

How can paths be risky

Douglas Wiebe, PhD

Director, Penn Injury Science Center

Professor

Department of Biostatistics, Epidemiology & Informatics

Perelman School of Medicine

University of Pennsylvania

18 March 2021

INJURY PREVENTION/ORIGINAL RESEARCH

Homicide and Suicide Risks Associated With Firearms in the Home: A National Case-Control Study

Douglas J. Wiebe, PhD

From the Violence Prevention Research Group, University of California—Los Angeles School of Public Health, Los Angeles, CA.

Study objective: I test the hypothesis that having a gun in the home is a risk factor for adults to be killed (homicide) or to commit suicide.

Methods: Two case-control analyses were based on national samples of subjects 18 years of age or older. Homicide and suicide case subjects were drawn from the 1993 National Mortality Followback Survey. Living control subjects were drawn from the 1994 National Health Interview Survey. Ten control subjects matched by sex, race, and age group were sought for each case subject.

Results: The homicide sample consisted of 1,720 case subjects and 8,084 control subjects. Compared with adults in homes with no guns, the adjusted odds ratio (OR) for homicide was 1.41 (95% confidence interval [CI] 1.20 to 1.65) for adults with a gun at home and was particularly high among women (adjusted OR 2.72; 95% CI 1.89 to 3.90) compared with men (adjusted OR 1.23; 95% CI 1.01 to 1.49) and among nonwhite subjects (adjusted OR 1.74; 95% CI 1.37 to 2.21) compared with white subjects (adjusted OR 1.27; 95% CI 1.03 to 1.56). Further analyses revealed that a gun in the home was a risk factor for homicide by firearm means (adjusted OR 1.72; 95% CI 1.40 to 2.12) but not by nonfirearm means (OR 0.83; 95% CI 0.62 to 1.11). The suicide sample consisted of 1,959 case subjects and 13,535 control subjects. The adjusted OR for suicide was 3.44 (95% CI 3.06 to 3.86) for persons with a gun at home. However, further analysis revealed that having a firearm in the home was a risk factor for suicide by firearm (adjusted OR 16.89; 95% CI 13.26 to 21.52) but was inversely associated with suicide by other means (adjusted OR 0.68; 95% CI 0.55 to 0.84).

Conclusion: Having a gun at home is a risk factor for adults to be shot fatally (gun homicide) or commit suicide with a firearm. Physicians should continue to discuss with patients the implications of keeping guns at home. Additional studies are warranted to address study limitations and to better understand the implications of firearm ownership.

[*Ann Emerg Med.* 2003;41:771-782.]



F6 N THE NEW YORK TIMES, TUESDAY, MAY 27, 2003

CAUSE AND EFFECT

Linking Guns and Gun Violence

People with guns in their homes are almost twice as likely to be killed by guns as people who do not keep them at home, researchers reported yesterday in *The Annals of Emergency Medicine*.

And, the researchers found, people with guns are 16 times as likely to commit suicide using guns.

The explanation may lie in the unforgiving nature of firearms, said the author of the study, Dr.

Douglas J. Wiebe, who conducted the research at the University of California at Los Angeles and is now at the University of Pennsylvania.

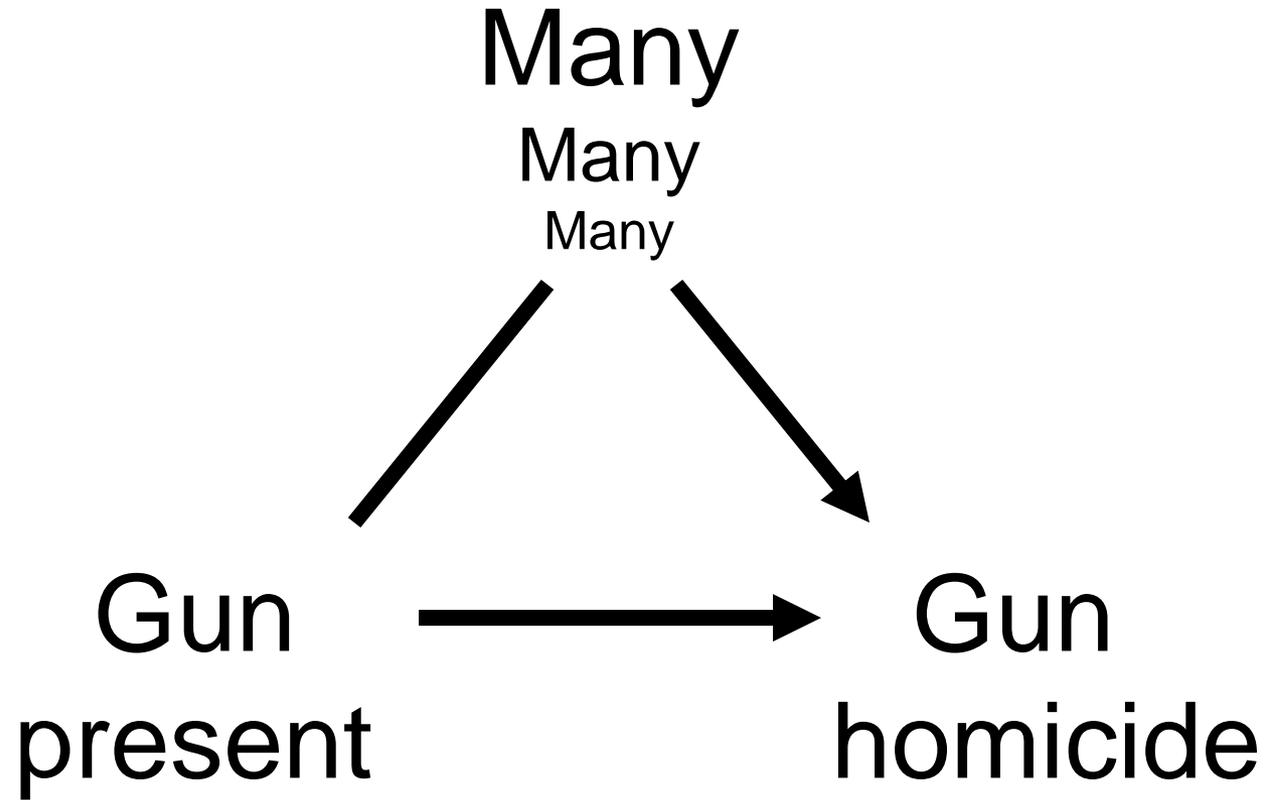
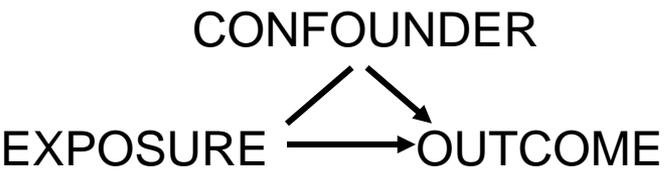
"People who are shot are substantially more likely to die than people injured with nongun weapons," Dr. Wiebe said.

The study was based on a review of the deaths of 1,720 homicide victims and 1,959 suicide victims and a sampling of American adults.

It found that most of the victims, over 56 percent, knew their assailants. A fifth of the homicides occurred during robberies, 6 percent during drug deals and about 15 percent during family arguments.

The study also found that women were significantly more likely than men to be victims of gun homicides. "This likely reflects the singular danger faced by women in abusive relationships," Dr. Wiebe wrote.



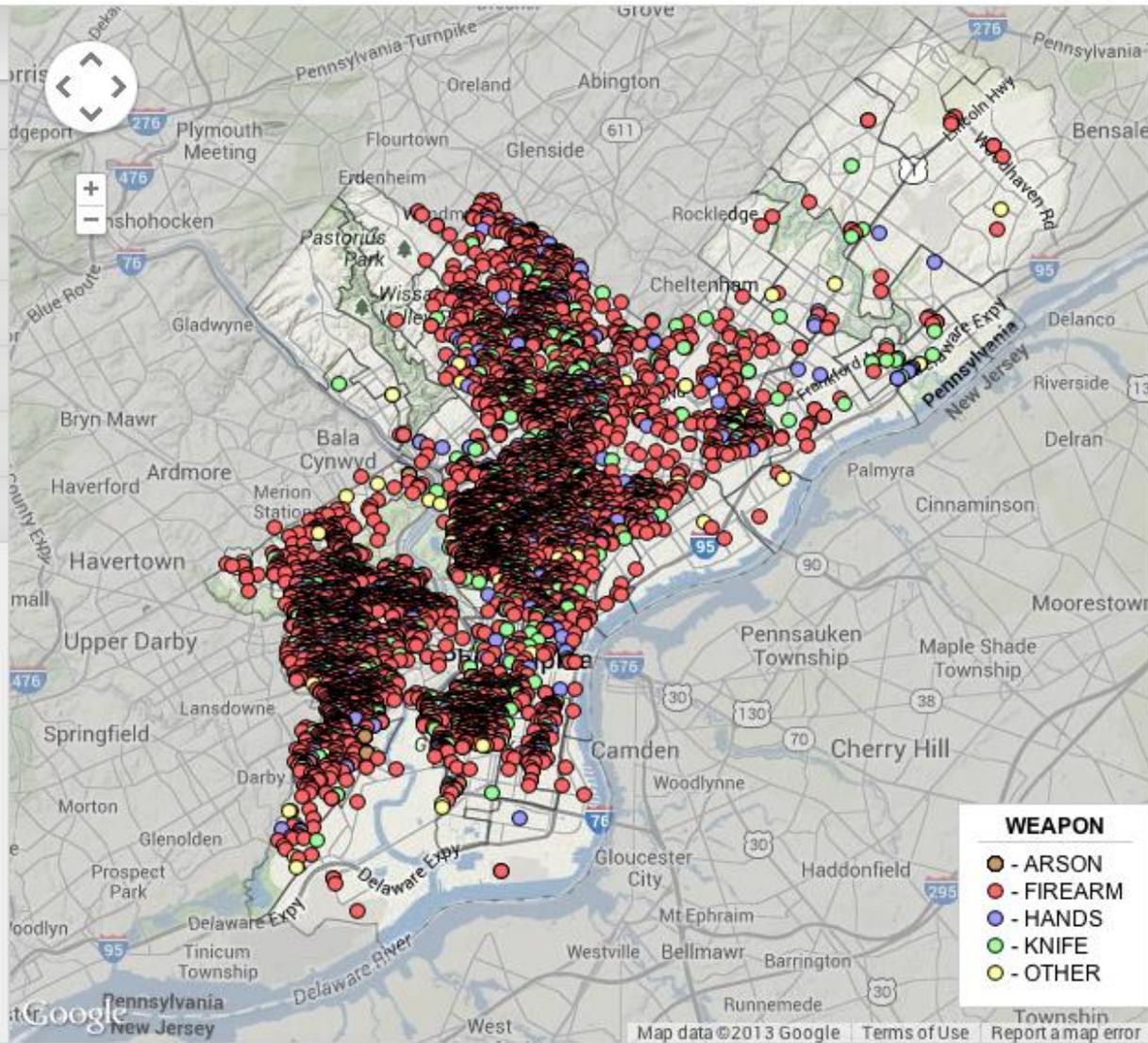
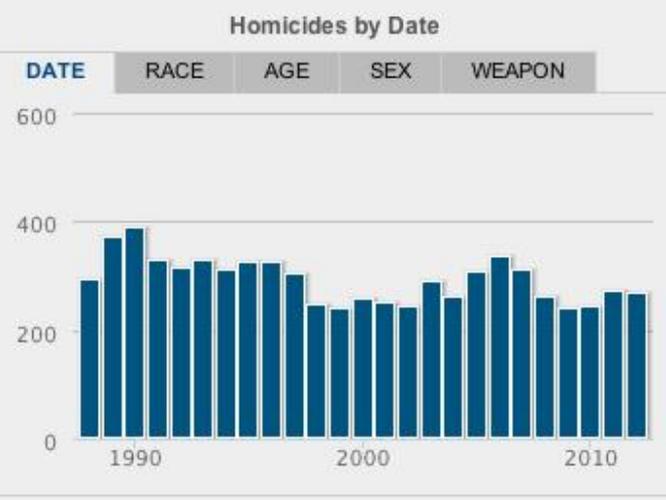


Homicides in Philadelphia

Since 1988, over 9,000 people have been slain on the streets of Philadelphia, affecting every neighborhood in the city. To put that deadly toll in perspective, during the length of U.S. combat operations in the Iraq war, 3,517 American troops were killed in action - and 3,113 people were killed in Philadelphia. Explore the data below with the maps and charts or view the entire list of homicide victims

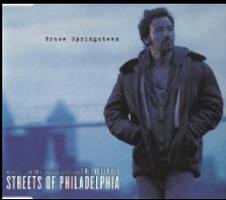
Homicides: 7,303

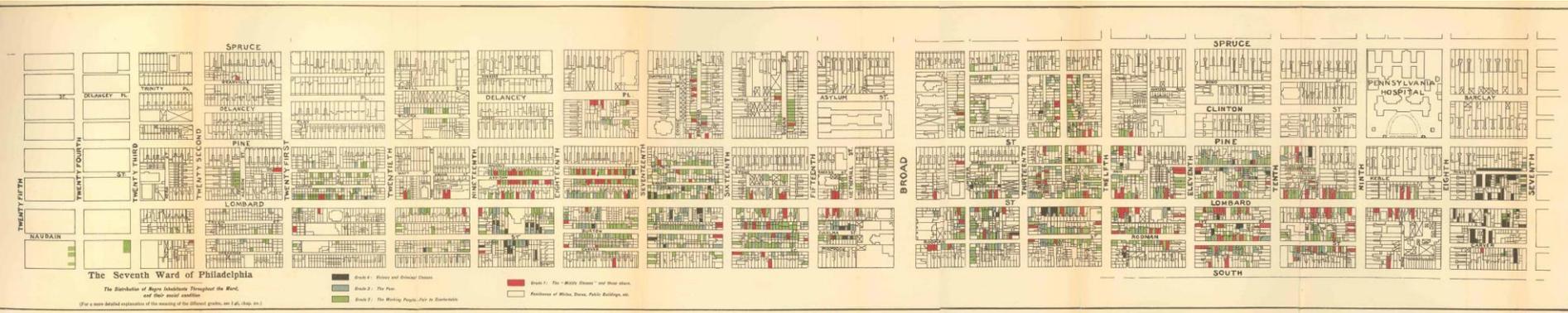
DATE: TO
 RACE:
 AGE:
 SEX:
 WEAPON:
 NAME:



Source: Philadelphia Police Department
 Produced by: Rob Kandel, John Duchneskie / Staff

Streets of Philadelphia





W.E.B. DuBois

The Philadelphia Negro

A Social Study

With a new Introduction by **ELIJAH ANDERSON**

Space-Time Adolescent Risk Study



Perelman School of Medicine

School of Nursing

School of Arts and Sciences

School of Social Policy and Practice

School of Engineering & Applied Science

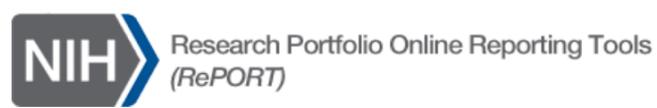
Children's Hospital of Philadelphia

**Charles Branas PhD, Wensheng Guo PhD, Therese Richmond PhD RN,
Paul Allison PhD, Elijah Anderson PhD*, Judd Hollander MD,
Michael Nance MD, C. William Schwab MD, C. Dana Tomlin PhD,
Douglas Wiebe PhD**

University of Pennsylvania

*Yale University

National Institute on Alcohol Abuse and Alcoholism,
National Institute of Child Health & Human Development (R01AA014944)



Search

Project Information

1R01AA014944-01A2

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PREVIOUS Project 4 of 18 NEXT

Project Number: 1R01AA014944-01A2	Contact PI / Project Leader: WIEBE, DOUGLAS J
Title: ALCOHOL FIREARMS AND ADOLESCENT GUNSHOT INJURY RISK	Awardee Organization: UNIVERSITY OF PENNSYLVANIA

Abstract Text:

DESCRIPTION (provided by applicant): Gunshot injury is the leading cause of death in 10-19 year old African American males and the second leading cause of adolescent death overall. Most adolescents who are killed with guns are shot during assaults (60 percent) and for each gunshot assault that is fatal, 7 adolescents require emergency department (ED) treatment for non-fatal assaultive gunshot trauma. Additionally, each day more than 70 adolescents require ED treatment for non-fatal assaultive injuries inflicted with non-gun weapons. Nevertheless, little is known about the epidemiology of assaultive injury from guns and other weapons among adolescents. By using an epidemiological space-time modeling approach, we have developed and pilot-tested an innovative, portable technology for dynamically mapping the activities of adolescents thereby allowing very accurate estimation of their exposure to alcohol and firearms on a minute-to-minute basis. To determine gunshot injury risk, we propose conducting a population-based case-control study. Adolescents 10-19 years of age presenting to the ED of 2 inner-city Philadelphia hospitals for assault-related gunshot injuries will be compared with a randomly selected, population-based sample of control subjects 10-19 years old. As a secondary aim, adolescents presenting for non-gunshot assault injuries will be enrolled as a second case group and compared with the same sample of control subjects to determine non-gun injury risk. Each case and control subject will be interviewed using portable, computerized mapping technology to create a dynamic graphic that provides a minute-by-minute record of how, when, with whom, and where the subject spent time as he or she walked or otherwise traveled from location to location and from activity to activity on the day of the injury (cases) or 1-4 days earlier designated randomly (controls). Each subject will be asked about his or her use of alcohol and firearms that day, and about how other people around him or her used alcohol and firearms that day (e.g., people drinking alcohol on street corners; firearms kept at home). Secondary data we will link, along with the narrative data, to the map will identify additional exposure and confounding factors including characteristics of streets, buildings, and neighborhoods. Logistic regression analyses will investigate whether adolescents who consume alcohol and/or carry firearms, and/or whose daily activities occur in surroundings rich in alcohol and/or firearms, face a differential risk of being shot with a firearm or injured in a non-gun assault. This study will help to identify how adolescents are restricted in time and space by their daily activities, thereby identifying particular locations and times of enhanced, and reduced, assaultive injury risk.

Project Terms:

adolescence (12-20); African American; alcoholic beverage consumption; alcoholism /alcohol abuse; behavioral /social science research tag; clinical research; emergency health services; epidemiology; human subject; injury; middle childhood (6-11); socioenvironment; violence; violence prevention



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Table 1 Major NIH research awards and cumulative morbidity for select conditions in the US, 1973–2002

Condition	Total cases	NIH research awards
Cholera	373	101
Diphtheria	1337	54
Polio	266	106
Rabies	55	59
Total of four diseases	2031	320
Firearm injuries	>3,000,000	3

Population-based case-control study

Recruitment: cases

Case subjects: HUP and CHOP

- Screening by Academic Associates
- Interviewing by full-time project staff
- Interview takes place in ER, on hospital ward, home, or research office



STARS: Space Time Adolescent Risk Study Screening

***** Please remember to check for patients who came in between 12am and 7am!!! *****
COMPLETE ENTIRE FORM EVEN IF ASSAULT PATIENT DOES NOT MEET ELIGIBILITY CRITERIA

Place Patient Sticker Here:

- CHOP
 HUP

ED triage date

ED triage time (click on Arrival):

Academic Associate Name:

PLEASE COMPLETE ENTIRE FORM FOR ASSAULT PATIENTS AGES 10-24

Look at Emtrac or Wellsoft.....

