

# Neighborhood Safety and Physical Activity among New York City Adults

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## BACKGROUND

Qualitative research suggests **lack of safety deters physical activity**, but quantitative findings have been more **mixed**.

To date few studies have used both **independently observed** and **subject-reported measures** of both neighborhood safety features and physical activity in order to test different hypotheses in the same subjects.

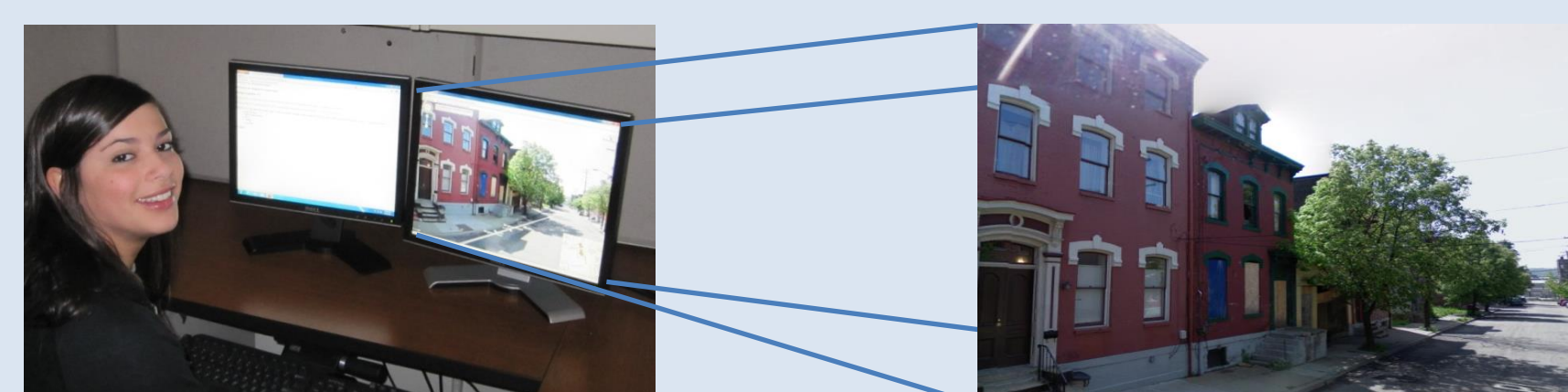
We tested three complementary theories relating neighborhood safety to activity:

- 1) Observed safety measures influence activity by affecting perceptions of safety.
- 2) Neighborhood disorder may deter activity both directly through the aesthetic displeasure of experiencing a chaotic environment and indirectly as a root cause of crime, which itself deters activity.
- 3) Subject's tendencies to report positively or negatively may create artifactual associations between perceptions of safety and activity

## METHODS

This study used data from the New York City Physical Activity and Transit (PAT) survey, which included both a random-digit dial survey representative of adult residents of New York City and a follow up portion, in which a subset of respondents were **accelerometer** and GPS devices for one week in March-November of 2011. This analysis included the 509 PAT subjects who had 4 or more 10+ hour days of GPS and accelerometer data. We used the accelerometer data to compute daily average moderate-equivalent minutes of physical activity. The survey also included **self-reported** information on: (1) demographic characteristics, (2) **physical activity**, and (3) whether crime made it **unsafe** to walk in their neighborhood during the day.

We geocoded subject home addresses and computed levels of **homicide and disorder** in **1km radial buffers** around home addresses. The homicide measure was estimated from the New York Times website's reports from 2005-2010 using kernel density methods. The disorder measure was constructed by **virtual street audit** using the Computer Assisted Neighborhood Visual Assessment System (CANVAS) with Google Street View imagery. Most disorder audit items were developed from measures used by the Project for Human Development in Chicago Neighborhoods for videotape-based street audits.



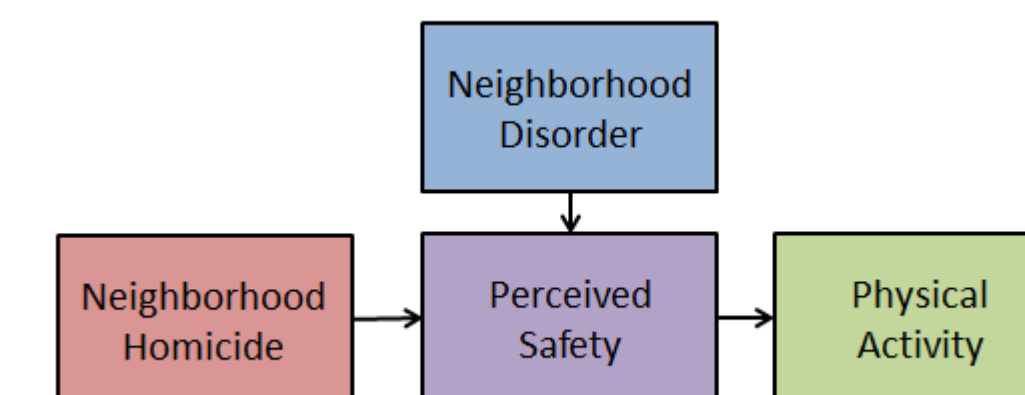
The CANVAS System for Virtual Street Audits

