
Public transportation available					.608	.722
Number of cars in household					.768	.657
Satisfaction with parks/playground					**1.127** **	1.033
Satisfaction with living here					.936	1.002
Not a good place to walk					.927	**.796** **

One: Having walked to a friend or to shop in the past week
Two: Having done both, i.e., walked to visit a friend and to shop in the past week

Utilitarian Walking

Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II		Model U-III		Model U-III Reduced	
	One	Two	One	Two	One	Two	One	Two
Individual-Level Variables								
Age	.989	.984 **	.988	**.982** **	**.985** *	**.979** **	**.987** *	**.982** **
Female	**1.680** **	**1.488** **	**1.630** **	**1.520** **	**1.776** ***	**1.722** ***	**1.638** **	**1.521** **
Education	**1.189** *	**1.194** *	1.162	**1.289** **	1.205	**1.326** **	1.155	**1.219** *
Being retired	1.357	**2.884** ***	1.298	**2.854** ***	1.360	**2.924** ***	1.296	**2.763** ***
Household income	**.905** *	**.909** *	**.878** **	**.855** ***	.905	**.907** *	**.885** **	**.862** ***
Body Mass Index	1.015	1.033	1.018	1.033	1.027	1.040	---	---
Contextual-Level Variables								
Neighborhood safety			1.138	**1.393** **	1.134	**1.346** **	1.110	**1.349** **
Neighborhood social networks			1.099	**1.688** **	1.125	**1.744** ***	1.114	**1.743** ***
View: Busy place			1.043	**1.131** *	1.079	**1.188** **	1.066	**1.178** **
View: Physical disorder			**.889** *	**.856** **	.906	**.881** *	.918	**.890** *
View: Social disorder			**1.166** *	1.012	**1.147** *	1.013	---	---
Control Variables								
Density					1.010	**1.302** *	1.042	**1.356** **
Land value					1.036	.899	---	---
Public transportation available					.608	.722	---	---
Number of cars in household					.768	.657	---	---
Satisfaction with parks/playground					**1.127** **	1.033	**1.116** *	1.026
Satisfaction with living here					.936	1.002	---	**---**
Not a good place to walk					.927	**.796** **	.943	**.798** **

One: Having walked to a friend or to shop in the past week
Two: Having done both, i.e., walked to visit a friend and to shop in the past week

Recreational Walking
Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I			
	One		Two	
Individual-Level Variables				
Age	1.008		1.000	
Female	1.244		.771	
Education	**1.263**	***	**1.566**	***
Being retired	1.123		**.368**	***
Household income	**1.109**	**	1.006	
Body Mass Index	1.013		1.008	

One: Having walked to a park/playground or to exercise in the past week
Two: Having done both, i.e., walked to a park/playground and to exercise in the past week

Recreational Walking
Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II	
	One	Two	One	Two
Individual-Level Variables				
Age	1.008	1.000	1.006	.992
Female	1.244	.771	1.245	.747
Education	**1.263** ***	**1.566** ***	**1.267** ***	**1.446** ***
Being retired	1.123	**.368** ***	1.122	**.337** ***
Household income	**1.109** **	1.006	**1.080** *	.962
Body Mass Index	1.013	1.008	1.013	1.012
Contextual-Level Variables				
Neighborhood safety			**1.285** **	1.192
Neighborhood social networks			1.187	.929
View: Busy place			1.041	.987
View: Physical disorder			**.909** *	**.774** ***
View: Social disorder			1.010	1.067

One: Having walked to a park/playground or to exercise in the past week
Two: Having done both, i.e., walked to a park/playground and to exercise in the past week

Recreational Walking
Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II		Model U-III	
	One	Two	One	Two	One	Two
Individual-Level Variables						
Age	1.008	1.000	1.006	.992	1.002	.988
Female	1.244	.771	1.245	.747	1.219	.768
Education	**1.263** ***	**1.566** ***	**1.267** ***	**1.446** ***	**1.274** ***	**1.476** **
Being retired	1.123	**.368** ***	1.122	**.337** ***	1.127	**.321** ***
Household income	**1.109** **	1.006	**1.080** *	.962	**1.099** *	1.001
Body Mass Index	1.013	1.008	1.013	1.012	1.016	1.018
Contextual-Level Variables						
Neighborhood safety			**1.285** **	1.192	**1.201** *	1.138
Neighborhood social networks			1.187	.929	1.201	1.060
View: Busy place			1.041	.987	**1.114** *	1.055
View: Physical disorder			**.909** *	**.774** ***	.953	**.841** **
View: Social disorder			1.010	1.067	1.023	1.059
Control Variables						
Density					.890	1.322
Land value					.892	1.061
Public transportation available					.789	1.533
Number of cars in household					1.025	**.679** *
Satisfaction with parks/playground					**1.075** *	1.060
Satisfaction with living here					**1.104** *	.919
Not a good place to walk					.897	**.577** ***