Keywords: GSW, Assault, Lac, Fall, Trauma, Injury, Broken, Pain, Fracture

1. Is the patient between 10 years 0 months through 24 years 11 months old? YES NO

2. Does the patient currently reside in one of these Philadelphia zip codes? Please circle one. YES NO
 Unsure
(If no enter zip code in space below)

19131, 19151, 19104, 19139, 19143, 19142, 19153, 19146, 19145
 19121, 19147, 19148

3. Is the patient the victim of an assault that occurred within the past 48 hours? YES NO
(if yes, specify below)

- firearm non firearm (see below) Unsure

4. Have you completed the assault details tool? YES NO

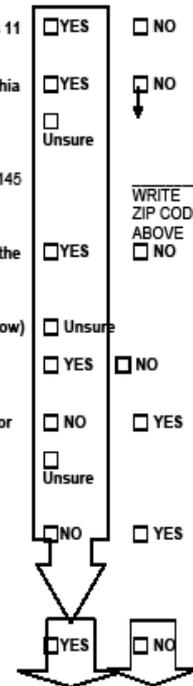
If not on Emtrac or Wellsoft, ask the resident.

5. Was the assault inflicted by someone the patient lives with or an intimate partner? NO YES
 Unsure

6. Is the injury due to suspected self harm? NO YES

(non-accidental, suicide attempt, or an intentional violent act upon self)

7. Is this patient being admitted? YES NO



If firearm victim meets criteria, please call the Stars Interviewer at 215-573-1877. Non-Firearm victims should be randomized for eligibility before contacting Interviewer.
To do this:

- Go here: <http://www.med.upenn.edu/stars/>
- Click on Academic Associates for directions.
- Username and password is "agone"
- Follow directions on website.

Then, write the random number on the back of this page.

Time Contacted Interviewer: _____ : _____ am pm N/A (circle one)

Put completed form in box.

Any questions, please call Interviewer at 215-573-1877

Recruitment: controls

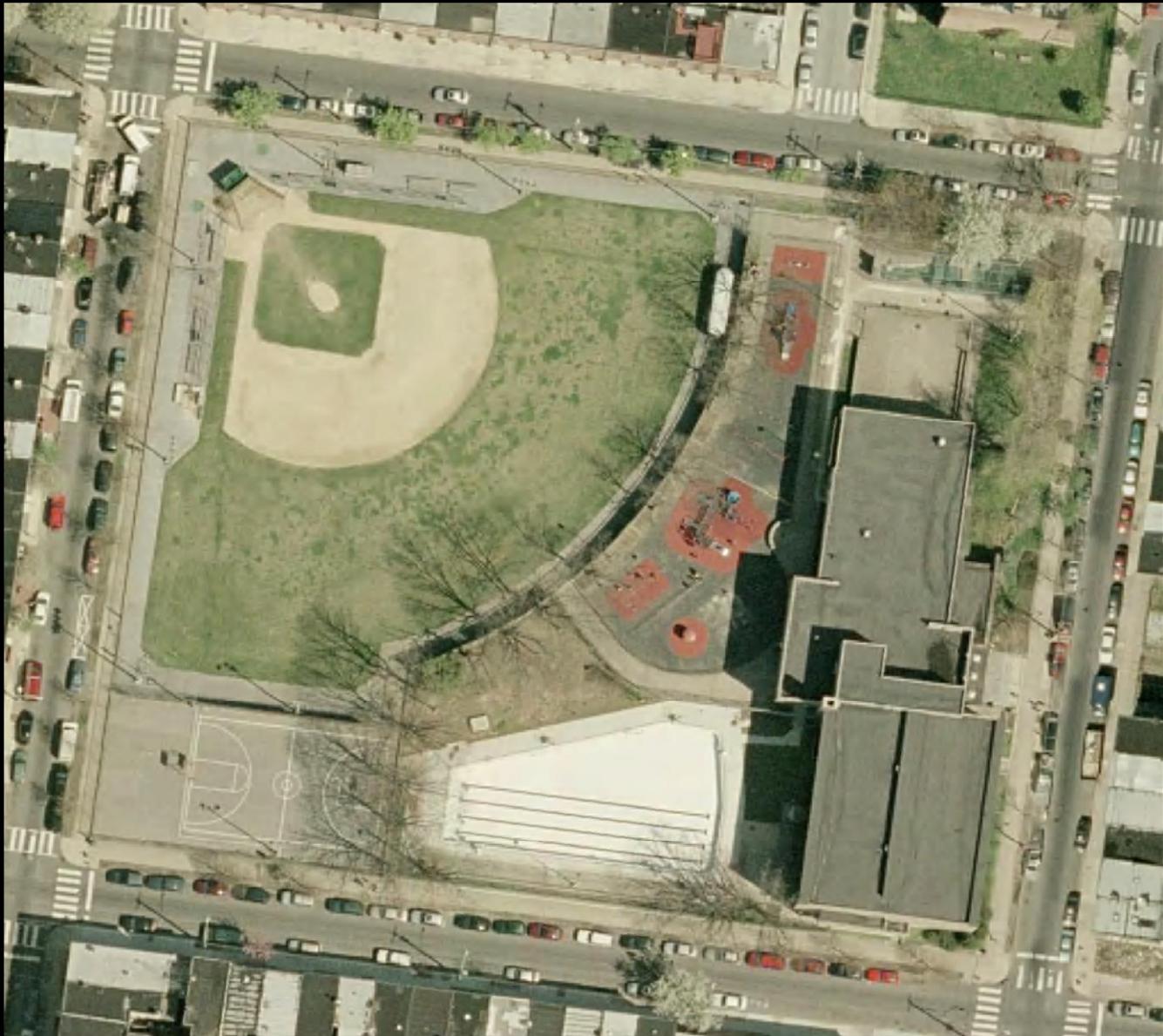
Control subjects: community

- Screening via RDD (random digit dialing)
- Interviewing by full-time project staff
- Interview takes place at home or research office
- Remuneration for participating

Interview

- Icebreaker map-reading exercise
- Baseline interview
- Activity-path interview

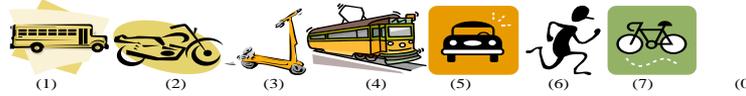






Time
6:00 am
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GO TO NEXT PAGE

How are you getting around? Here are some examples. Others?



What are you doing? Anything else?



How safe do you feel?

On a scale of 1-10, how safe do you feel?

10 FEELING VERY SAFE
1 FEELING VERY UNSAFE



- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1



Are any of these things involved? Anything else?



Who are you with? Family, Friends, Girlfriend, Boyfriend, Someone you don't like, anyone else?



Interview ID: grant1

Creation Time: 11/6/2008 1:21:09 PM

Last Update: 11/6/2008 2:22:24 PM

Interviewer: Luke

Closed?:

Remarks:

Delete Interview Add New Interview

8 of 9 Interviews

<< < > >>

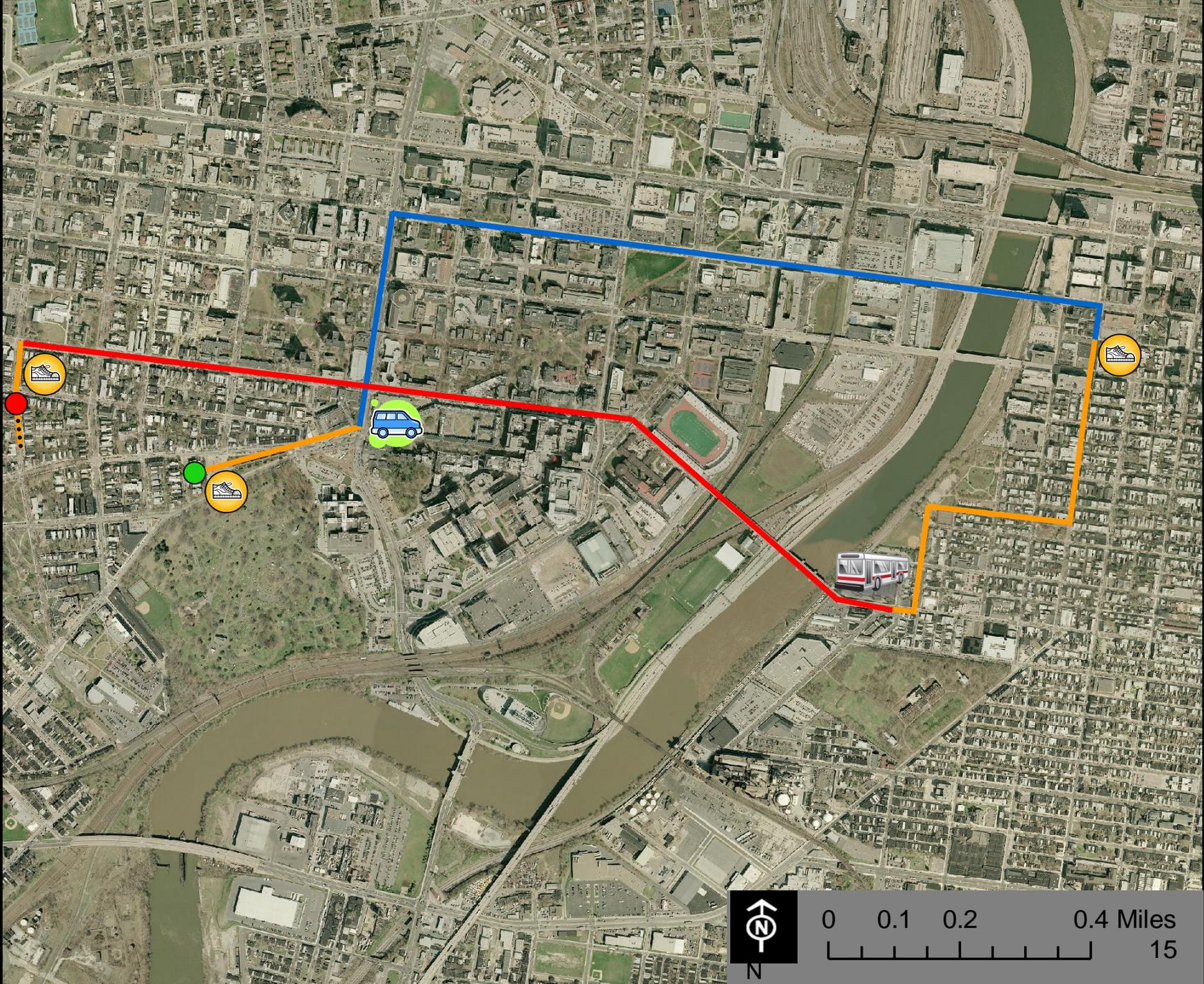
Search for Address: 3400 SPRUCE ST

Find Address



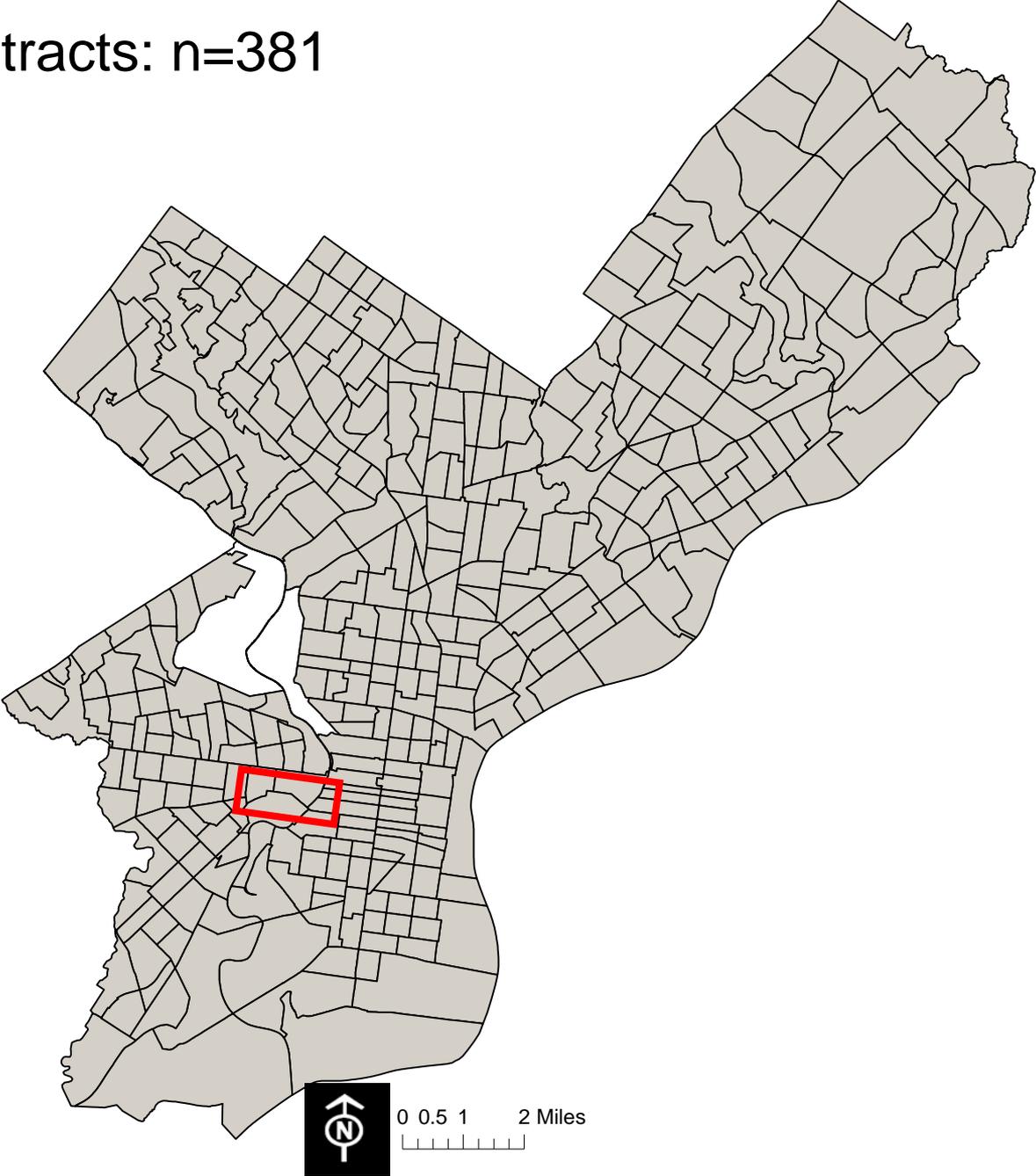
View: Detail Street Aerial

PathSeqID	DateAndTime	TransMode	Remarks	Activity	Safety	Weapon	Substance	Companion	IsIndoors	IsPointOfInjury
1	10/24/2008 07:00:00 AM	None	at home	waking up	10	none	cigarettes	mom, sister, cousin	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	10/24/2008 07:15:00 AM	None	at home	eating breakfast, getting ready for school	10	none	cigarettes	mom, sister	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	10/24/2008 07:30:00 AM	On Foot	leaving for school	walking	7	none	none	None	<input type="checkbox"/>	<input type="checkbox"/>
4	10/24/2008 07:31:00 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
5	10/24/2008 07:32:00 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
6	10/24/2008 07:32:30 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
7	10/24/2008 07:33:00 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
8	10/24/2008 07:34:00 AM	On Foot	walking to bus	walking	6	none	Alcohol	some guys	<input type="checkbox"/>	<input type="checkbox"/>
9	10/24/2008 07:35:00 AM	On Foot	walking to bus	walking	5	none	Alcohol, marijuana	guys on corner	<input type="checkbox"/>	<input type="checkbox"/>
10	10/24/2008 07:35:30 AM	On Foot	walking to bus	walking	5	none	alcohol, marijuana	guys on corner	<input type="checkbox"/>	<input type="checkbox"/>
11	10/24/2008 07:36:00 AM	On Foot	walking to bus	walking	6	none	marijuana	guys	<input type="checkbox"/>	<input type="checkbox"/>
12	10/24/2008 07:38:00 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
13	10/24/2008 07:39:30 AM	On Foot	walking to bus	walking	7	none	none	none	<input type="checkbox"/>	<input type="checkbox"/>
14	10/24/2008 07:40:13 AM	None	waiting for bus	standing	7	none	none	couple people	<input type="checkbox"/>	<input type="checkbox"/>
15	10/24/2008 07:50:00 AM	SEPTA Bus	on bus	Sitting	9	none	none	passengers	<input type="checkbox"/>	<input type="checkbox"/>