Google® Street View Imagery

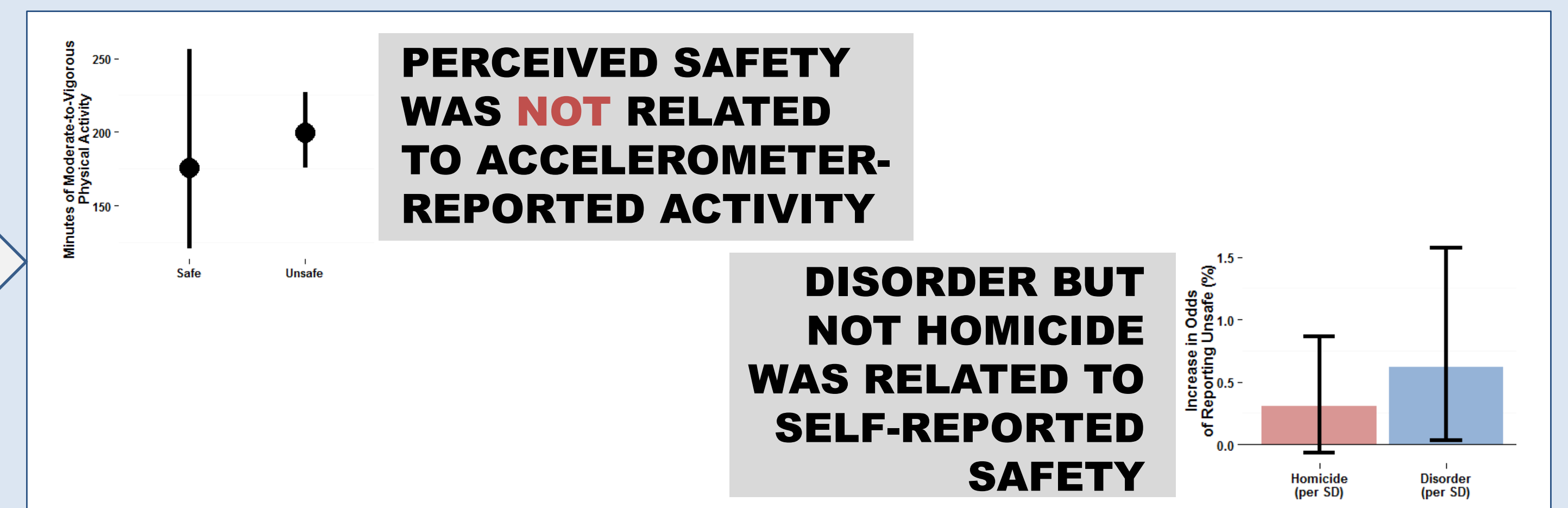
All analyses used **complex survey weights** to demographically reflect New York City as a whole based on the 2006-2008 American Community Survey.