One: Having walked to a park/playground or to exercise in the past week
Two: Having done both, i.e., walked to a park/playground and to exercise in the past week

Recreational Walking
Multinomial Logistic Regression Models

***, **, * denote significance at the .001. 01 and .05 level of confidence respectively

n=1,635	Model U-I		Model U-II		Model U-III		Model U-III Reduced	
	One	Two	One	Two	One	Two	One	Two
Individual-Level Variables								
Age	1.008	1.000	1.006	.992	1.002	.988	--	--
Female	1.244	.771	1.245	.747	1.219	.768	--	
Education	**1.263** ***	**1.566** ***	**1.267** ***	**1.446** ***	**1.274** ***	**1.476** **	**1.176** **	**1.525** ***
Being retired	1.123	**.368** ***	1.122	**.337** ***	1.127	**.321** ***	1.097	**.386** ***
Household income	**1.109** **	1.006	**1.080** *	.962	**1.099** *	1.001	**1.088** *	1.040
Body Mass Index	1.013	1.008	1.013	1.012	1.016	1.018	--	--
Contextual-Level Variables								
Neighborhood safety			**1.285** **	1.192	**1.201** *	1.138	**1.221** *	1.121
Neighborhood social networks			1.187	.929	1.201	1.060	--	--
View: Busy place			1.041	.987	**1.114** *	1.055	**1.089** *	1.118
View: Physical disorder			**.909** *	**.774** ***	.953	**.841** **	.953	**.833** **
View: Social disorder			1.010	1.067	1.023	1.059	--	--
Control Variables								
Density					.890	1.322	--	--
Land value					.892	1.061	--	--
Public transportation available					.789	1.533	--	--
Number of cars in household					1.025	**.679** *	1.040	**.671** *
Satisfaction with parks/playground					**1.075** *	1.060	--	--
Satisfaction with living here					**1.104** *	.919	**1.112** *	.923
Not a good place to walk					.897	**.577** ***	**.867** **	**.591** ***

One: Having walked to a park/playground or to exercise in the past week
Two: Having done both, i.e., walked to a park/playground and to exercise in the past week

Overall Results

Utilitarian Walking		Recreational Walking	
One	**Two**	**One**	**Two**
Individual-Level	**Individual-Level**	**Individual-Level**	**Individual-Level**
Age (-)	Age (-)	Age	Age
Female (+)	Female (+)	Female	Female
Education	Education (+)	Education (+)	Education (+)
Being retired	Being retired (+)	Being retired	Being retired (-)
Household income (-)	Household income (-)	Household income (+)	Household income
Body Mass Index	Body Mass Index	Body Mass Index	Body Mass Index
Contextual Variables	**Contextual Variables**	**Contextual Variables**	**Contextual Variables**
Neighborhood safety	Neighborhood safety (+)	Neighborhood safety (+)	Neighborhood safety
Neighborhood social networks	Neighborhood social networks (+)	Neighborhood social networks	Neighborhood social networks
View: Busy place	View: Busy place (+)	View: Busy place (+)	View: Busy place
View: Physical disorder	View: Physical disorder (-)	View: Physical disorder	View: Physical disorder (-)
View: Social disorder	View: Social disorder	View: Social disorder	View: Social disorder
Control Variables	**Control Variables**	**Control Variables**	**Control Variables**
Density	Density (+)	Density	Density
Land value	Land value	Land value	Land value
Public transportation available	Public transportation available	Public transportation available	Public transportation available
Number of cars in household	Number of cars in household	Number of cars in household	Number of cars in household (-)
Satisfaction with parks/playgr. (+)	Satisfaction with parks/playgrounds	Satisfaction with parks/playgrounds	Satisfaction with parks/playgrounds
Satisfaction with living here	Satisfaction with living here	Satisfaction with living here (+)	Satisfaction with living here
Not a good place to walk	Not a good place to walk (-)	Not a good place to walk (-)	Not a good place to walk (-)

Statistically significant positive relationship

Statistically significant negative relationship

Summary Results

Utilitarian walking

Increase odds:

- Female
- Education
- Being retired
- Neighborhood safety
- Neighborhood social networks
- View: Busy place
- Residential density
- Satisfaction with parks/playgrounds

Decrease odds:

- Age
- Household income
- View: Physical disorder
- Not a good place to walk

Recreational walking

Increase odds:

- Education
- Household income
- Neighborhood safety
- View: Busy place
- Satisfaction with living here

Decrease odds:

- Being retired
- View: Physical disorder
- Number of cars in household
- Not a good place to walk

Thank you!

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