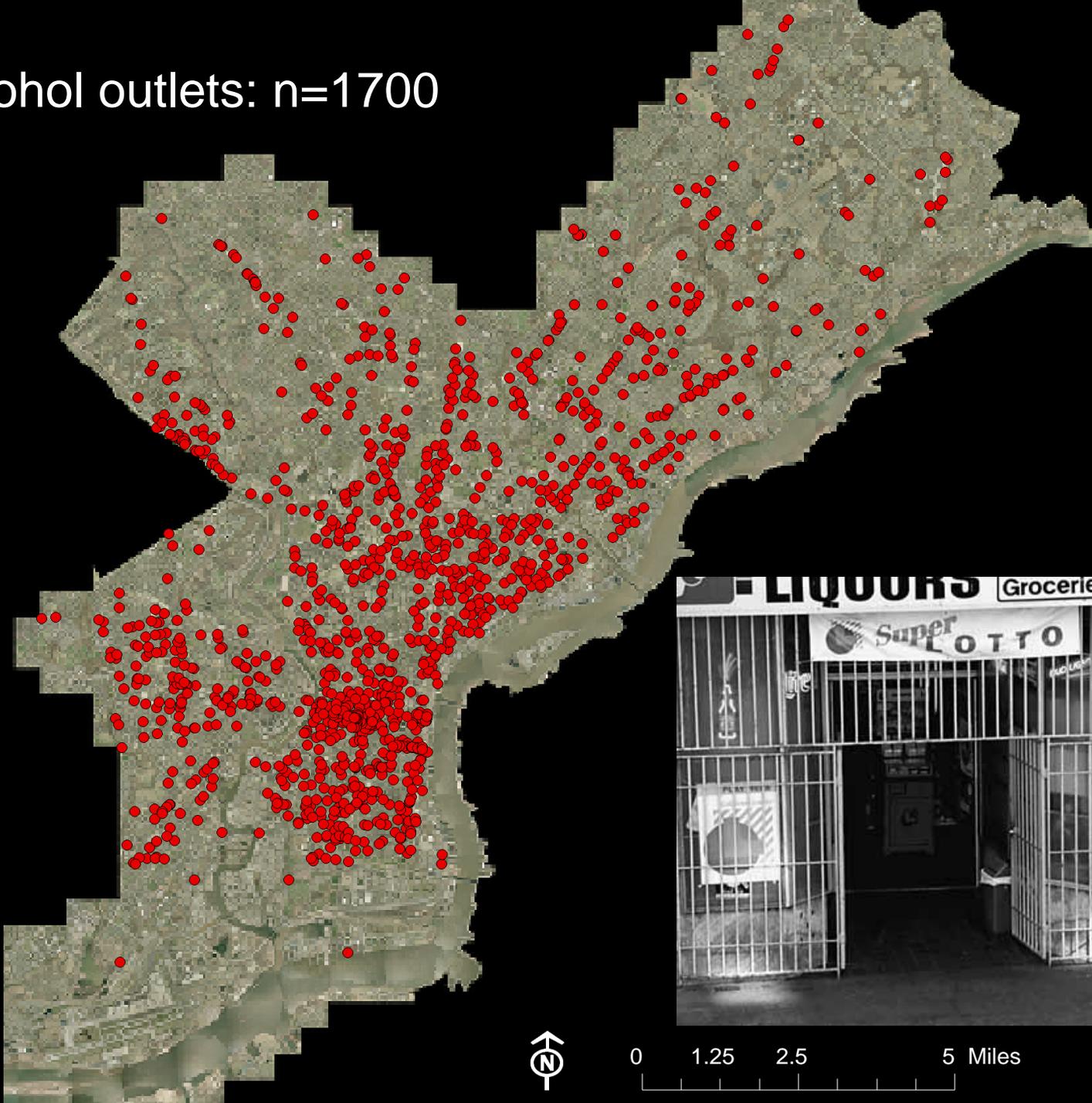


0 0.1 0.2 0.4 Miles
15

Census tracts: n=381



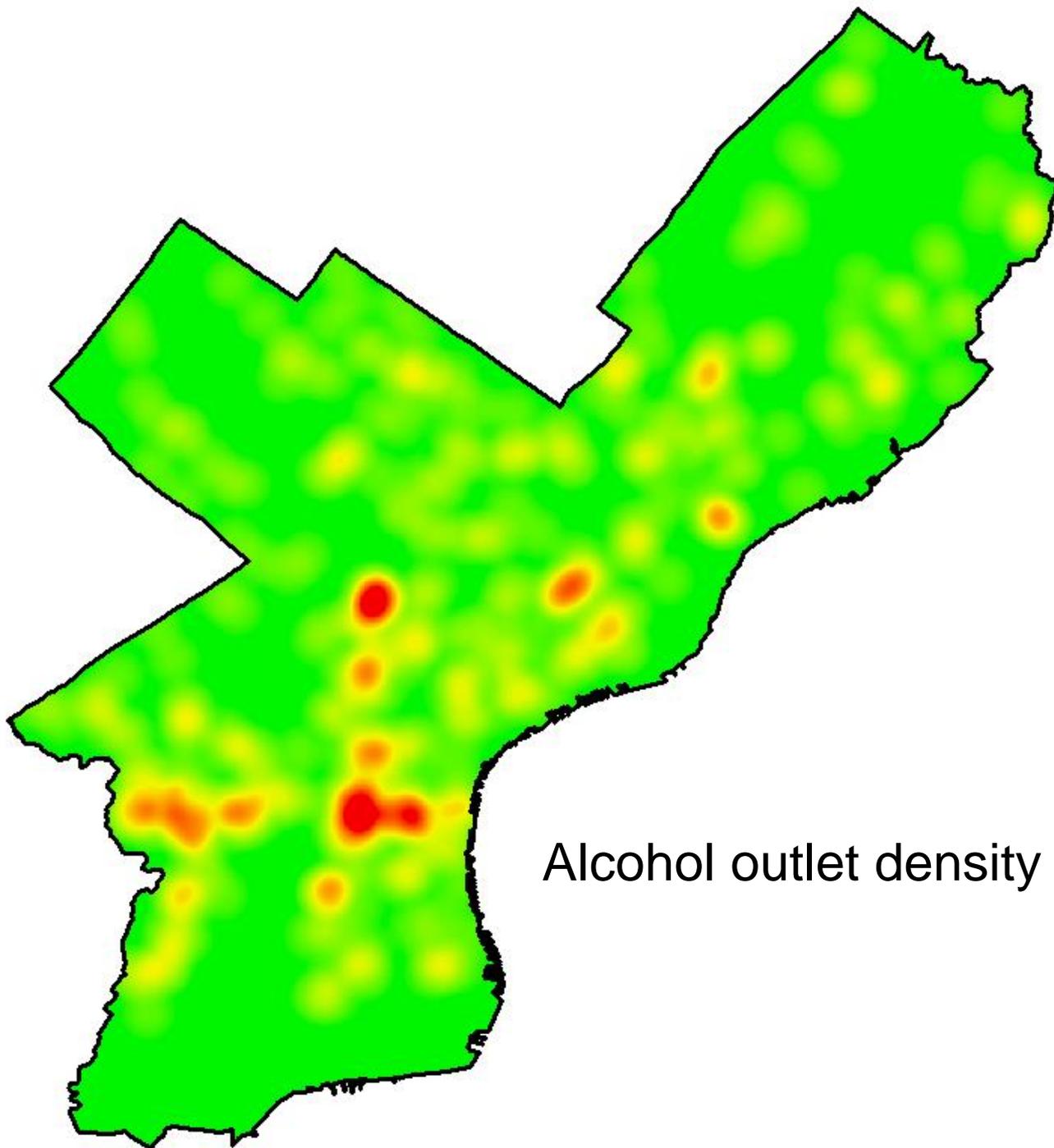
Alcohol outlets: n=1700



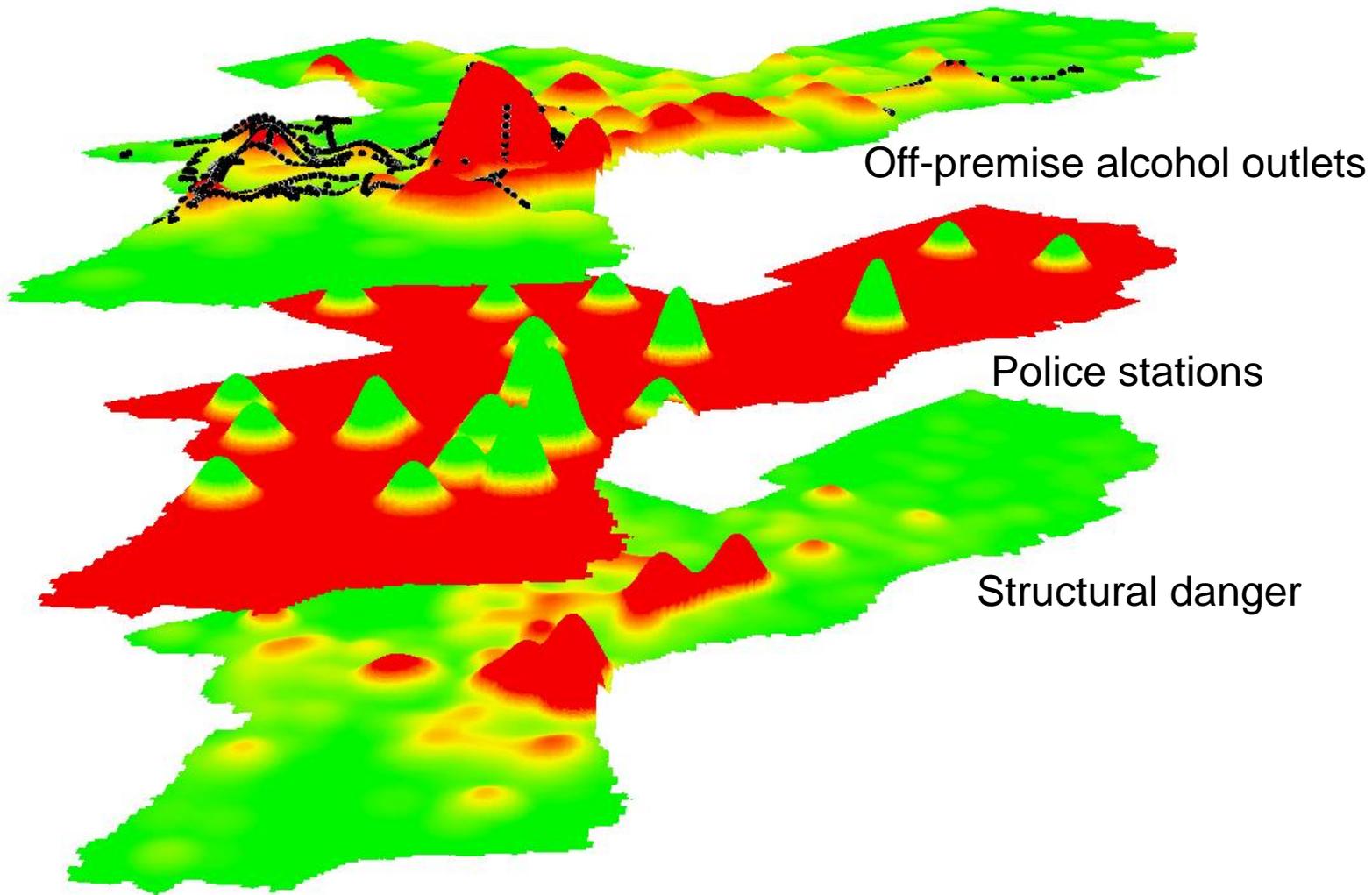
Brett Reinson



0 1.25 2.5 5 Miles



Alcohol outlet density



Mapping Activity Patterns to Quantify Risk of Violent Assault in Urban Environments

Douglas J. Wiebe,^a Therese S. Richmond,^b Wensheng Guo,^a Paul D. Allison,^c Judd E. Hollander,^d Michael L. Nance,^{e,f} and Charles C. Branas^a

Background: We collected detailed activity paths of urban youth to investigate the dynamic interplay between their lived experiences, time spent in different environments, and risk of violent assault.

Methods: We mapped activity paths of 10- to 24-year olds, including 143 assault patients shot with a firearm, 206 assault patients injured with other types of weapons, and 283 community controls, creating a step-by-step mapped record of how, when, where, and with whom they spent time over a full day from waking up until going to bed or being assaulted. Case-control analyses compared cases with time-matched controls to identify risk factors for assault. Case-crossover analyses compared cases at the time of assault with themselves earlier in the day to investigate whether exposure increases acted to the trigger assault.

Results: Gunshot assault risks included being alone (odds ratio [OR] = 1.6, 95% confidence interval [CI] = 1.3, 1.9) and were lower in areas with high neighbor connectedness (OR = 0.7, 95% CI = 0.6, 0.8). Acquiring a gun (OR = 1.4, 95% CI = 1.1, 1.6) and entering areas with more vacancy, violence, and vandalism (OR=1.7, 95%CI=1.1–2.7) appeared to trigger the risk of getting shot shortly thereafter. Nongunshot assault risks included being in areas with recreation centers (OR = 1.2, 95% CI = 1.1, 1.4). Entering an area with higher truancy (OR = 1.6, 95% CI = 1.1, 2.5) and more vacancy, violence, and vandalism appeared to trigger the risk of nongunshot assault. Risks varied by age group.

Individual characteristics

TABLE 1. Characteristics of 10- to 24-Year-old Subjects

Characteristic	Gunshot Wound Assault Cases (n = 123)	Nongunshot Wound Assault Cases (n = 175)	Controls (n = 274)
Individual			
Age, median	19	15	18
Male (%)	100	100	100
Race (%)			
African American	97	87	99
Caucasian	1	8	3
Other	2	5	0
Grades received in school (%)			
As and Bs	17	32	27
Bs and Cs	55	45	49
Cs and Ds	22	18	17
Ds, Es, and Fs	7	6	7
Wear seatbelt most of time or always (%)	27	46	43
Ever choose path based on safety (%)	71	75	74
Frequency to change direction because route seems unsafe (%)			
Daily	25	25	18
Weekly	20	23	19
Monthly	22	20	27
Never	33	32	36

Individual characteristics

TABLE 1. Characteristics of 10- to 24-Year-old Subjects

Characteristic	Gunshot Wound Assault Cases (n = 123)	Nongunshot Wound Assault Cases (n = 175)	Controls (n = 274)
Ever been jumped (%)	55	74 	56
Ever in fistfight (%)	94	95	92
Know someone in jail or prison (%)	85	82	88
Ever been in jail or prison (%)	54 	39	30
Ever been on juvenile probation (%)	56 	21	18
Ever been shot (%)	17 	3	4
Ever carried a weapon (%)	46 	28	39
Ever carried a gun (%)	32 	11	17
Could get a gun (%)	56	37 	57
Drank alcohol in past 30 days (%)	38 	24	34
Smoked marijuana in past 30 days (%)	50	45	42
Ever sold drugs (%)	27 	17	16

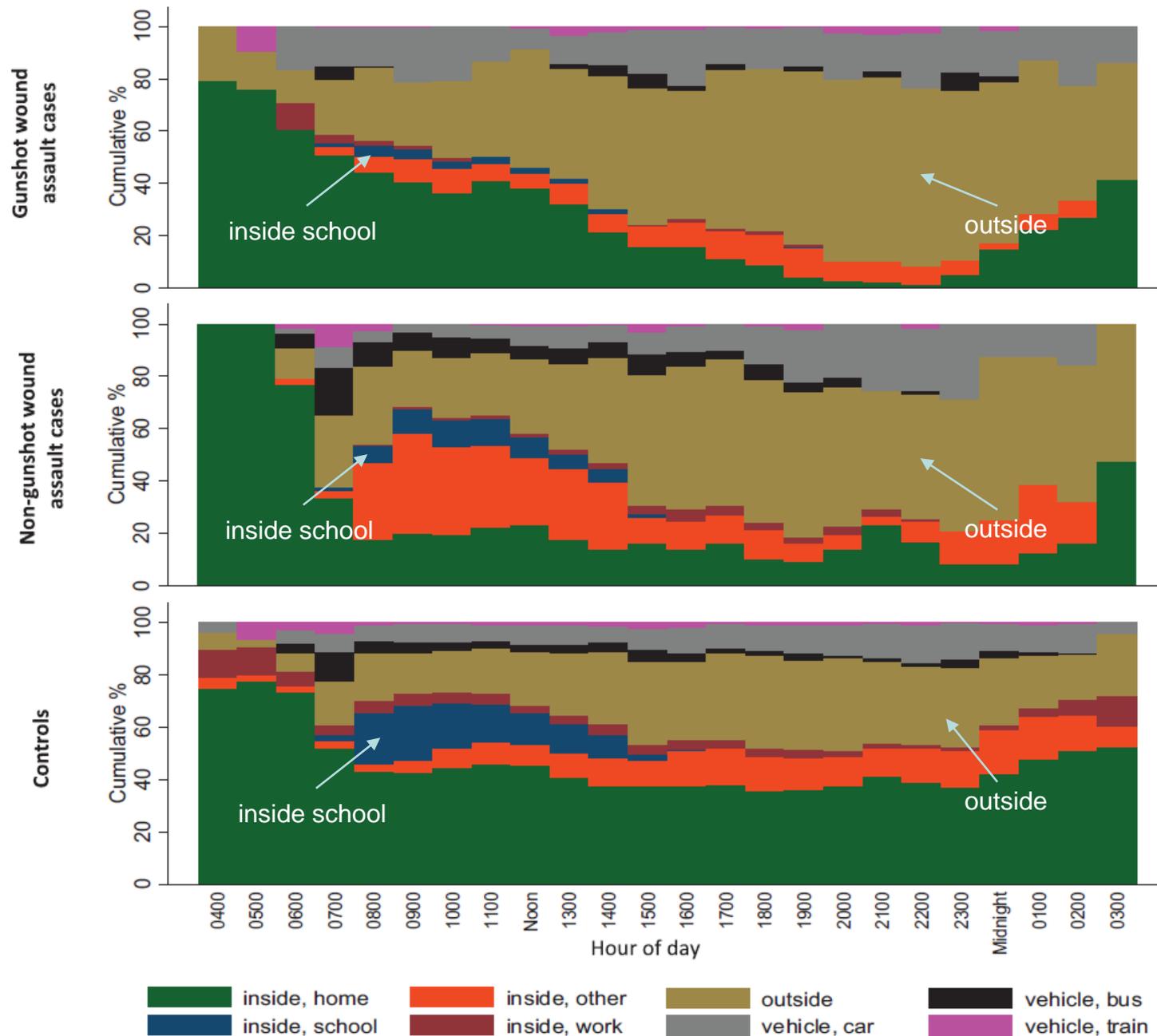


FIGURE 1. Percent of time during each hour of the day that subjects (all ages) spent in different types of locations and modes of transportation, by subject group.