## RESULTS

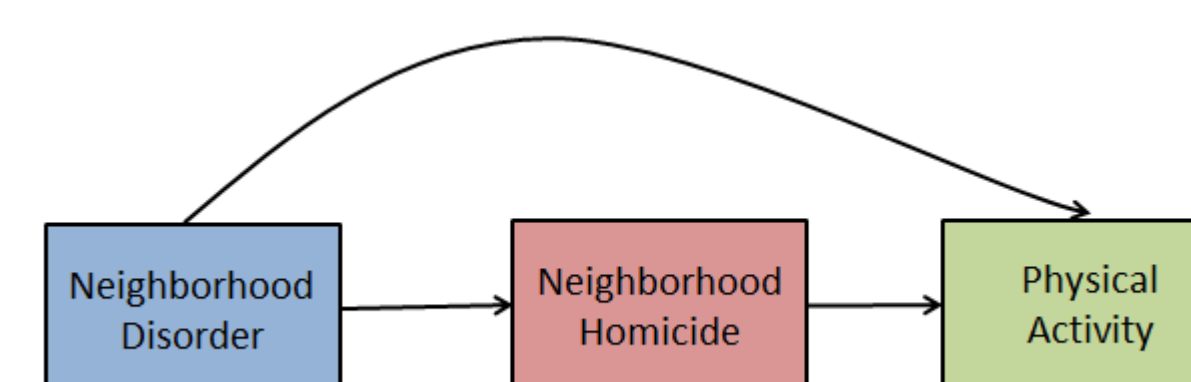
### THEORY 1: DISORDER AND HOMICIDE INDUCE FEAR, WHICH CONSTRAINS ACTIVITY



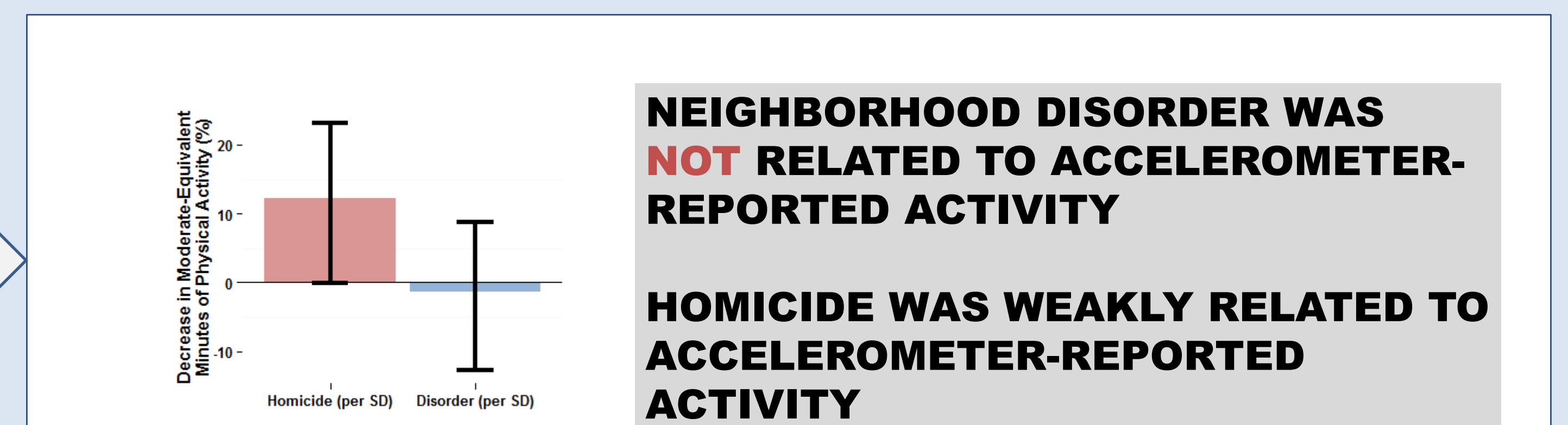
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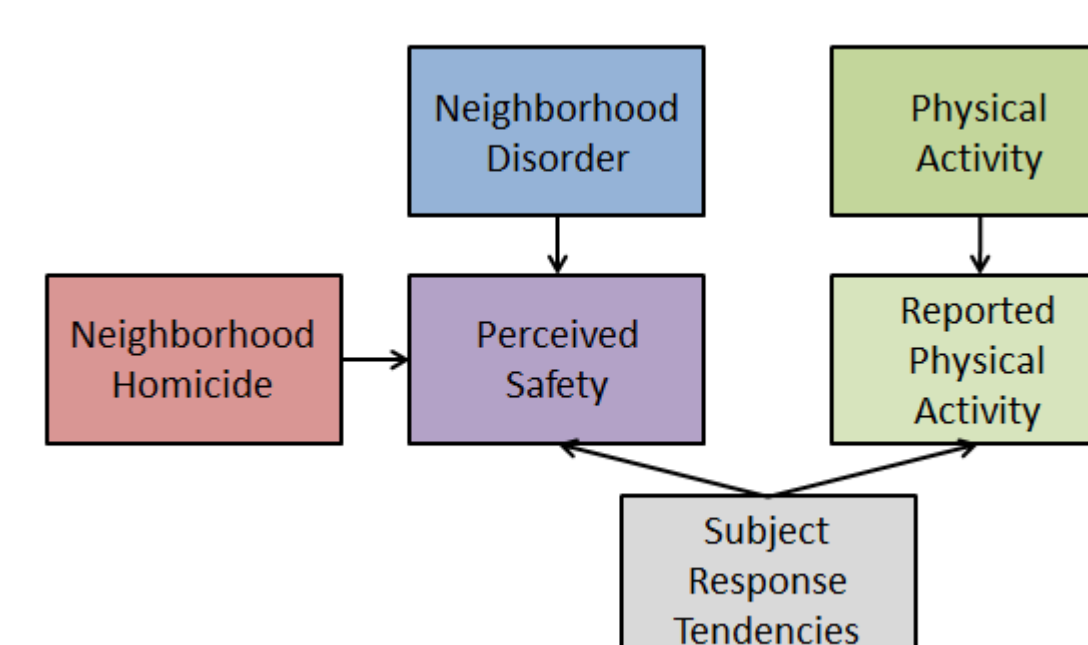
### THEORY 2: NEIGHBORHOOD DISORDER IS A ROOT CAUSE OF BOTH HOMICIDE AND INACTIVITY