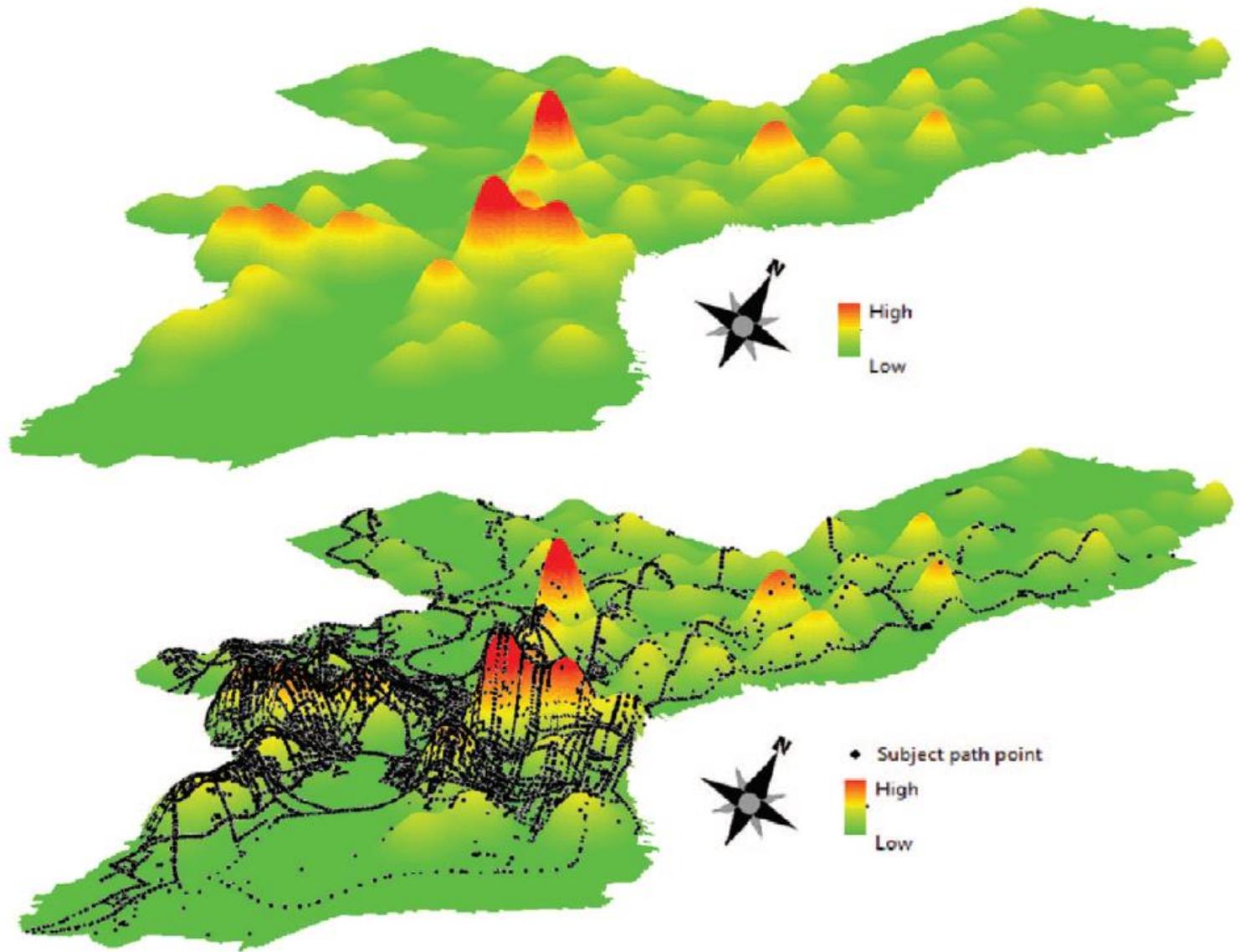
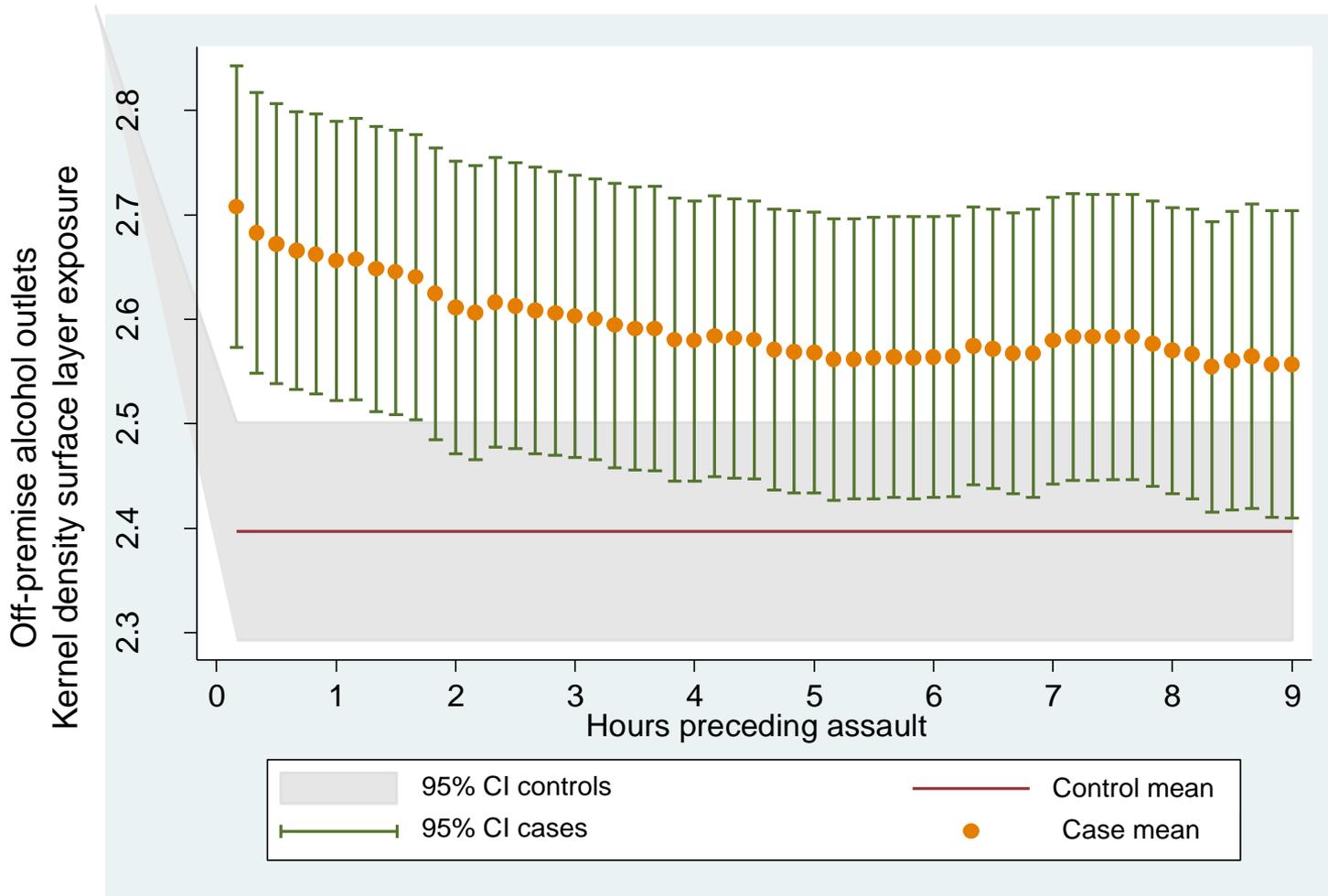
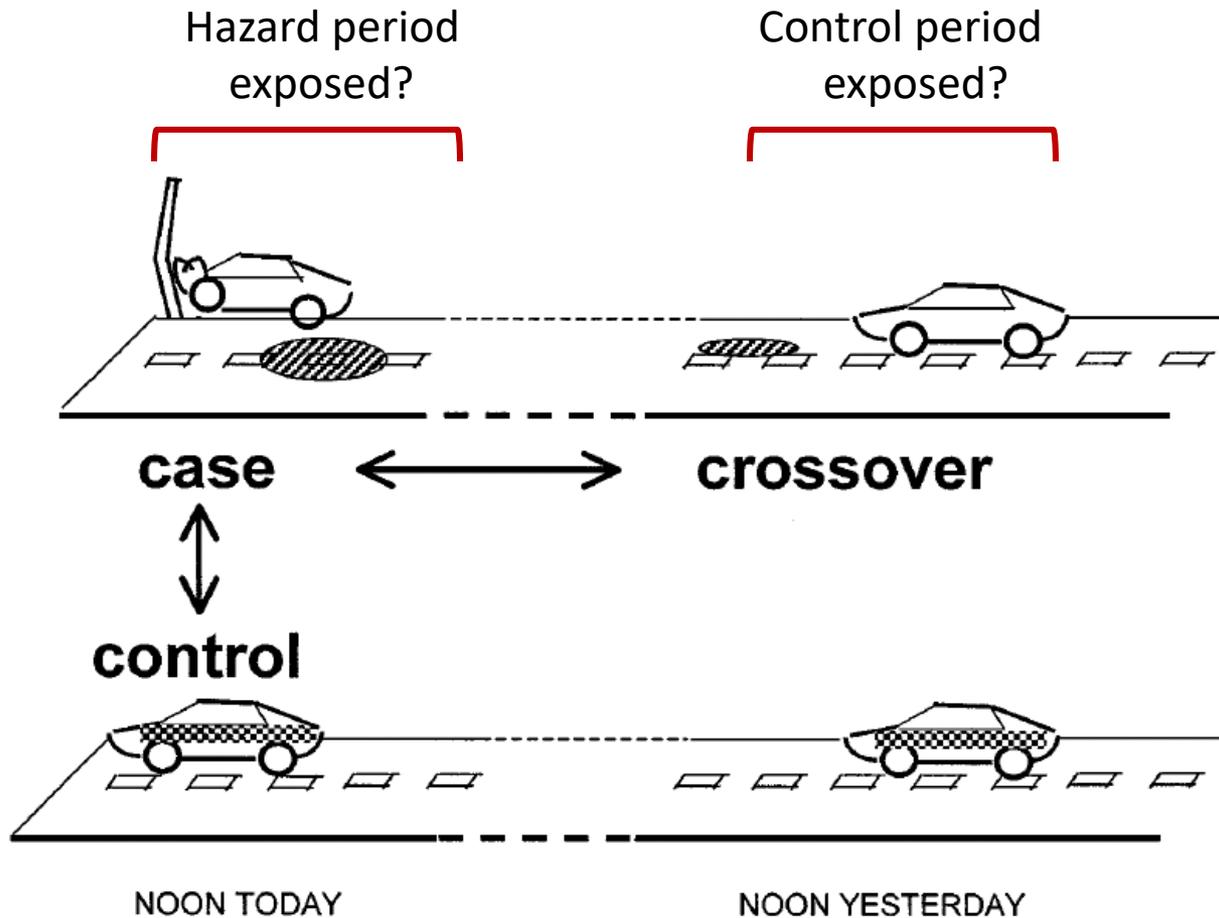


FIGURE 3. Raster surface layer of the level of a risk factor in the urban landscape as demonstrated using off-premise alcohol outlets (*top*). Raster surface layer of the urban landscape overlaid with path points marking locations of the daily activities of 632 study subjects (*bottom*).



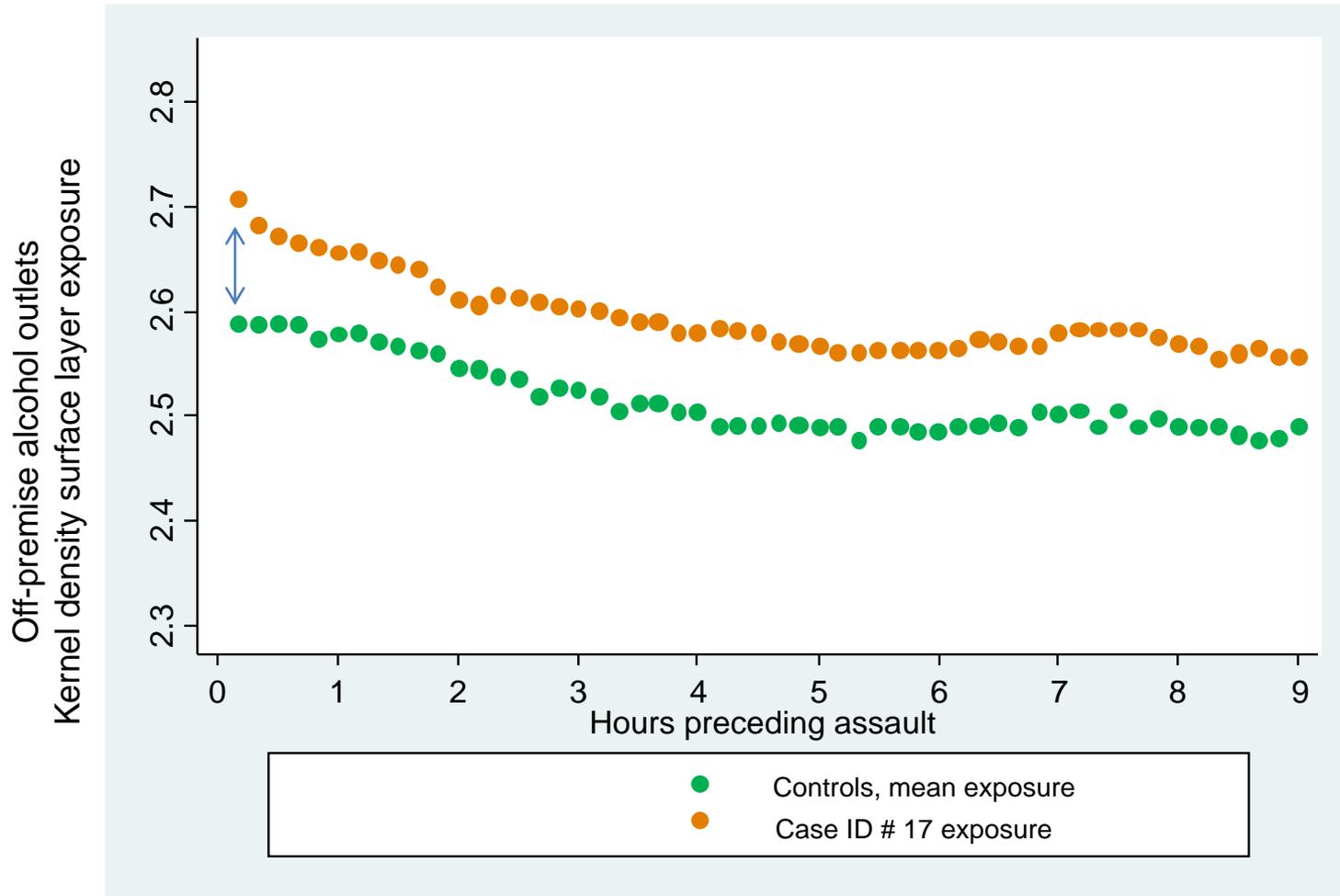
Mean levels of exposure to off-premise alcohol outlets experienced by GSW cases during 10-minute windows over the 9 hours preceding the assault, compared to the mean daily levels of exposure experienced by controls.

How unusual was this exposure?



The relation of the simplest case-crossover design to a traditional matched-pair case-control design.

Difference: .12, .11, .09, .09, .08.....



Mean levels of exposure to off-premise alcohol outlets experienced by one GSW case and by controls during 10-minute windows over the 9 hours preceding the assault.

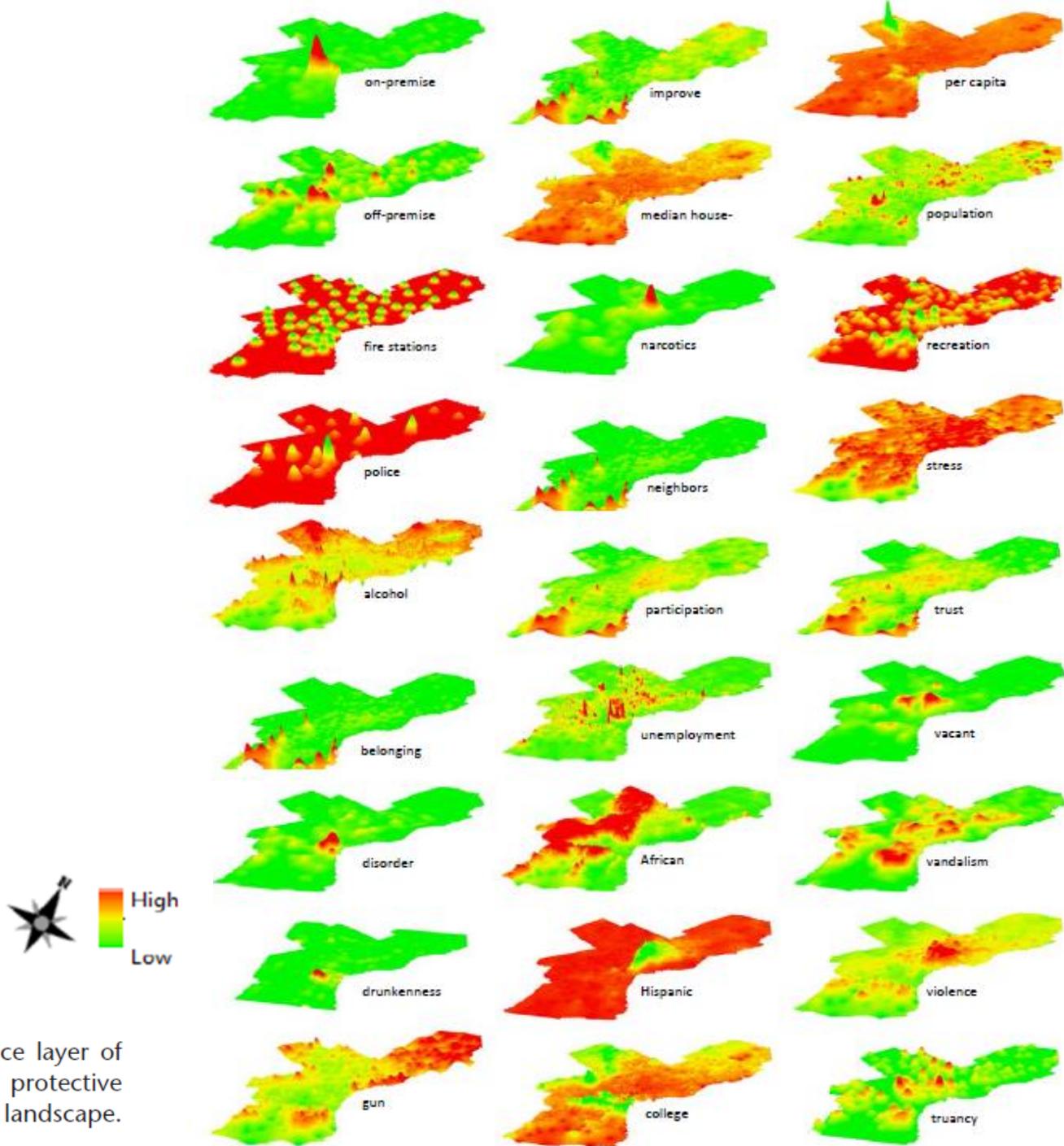
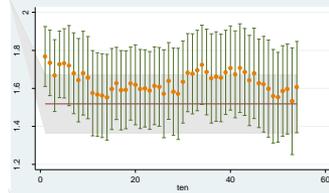
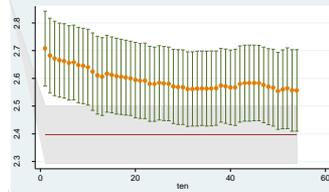


FIGURE 2. Raster surface layer of the 27 risk factors and protective factors across the urban landscape.

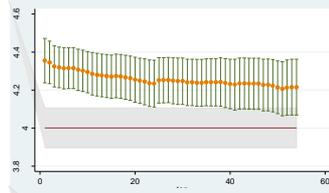
On premise alcohol outlets



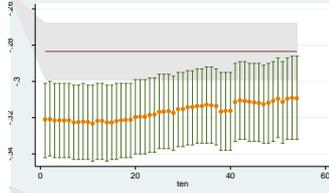
Off premise alcohol outlets



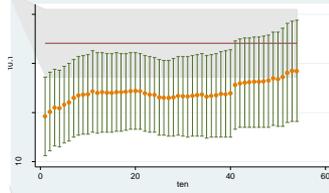
Structural disorder



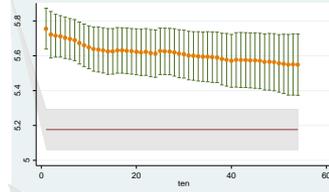
Improve neighborhood



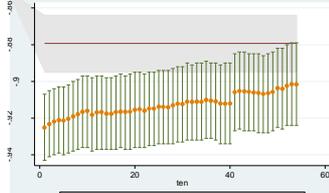
Median HH income



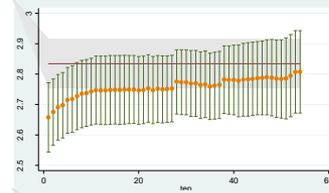
Narcotics arrests



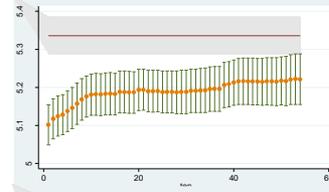
Participation In groups



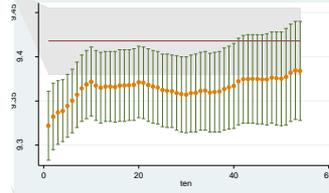
Per capita Hispanic



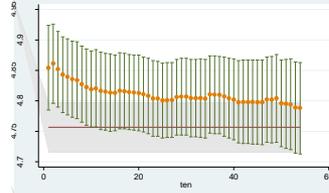
Per capita college educated



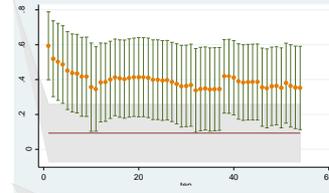
Per capita income



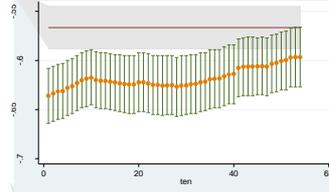
Population 15-24



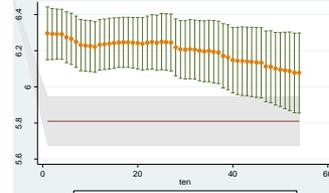
Recreation centers



Trust neighbors



Vacant lots



— particip1_cohi/particip1_colo — particip1_co
— particip1_cahi/particip1_calo — particip1_ca

— vacant_cohi/vacant_colo — vacant_co
— vacant_cahi/vacant_calo — vacant_ca

eTABLE 3. Six factors representing environmental constructs derived through factor analysis of 27 variables representing the built and social environment.

Factor	Variable	Factor loading						Expected correlation with violence
		1	2	3	4	5	6	
1. Neighbor connectedness								–
	belonging ¹	0.9						–
	improve ¹	0.8						–
	neighbors ¹	0.9						–
	participation ¹	0.8						–
	stress ¹	0.5						+
	trust ¹	0.5						–
2. Income								–
	median household income		0.9					–
	per capita income		0.8					–
	unemployment		-0.5					+
	alcohol expenditures		0.9					+
3. Alcohol outlets, drunkenness, disorderly conduct								+
	on-premise alcohol outlets			0.9				+
	off-premise alcohol outlets			0.8				+
	disorder arrests			0.7				+
	drunkenness arrests			0.9				+
4. Vacancy, vandalism, violence								+
	narcotics arrests				0.8			+
	% college education				-0.7			–
	vacant properties				0.5			+
	vandalism				0.7			+
	violence				0.7			+
5. Fire stations, police stations								–
	fire stations					0.9		–
	police stations					0.8		–
6. Race, ethnicity								–
	% population African American						-0.6	+
	% population Hispanic						0.8	–
		Eigenvalue:	5.9	4.3	3.0	1.7	1.5	1.2
		% of variance explained:	18%	17%	17%	17%	10%	8%

Environmental variables that did not load on a factor were household gun ownership¹, percent of the population between 15-24 years old, recreation centers, and truancy.

1. Survey question from the Southeastern Pennsylvania Household Health Survey (details below).

belong: "Please tell me if you strongly agree, agree, disagree, or strongly disagree with the following statement: I feel that I belong and am a part of my neighborhood." Proportion reporting strongly agree or disagree.

improve: "Have people in your neighborhood ever worked together to improve the neighborhood?"

TABLE 2. Results of Adjusted Case-control Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Time-matched Controls

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Individual and situational		
Alone	1.6 (1.3, 1.9) ←	1.3 (0.8, 2.4)
Location		
Indoors	Ref	Ref
Outdoors on foot	6.7 (2.6, 17.3) ←	2.1 (1.3, 3.6) ←
Car	5.5 (1.2, 25.3) ←	0.3 (0.1, 1.1)
Bus	0.1 (0.0, 0.1)	0.8 (0.1, 6.7)
Trolley	0.1 (0.0, 0.1)	1.6 (0.7, 3.6)

Modelled with conditional logistic regression stratified by time of day and adjusted for age, day of week and month.

^aA factor representing a construct derived from multiple variables.

^bThe item is a single variable as opposed to a composite item (i.e., factor).

n/a indicates not applicable; n/a^c, could not estimate; Ref, reference category.

Case-control analysis

TABLE 2. Results of Adjusted Case-control Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Time-matched Controls

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Weapon carrying		
None	Ref	Ref
Gun	2.7 (1.2, 4.1) ←	n/a ^c (n/a, n/a)
Other	0.8 (0.1, 4.3)	n/a ^c (n/a, n/a)
Alcohol consumption	0.7 (0.2, 2.1)	6.7 (3.1, 14.8) ←
Climate		
Precipitating	1.8 (0.8, 3.9)	0.7 (0.4, 1.1)

Modelled with conditional logistic regression stratified by time of day and adjusted for age, day of week and month.

^aA factor representing a construct derived from multiple variables.

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Case-control analysis

TABLE 2. Results of Adjusted Case-control Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Time-matched Controls

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Environment		
Neighbor connectedness ^a	0.7 (0.6, 0.8) ←	0.7 (0.6, 0.8) ←
Income ^a	0.7 (0.5, 1.1)	1.5 (0.9, 2.5)
Alcohol and social incivilities ^a	0.7 (0.6, 0.9) ←	0.9 (0.7, 1.1)
Vacancy, violence, and vandalism ^a	2.2 (1.6, 2.9) ←	1.5 (1.2, 1.8) ←
Fire and police stations ^a	1.6 (1.4, 1.8) ←	1.0 (0.8, 1.2)
Race and ethnicity ^a	1.5 (1.3, 1.8) ←	1.2 (1.1, 1.3) ←
Recreation centers ^b	1.1 (1.0, 1.3)	1.2 (1.1, 1.4) ←
Gun ownership ^b	1.6 (1.2, 2.1) ←	0.7 (0.6, 1.0)
Population 15–24 ^b	1.2 (1.1, 1.7) ←	1.2 (1.1, 1.4) ←
Truancy ^b	0.6 (0.4, 0.9) ←	1.3 (1.0, 1.8)

Modelled with conditional logistic regression stratified by time of day and adjusted for age, day of week and month.

^aA factor representing a construct derived from multiple variables.

^bThe item is a control variable in the analysis (e.g., comparison group).

n/a indicates not applicable; n/a, could not estimate; Ref., reference category.

Case-control analysis

TABLE 3. Results of Adjusted Case-crossover Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Times Preceding the Assault

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Individual		
Alone	1.0 (0.8, 1.5)	0.9 (0.7, 1.2)
Location		
Indoors	Ref	Ref
Outdoors on foot	4.5 (2.8, 7.3) ←	3.2 (2.2, 4.5) ←
Car	2.1 (1.5, 3.1) ←	0.4 (0.0, 8.1)
Bus	1.7 (1.4, 2.1) ←	1.0 (0.2, 1.3)
Trolley	1.3 (1.2, 1.4) ←	1.2 (1.0, 1.3)

Modelled with conditional logistic regression stratified by subject.

^aA factor representing a construct derived from multiple variables.

^bThe item is a single variable as opposed to a composite item (i.e., factor).

n/a^c indicates could not estimate.

Case-crossover analysis

TABLE 3. Results of Adjusted Case-crossover Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Times Preceding the Assault

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Weapon carrying		
None	Ref	Ref
Gun	1.4 (1.1, 1.6) 	n/a ^c (n/a, n/a)
Other	1.0 (0.6, 1.5)	n/a ^c (n/a, n/a)
Alcohol consumption	0.6 (0.1, 3.0)	1.0 (0.8, 1.3)
Climate		
Precipitating	1.3 (0.9, 2.1)	1.0 (0.8, 1.3)

Modelled with conditional logistic regression stratified by subject.

^aA factor representing a construct derived from multiple variables.

^bThe item is a single variable as opposed to a composite item (i.e., factor).

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Case-crossover analysis

TABLE 3. Results of Adjusted Case-crossover Analysis Comparing Gunshot and Nongunshot (All Ages) Case Subjects' Levels of Exposure to Individual and Situational Circumstances, Climate Characteristics, and Environmental Contexts at the Time of Being Assaulted Relative to Times Preceding the Assault

Variable	Gunshot Wound Assault	Nongunshot Wound Assault
	All Ages	All Ages
	OR (95% CI)	OR (95% CI)
Environment		
Neighbor connectedness ^a	0.8 (0.6, 1.3)	0.8 (0.6, 1.1)
Income ^a	0.8 (0.5, 1.2)	1.3 (0.8, 2.2)
Alcohol and social incivilities ^a	1.1 (0.8, 1.4)	0.9 (0.6, 1.3)
Vacancy, vandalism, and vandalism ^a	1.7 (1.1, 2.7) ←	2.3 (1.2, 4.6) ←
Fire and police stations ^a	1.3 (1.0, 1.9)	0.8 (0.5, 1.1)
Race and ethnicity ^a	0.9 (0.7, 1.2)	2.2 (1.2, 1.3) ←
Recreation centers ^b	1.1 (0.8, 1.6)	0.9 (0.6, 1.6)
Gun ownership ^b	0.9 (0.5, 1.6)	0.5 (0.3, 0.9)
Population 15–24 ^b	1.6 (1.0, 2.4)	0.8 (0.6, 1.2)
Truancy ^b	0.7 (0.5, 1.0)	1.6 (1.1, 2.5) ←

Modelled with conditional logistic regression stratified by subject.

^aA factor representing a construct derived from multiple variables.

^bThe item is a single variable as opposed to a composite item (i.e., factor).

n/a^c indicates could not estimate.

Case-crossover analysis

Challenges and alternative considerations

- Non-participation bias
 - landline RDD; income levels similar
- Only living cases
 - no reason to expect difference
 - 5 of 6 survive
 - proxy not feasible
- Information bias, poor recall, untruthful
 - recruitment/interview design incorporated many features to ensure confidentiality
 - high prevalence of socially undesirable behaviors at baseline
 - controls comparable to Youth Risk Behavior Survey
 - face validity of activities by group and time of day
 - Wiebe et al. Fear of violence associated with daily activities. J Ad Health 2011
 - the activity paths were used to derive effect estimates
 - aimed to study alcohol outlets, vacant lots, but never mentioned



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Douglas Wiebe, Winner of the 2017 Kenneth Rothman EPIDEMIOLOGY Prize

Epidemiology: July 2017 - Volume 28 - Issue 4 - p 469

doi: 10.1097/EDE.0000000000000683

Rothman Prize

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The Editors and Editorial Board of Epidemiology are pleased to announce the selection of Douglas Wiebe as the winner of this year's Rothman Epidemiology Prize. This award of \$5000 is funded from a private endowment and is given annually for the best paper published in the journal in the preceding year. The selection criteria are importance, originality, clarity of thought, and excellence in writing. Dr. Wiebe's winning paper, titled "Mapping Activity Patterns to Quantify Risk of Violent Assault in Urban Environments," appeared in our January 2016 issue. The paper used a temporal and spatial scale relevant to the dynamics of violent assault, and showed that gunshot assault risks included being alone, acquiring a gun, and entering areas with more vacancy, violence, and vandalism.

Dr. Wiebe is an Associate Professor of Epidemiology at the University of Pennsylvania Perelman School of Medicine and a Senior Fellow at the Center for Injury Research and Prevention.

Congratulations also to runners-up M. Maria Glymour and colleagues for their paper titled "Does Mother Know Best? Treatment Adherence as a Function of Anticipated Treatment Benefit" (March, 2016) and Takashi Yorifuji et al. for their paper titled "Fine-particulate Air Pollution from Diesel Emission Control and Mortality Rates in Tokyo: A Quasi-experimental Study" (November, 2016).

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As Violence Unfolds: A Space–Time Study of Situational Triggers of Violent Victimization Among Urban Youth

Beidi Dong¹ · Christopher N. Morrison² · Charles C. Branas² · Therese S. Richmond³ · Douglas J. Wiebe⁴

Published online: 25 June 2019
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Abstract

Objectives This study clarifies three important issues regarding situational or opportunity theories of victimization: (1) whether engaging in risk activities triggers violent assault during specific, often fleeting moments, (2) how environmental settings along individuals' daily paths affect their risk of violent assault, and (3) whether situational triggers have differential effects on violent assault during the day versus night.

Methods Using an innovative GIS-assisted interview technique, 298 young male violent assault victims in Philadelphia, PA described their activity paths over the course of the day of being assaulted. Case-crossover analyses compared each subject's exposure status at the time of assault with his own statuses earlier in the day (stratified by daytime and nighttime).

Results Being at an outdoor/public space, conducting unstructured activities, and absence of guardians increase the likelihood of violent victimization at a fine spatial–temporal scale at both daytime and nighttime. Yet, the presence of friends and environmental characteristics have differential effects on violent victimization at daytime versus nighttime. Moreover, individual risk activities appeared to exhibit better predictive performance than did environmental characteristics in our space–time situational analyses.

Conclusion This study demonstrates the value of documenting how individuals navigate their daily activity space, and ultimately advances our understanding of youth violence from a real-time, real-life standpoint.

Keywords Violent victimization · Situational triggers · Routine activities · Social disorganization · Spatio-temporal analysis

✉ Beidi Dong
bdong@gmu.edu

¹ Department of Criminology, Law and Society, George Mason University, 354 Enterprise Hall, 4400 University Drive, MS 4F4, Fairfax, VA 22030, USA

Objectives This study clarifies three important issues regarding situational or opportunity theories of victimization:

- 1) whether engaging in risk activities triggers violent assault during specific, often fleeting moments,
- 2) how environmental settings along individuals' daily paths affect their risk of violent assault, and
- 3) whether situational triggers have differential effects on violent assault during the day versus night.

“Triggers” for being assaulted

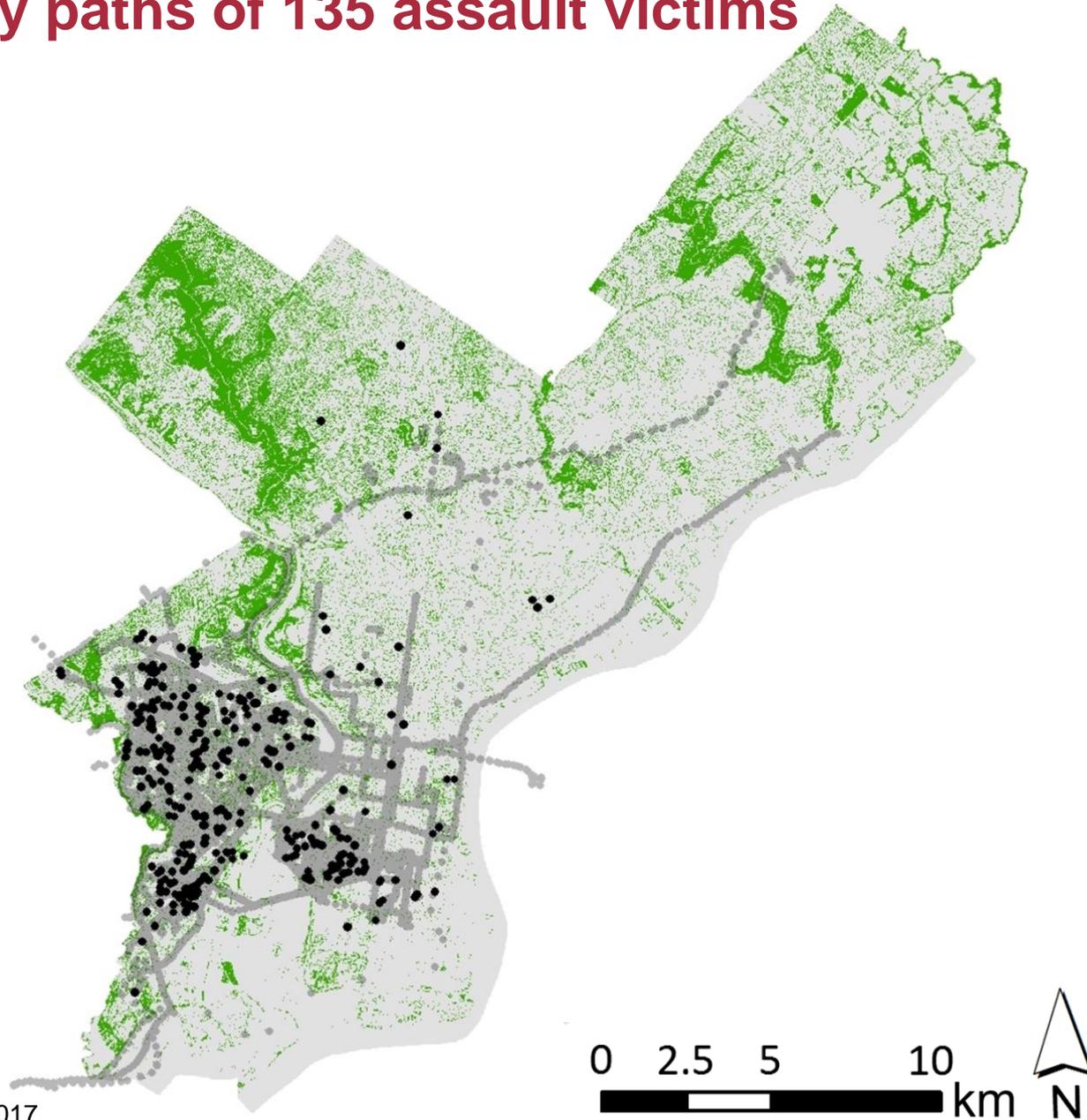
Table 3 Results of conditional logistic regressions comparing study subjects’ levels of exposure to situational elements at the time of being assaulted relative to times preceding the assault stratified by daytime versus nighttime

Variables	Daytime			Nighttime		
	b	RSE	OR	b	RSE	OR
Presence of friends	0.906*	0.443	2.475	-1.050**	0.379	0.350
Absence of adult guardians	1.551*	0.746	4.717	2.555**	0.801	12.870
Outdoor/public space	2.387***	0.367	10.879	2.673***	0.488	14.476
Unstructured activities	1.090**	0.416	2.974	0.792	0.416	2.207
Weapon carrying	–	–	–	1.878	2.708	6.537
Substance use	-1.766	0.928	0.171	-0.511	0.518	0.600
Environmental socioeconomic status	0.230	0.366	1.259	-0.133	0.261	0.875
Environmental institutional resources	-0.944*	0.403	0.389	0.265	0.255	1.303
Environmental collective efficacy	-1.058*	0.443	0.347	0.010	0.210	1.010
Environmental opportunities for crime	0.671*	0.280	1.957	0.867**	0.258	2.381
Environmental gun ownership	-0.477	0.259	0.620	0.470*	0.230	1.600

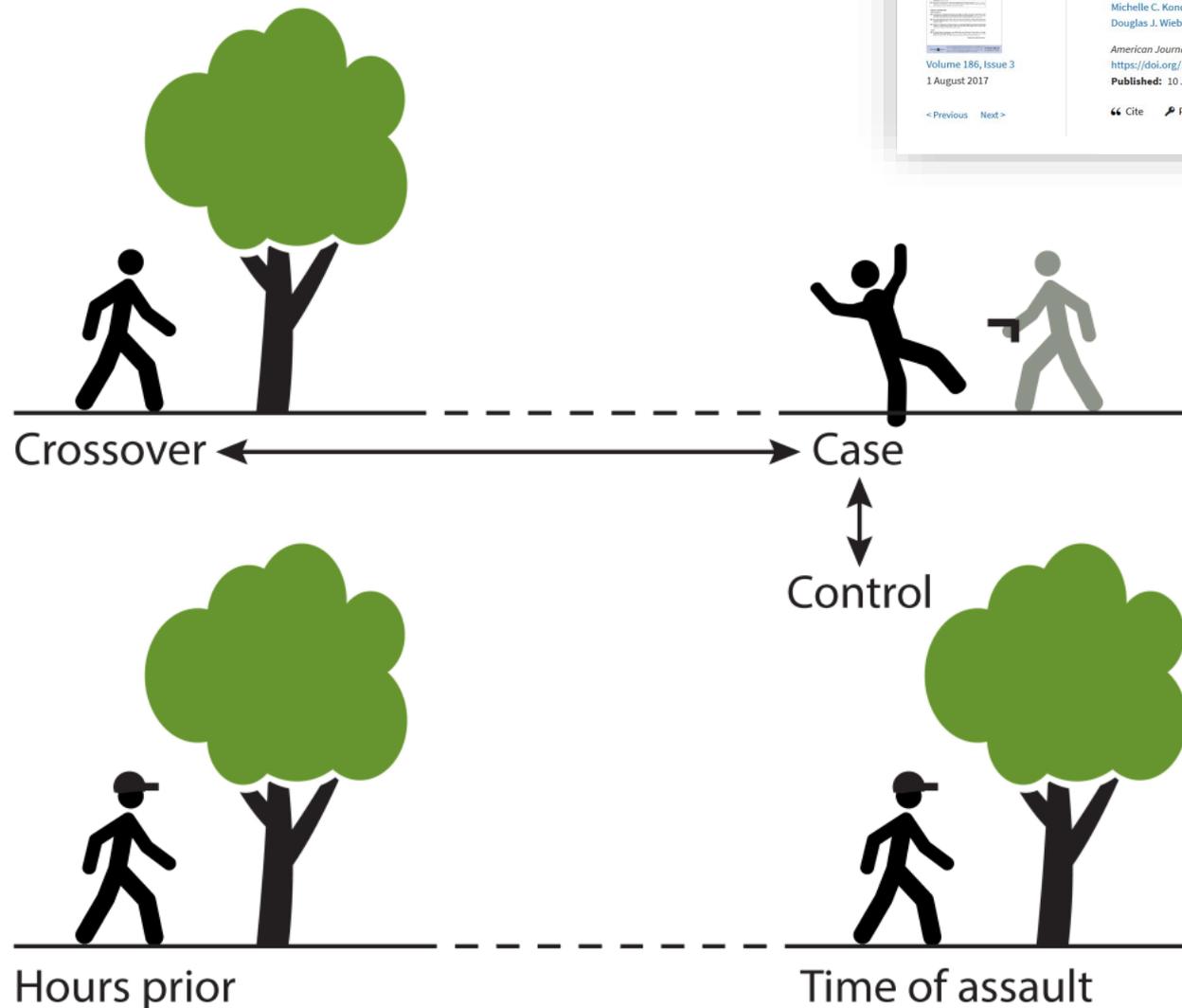
RSE robust standard error, OR odds ratio