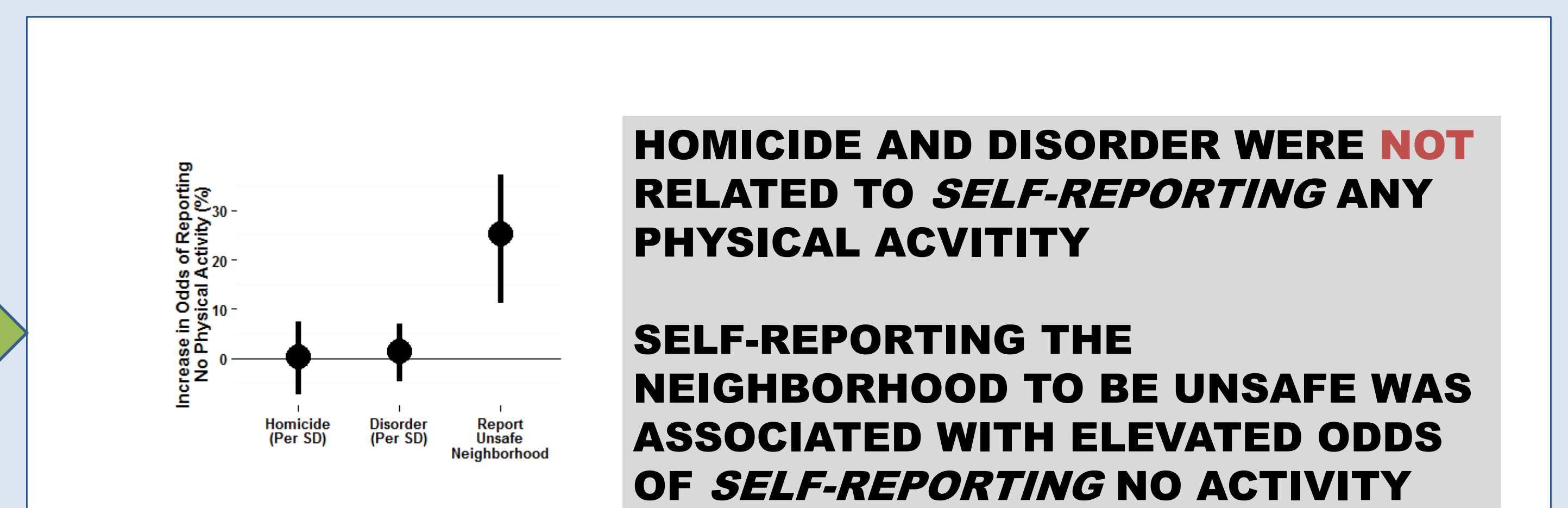
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### THEORY 3: REPORTED UNSAFETY AND INACTIVITY ARE LINKED BY SAME-SOURCE BIAS



SUPPORTED



## KEY LIMITATIONS

- Cross-sectional design does not allow us to account for neighborhood self-selection
- Small sample size increases risk of false negative associations
- Potential for measurement error due to participant non-compliance
- Perceived safety measure was one dichotomous item and may not be sensitive to small-scale variation in safety perceptions
- 1 km radial buffer may not be the most relevant neighborhood definition

## CONCLUSIONS

- Fear of crime does not appear to deter physical activity
- Disorder appears to influence fear of crime, but does not appear to deter physical activity
- High levels of homicide in a neighborhood may deter physical activity among nearby residents
- Researchers should be cautious not to over-interpret associations between self-reported neighborhood safety and self-reported activity

## CONTACT AND FUNDING ACKNOWLEDGEMENT

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