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, two-tailed tests

Philadelphia tree canopy overlaid with shooting locations and activity paths of 135 assault victims



Tree cover protective against assault



Case-crossover

Tree cover

OR 0.55, 95%CI 0.34 - 0.89

Case-control

Tree cover

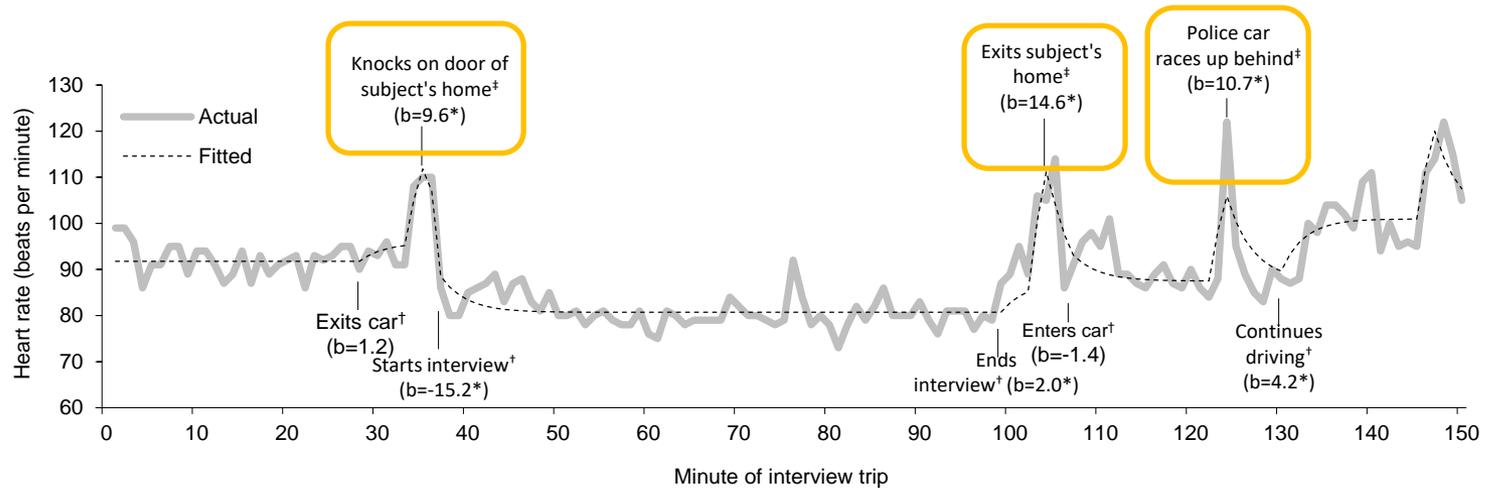
OR 0.70, 95%CI 0.55 - 0.88

GPS data for "risky path" case study



3917 ft

Stress associated with public health fieldwork



Interviewer's heart rate (actual and fitted) during a 150-minute interview trip from campus to a subject's home and back

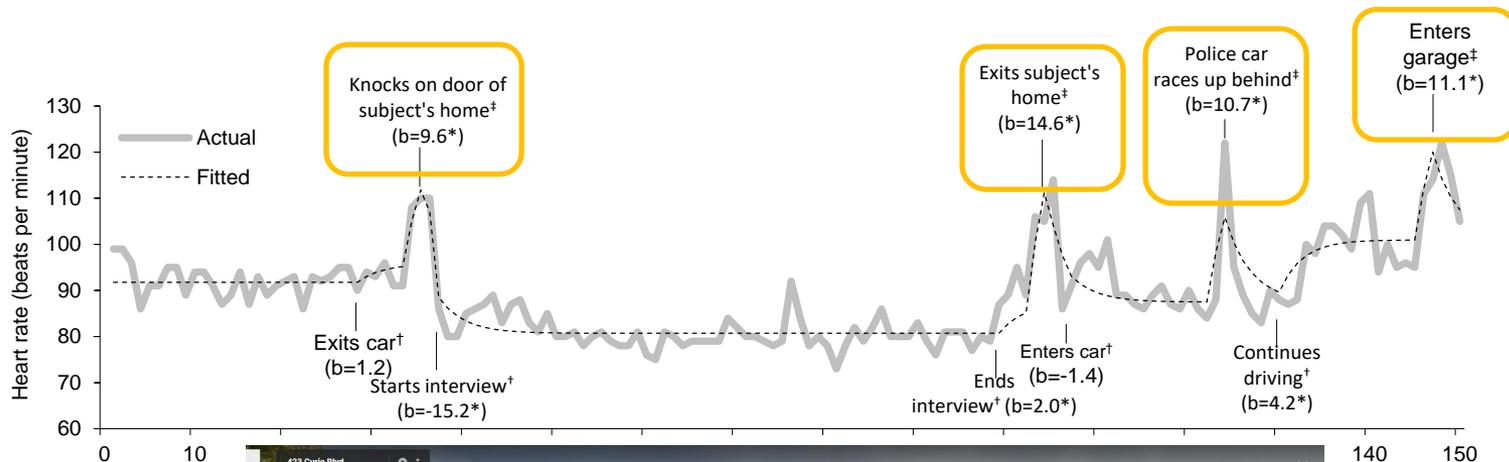
Note: Fitted results were derived from an autoregressive integrated moving average (ARIMA) (1,0,0) model ($\phi=0.2$, $p<0.05$; constant=91.8, $p<0.001$) that produced white noise residuals ($Q=27.3$ at 24 lags).

† Gradual, permanent heart rate change modeled with a first order transfer function applied to a step variable. Denominator was constrained to 0.7.

‡ Abrupt, temporary heart rate change modeled with a first order transfer function applied to a pulse variable. Denominator was constrained to 0.7.

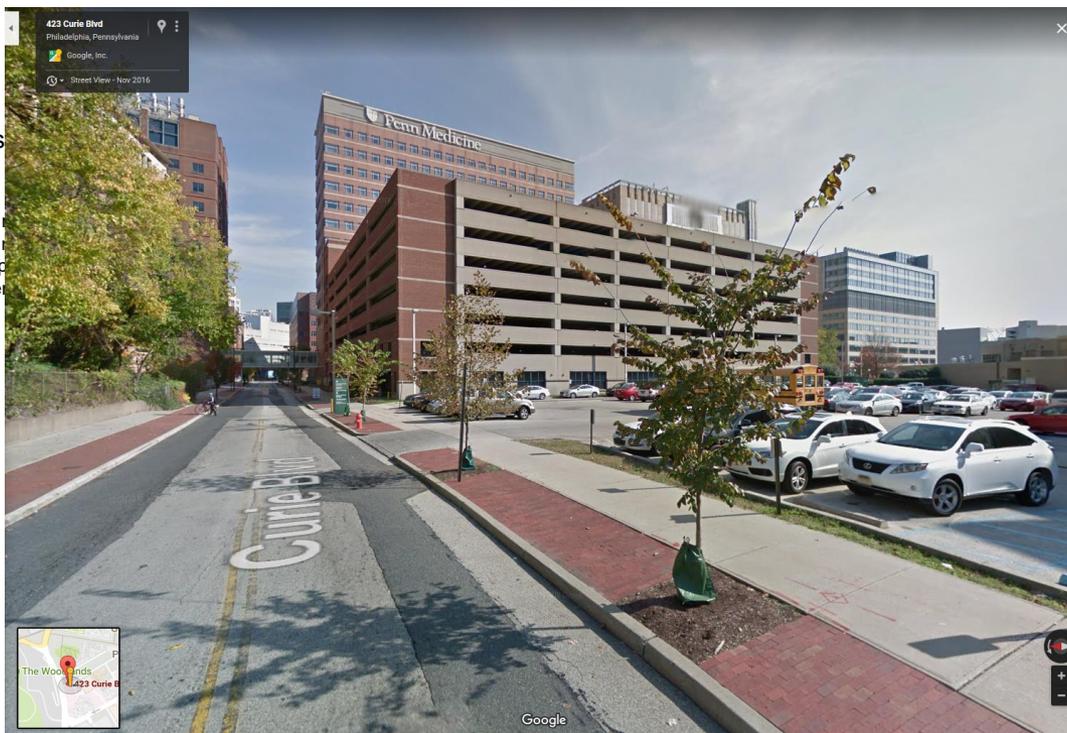
* $p<0.05$

Stress associated with public health fieldwork



Interviewer's

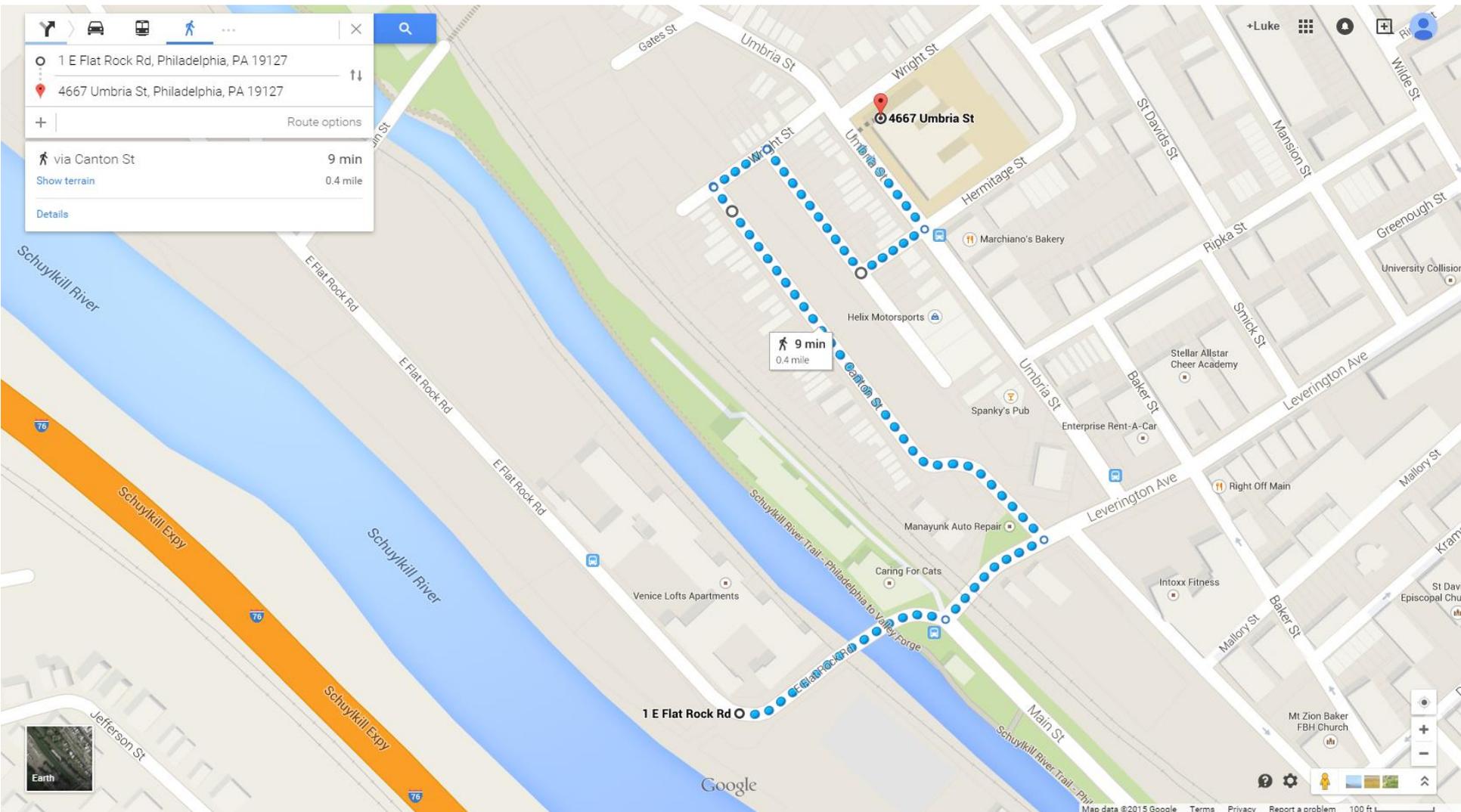
Note: Fitted
white
† Gradual, p
‡ Abrupt, test
* p<0.05



and back

0.001) that produced
to 0.7.
> 0.7.

“Risky path” virtual walk evaluated in lab setting with eye tracking software



“Risky path” virtual walk evaluated in lab setting with eye tracking software







Stimulus: Composite4
Change Stimulus: [grid icon]

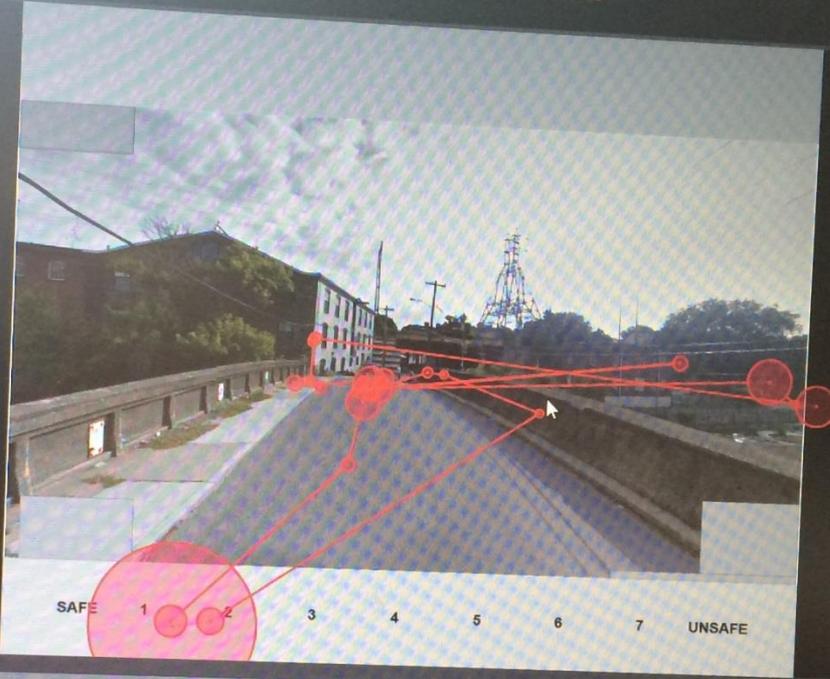
Subjects (1/2)
Select all Filter

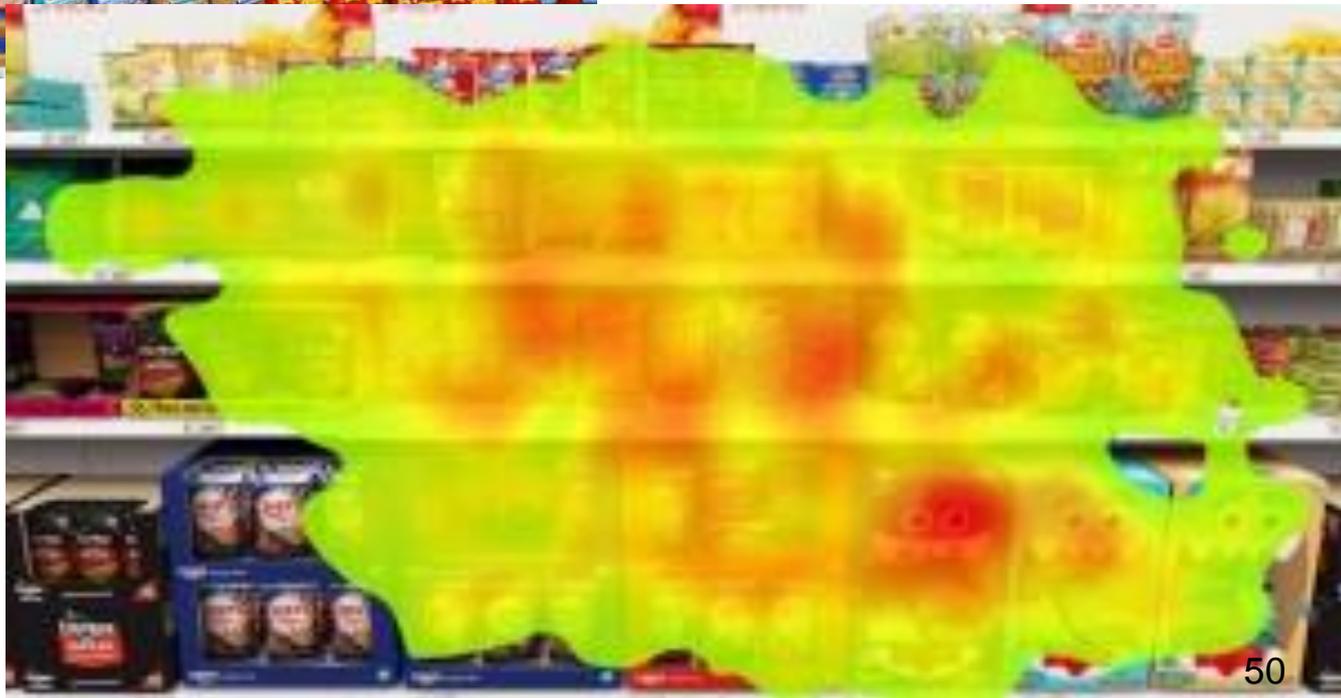
Subject	Trial	Color
test001	Trial005	[blue square]
DW	Trial005	[red square]

Eye Events for DW
User Events for DW
Details for DW

Property	Value
Length	00:00:08.281
Sampling rate	60 Hz
Eye(s)	Both
Number of samples	493
Number of fixations	51
Number of saccades	51

Webcam for DW





Prospect, Refuge, Escape

- At this point, how open is your view of the immediate environment? Is it open or limited by building or other features?
- At this point, how many possible hiding places are there right close by for potential attackers?
- At this point, how hard would it be to escape from this location if you wanted to?

Nasar/Fisher model of site-level fear-inspiring features.

Wang & Taylor. Simulated walks through dangerous alleys: impacts of features and progress on fear. J Environ Psyc 2006.

Safety/fear

- How safe would you feel walking in this location?





Near
CANTON ST



PAID

420

TRASH















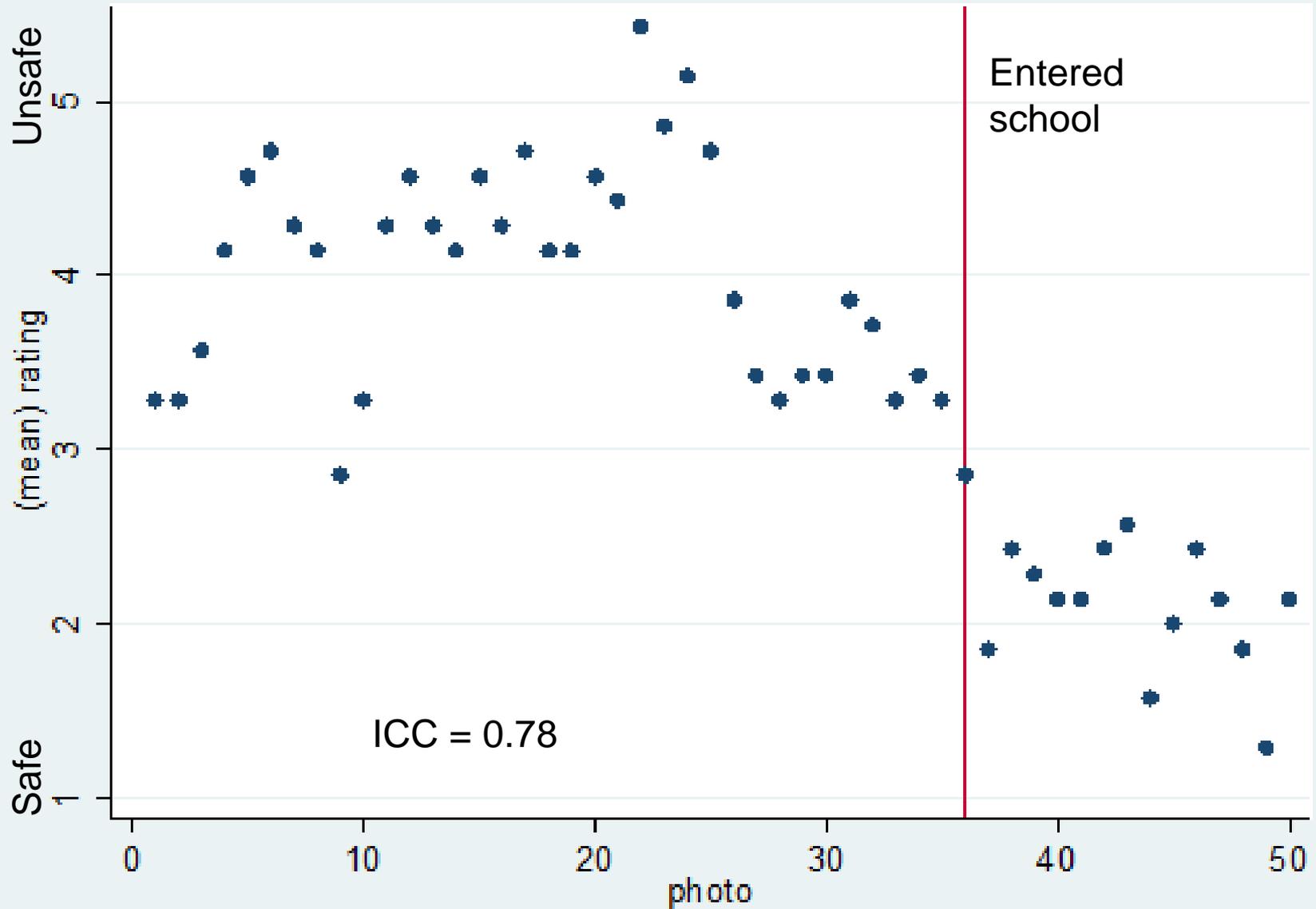




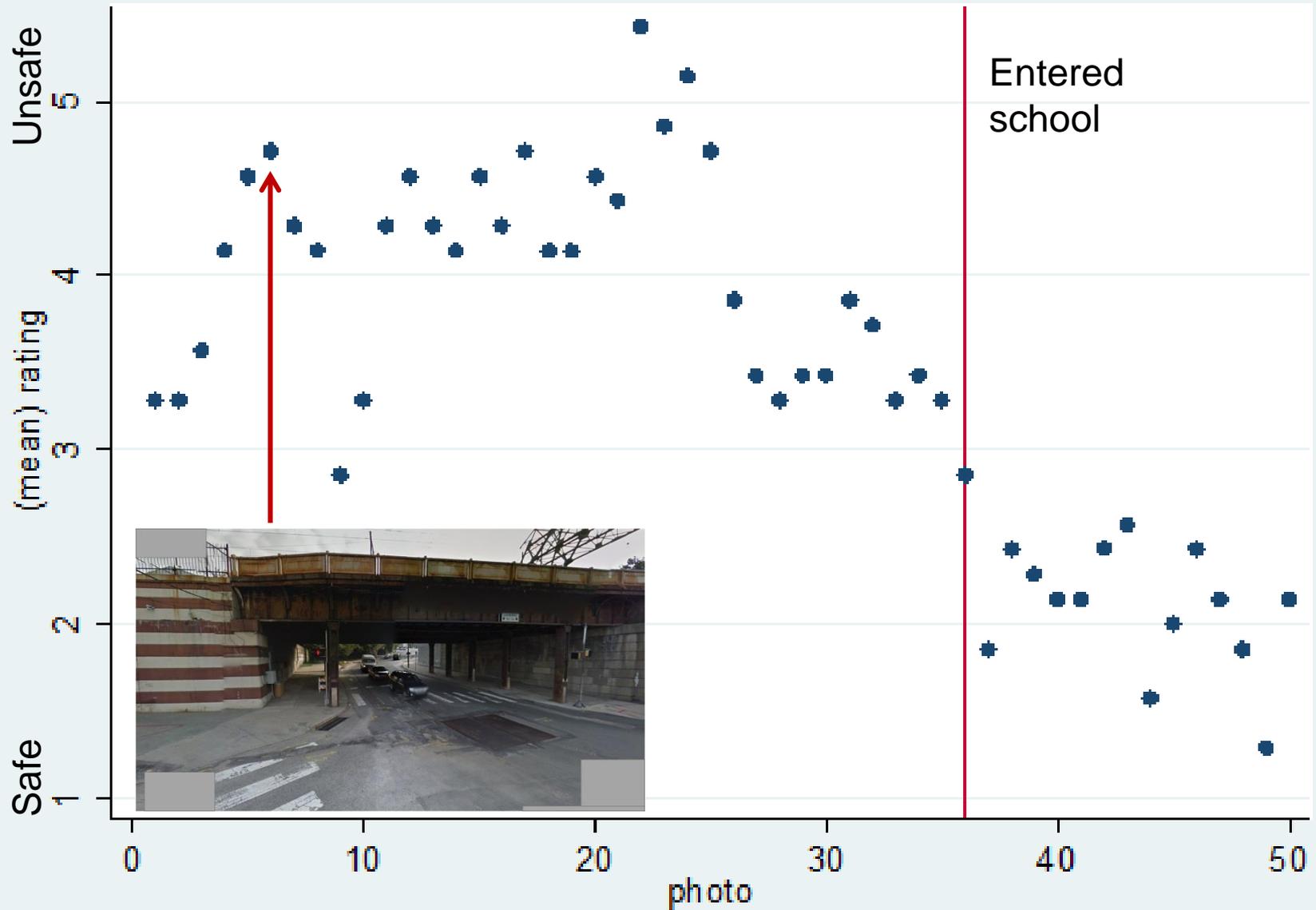


Phanatic
comcast

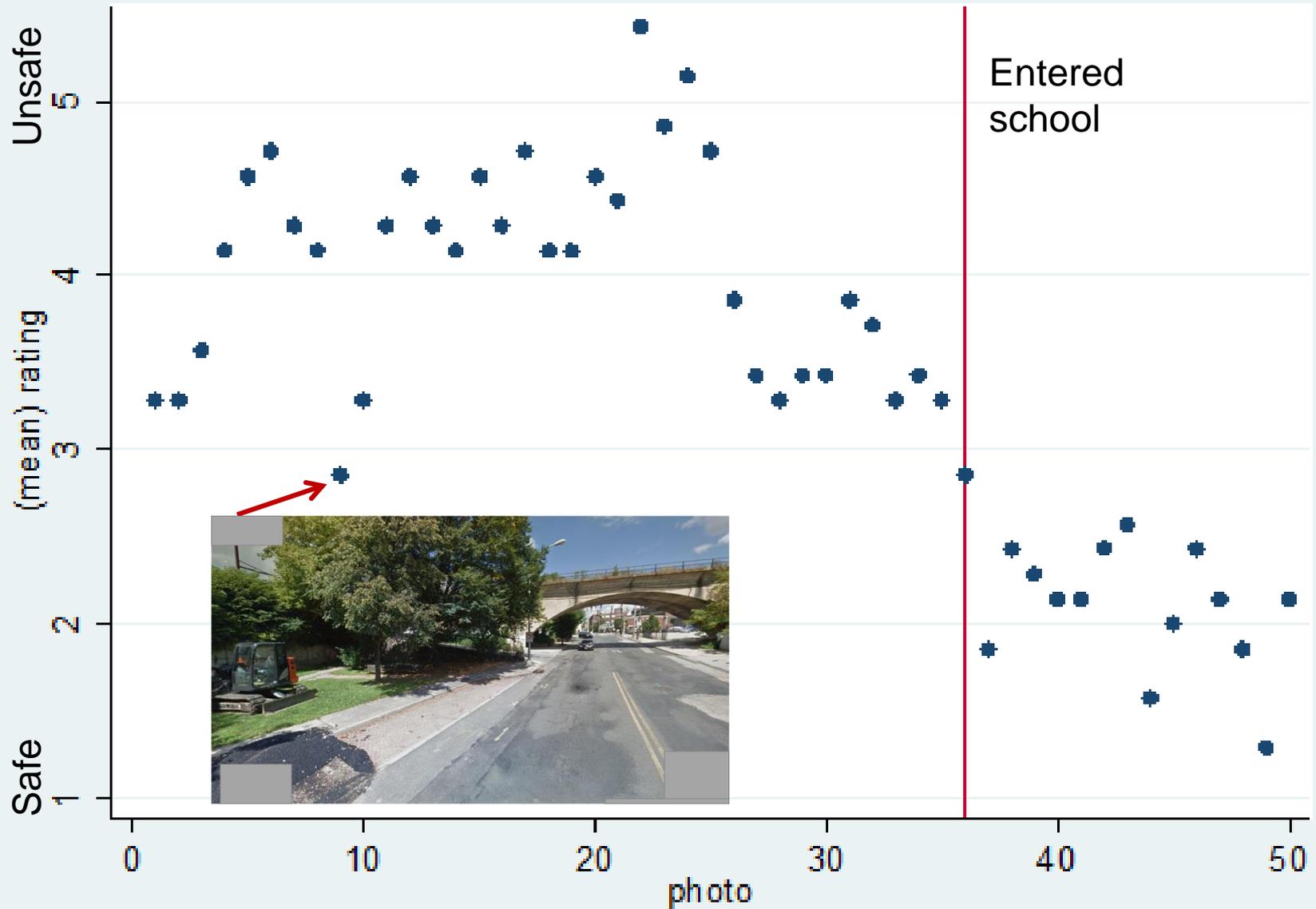
7 subjects' ratings of fear of assault



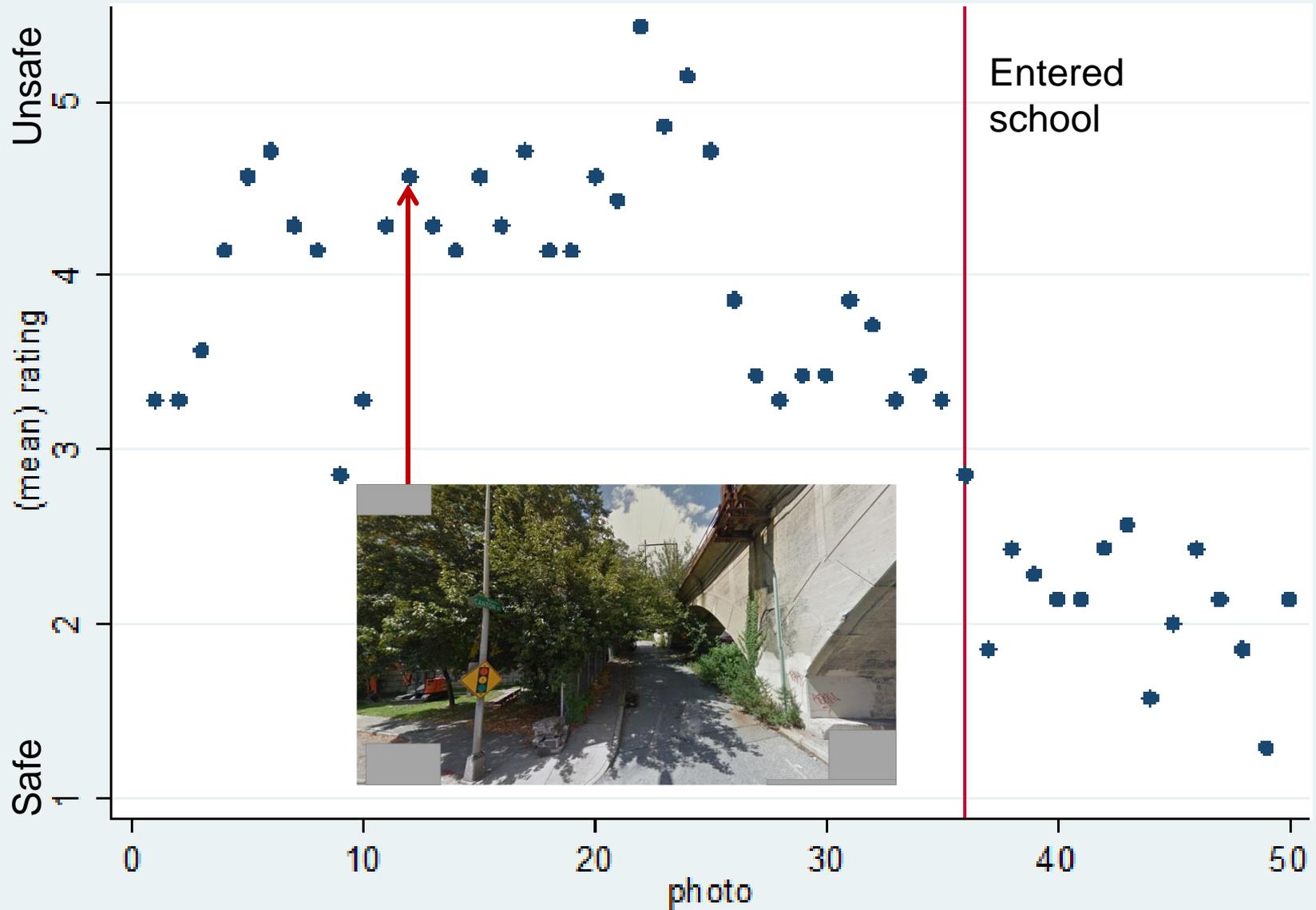
7 subjects' ratings of fear of assault



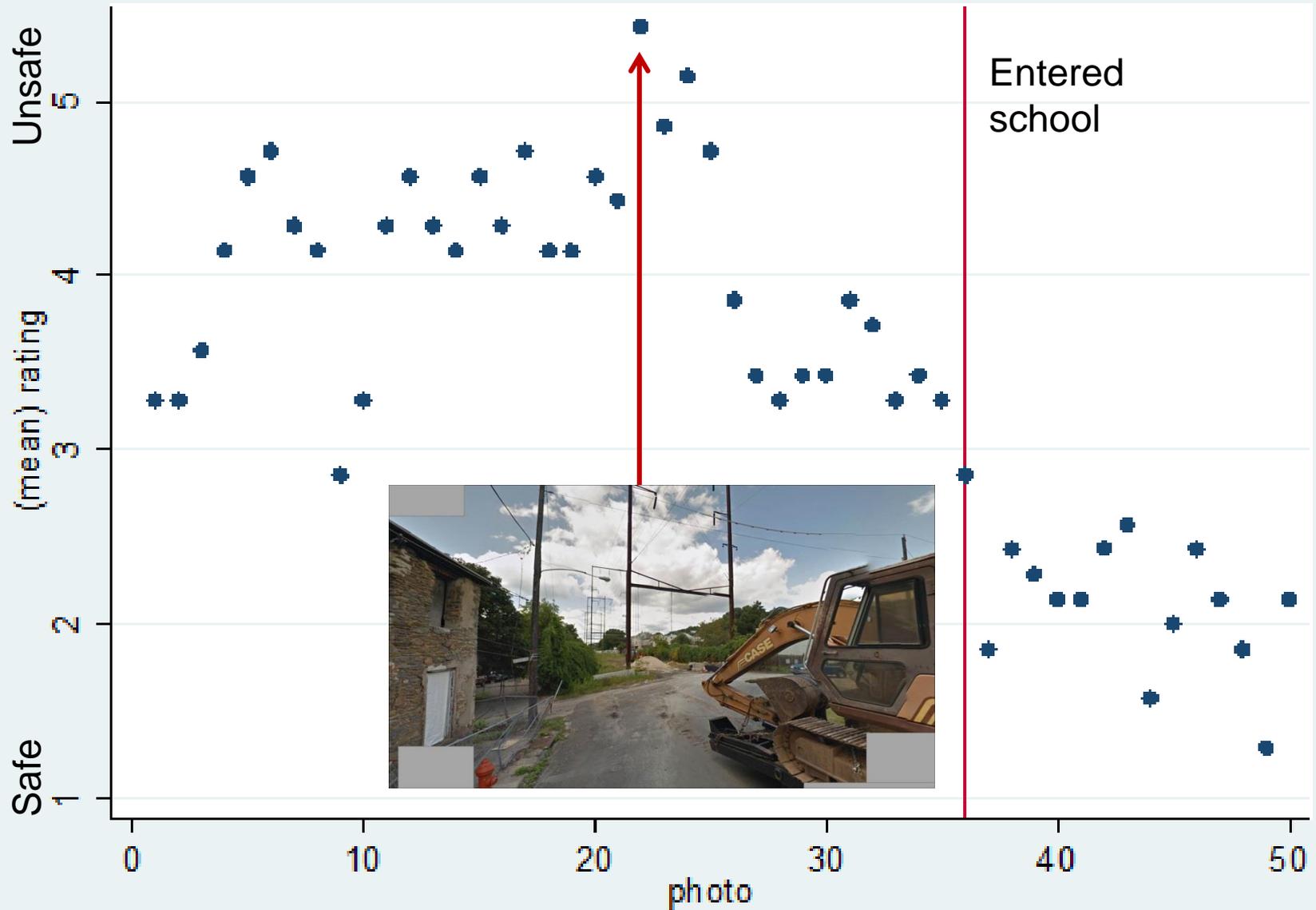
7 subjects' ratings of fear of assault



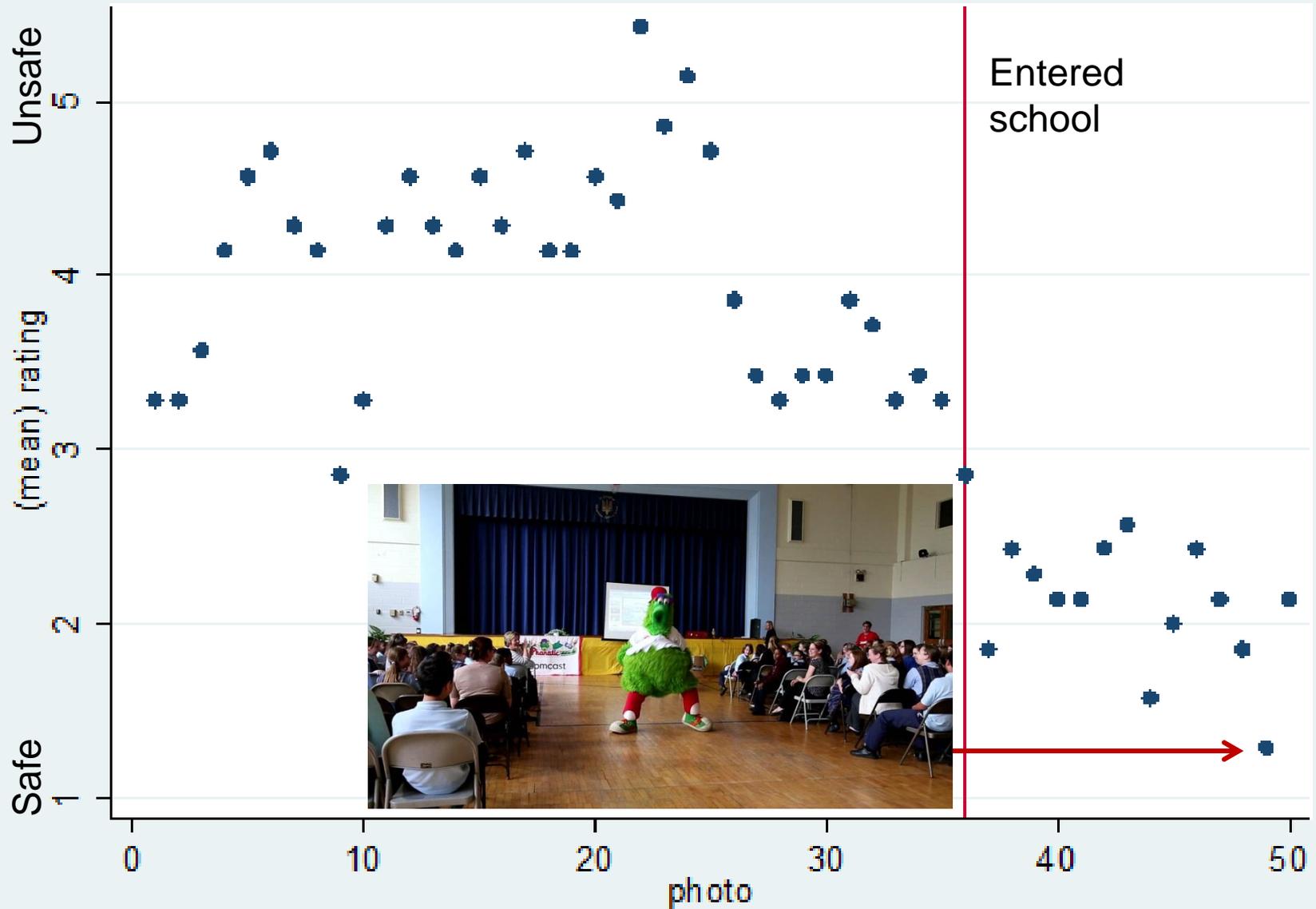
7 subjects' ratings of fear of assault



7 subjects' ratings of fear of assault



7 subjects' ratings of fear of assault



Limited prospect, many refuge and limited escape
prospect=0, refuge=0, escape=0
000



Limited prospect, many refuge and limited escape
prospect=0, refuge=0, escape=0
000



Limited prospect, many refuge and limited escape
prospect=0, refuge=0, escape=0
000



Open prospect, no refuge and easy escape
prospect=1, refuge=1, escape=1
111



Open prospect, no refuge and easy escape
prospect=1, refuge=1, escape=1

111

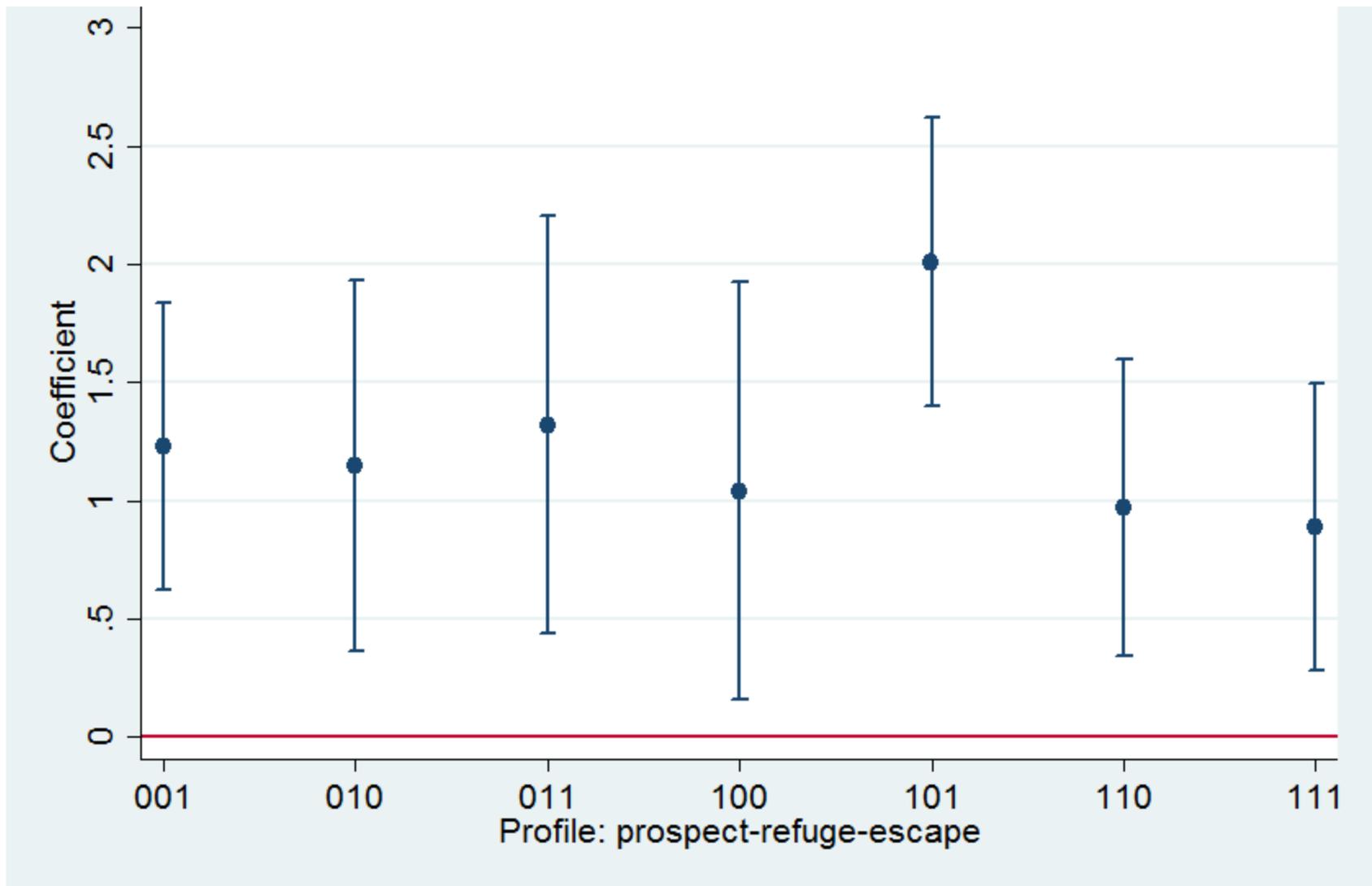


Open prospect, no refuge and easy escape
prospect=1, refuge=1, escape=1

111



Mean reported safety in different contexts relative to the context of the most dangerous prospect, refuge and escape



Profile 000 is the reference group

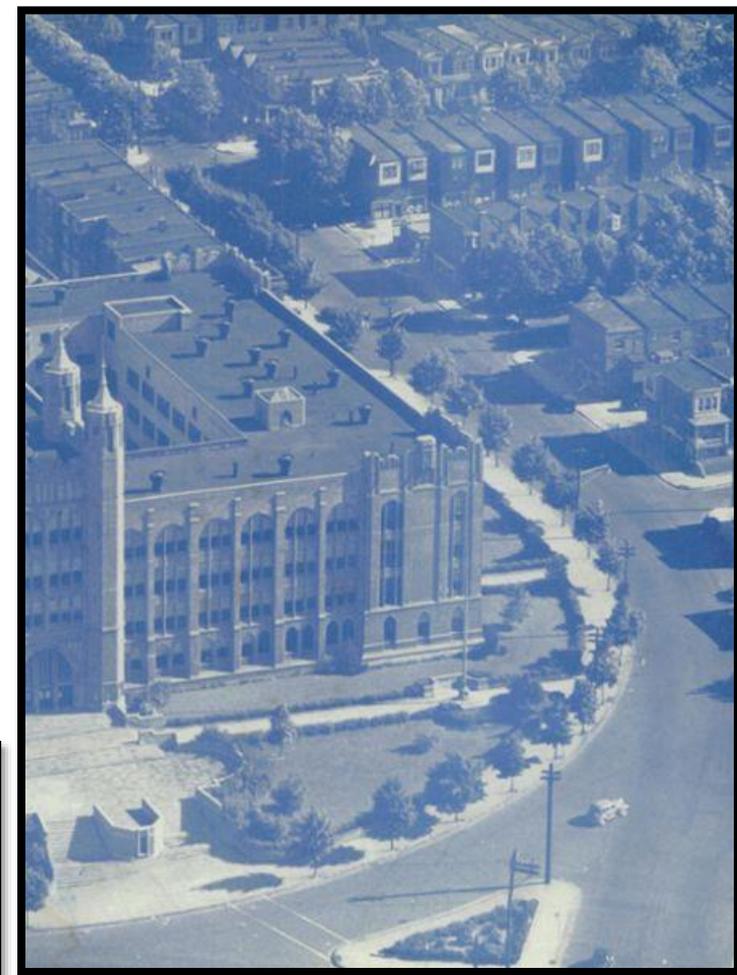
Space-time Study of Youth and School Violence

Doug Wiebe, PhD
Therese Richmond, PhD RN
Bernadette Hohl, MPH PhD
Kate McDonald, PhD RN
Charles Branas, PhD
Wen Guo, PhD



NIJ award 2014-CK-BX-0008
Application 2014-91360-PA-IJ

2016-2020



Overbook High School, Philadelphia, est. 1924



Interview ID: 35
 Creation Time: 10/27/2013 15:01
 Last Update: 10/27/2013 17:05
 Interviewer: Interviewer 1
 Closed?:
 Remarks:

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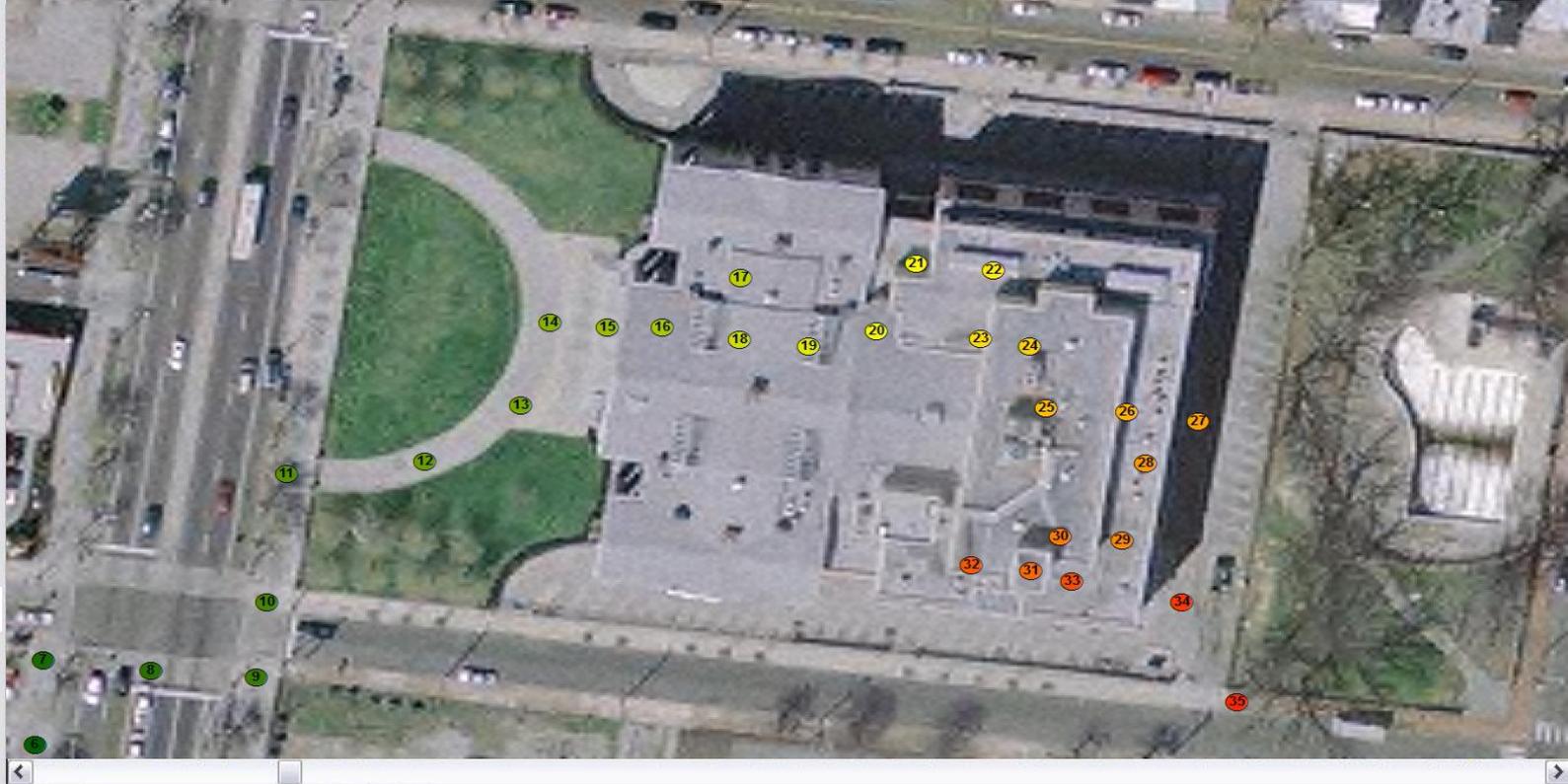
8 of 9 Interviews

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View: Detail Street Aerial

Point	DateAndTime	TransMode	Location	Activity	Safety	Weapon	Substance	Companion	Pros/ref/esc	Indoors	Assault
16	10/24/13 7:23 AM	On Foot	Hallway	going to class	9	None	None	None	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17	10/24/13 7:25 AM	None	Classroom 1	in class	10	None	None	Classmates/Teacher	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18	10/24/13 8:58 AM	On Foot	Hallway	walking between classes	9	None	None	Friends	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19	10/24/13 9:00 AM	None	Classroom 2	in class	10	None	None	Classmates/Teacher	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20	10/24/13 10:32 AM	On Foot	Stairway	walking between classes	9	None	None	Friends	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
21	10/24/13 10:34 AM	On Foot	Hallway	walking between classes	8	None	None	None	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
22	10/24/13 10:35 AM	None	Classroom 3	in class	10	None	None	Classmates/Teacher	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
23	10/24/13 11:37 AM	On Foot	Stairway	walking to lunch	9	None	None	None	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
24	10/24/13 11:41 AM	On Foot	Hallway	walking to lunch	9	None	None	Friends	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
25	10/24/13 11:43 AM	None	Cafeteria	eating lunch	9	None	None	Friends	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26	10/24/13 12:19 PM	On Foot	Hallway	going outside	9	None	None	Friends	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
27	10/24/13 12:21 PM	On Foot	School yard	recess	8	None	None	Friends	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	10/24/13 12:37 PM	On Foot	Bathroom	going to the bathroom	6	None	None	None	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
29	10/24/13 12:29 PM	On Foot	Hallway	going to class	9	None	None	None	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
30	10/24/13 12:40 PM	None	Classroom 4	in class	10	None	None	Classmates/Teacher	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
31	10/24/13 1:27 PM	On Foot	Hallway	going to class	8	None	None	None	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
32	10/24/13 1:30 PM	None	Classroom 5	in class	10	None	None	Classmates/Teacher	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
33	10/24/13 2:15 PM	On Foot	Hallway	leaving school	8	None	None	Friends	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
34	10/24/13 2:17 PM	On Foot	Sidewalk	leaving school	5	None	None	None	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	10/24/13 2:18 PM	On Foot	Sidewalk	getting jumped	5	None	None	Attackers	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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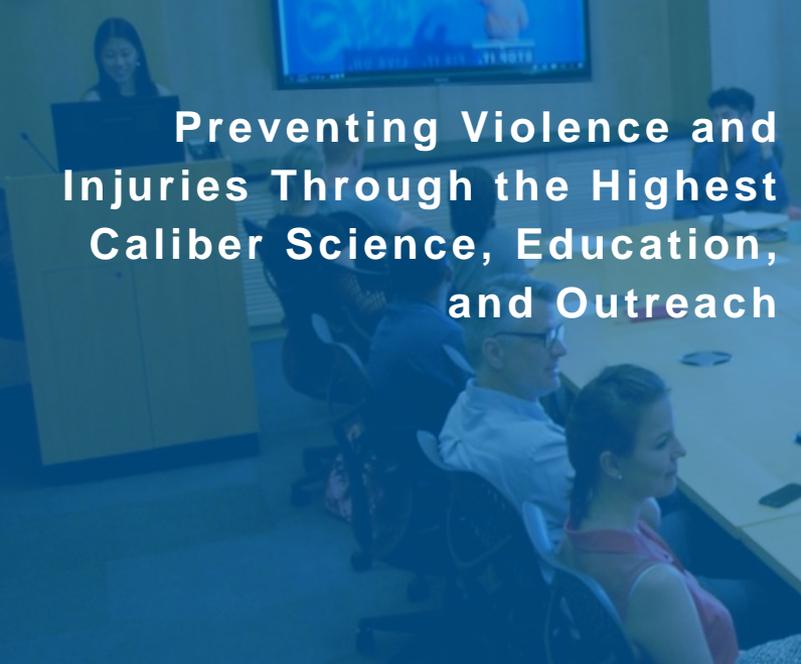
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@DouglasWiebe  @PennInjury