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Does perceived safety influence the effectiveness of a walking-group intervention designed to promote physical activity?

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Abstract

Purpose—To examine whether perceived safety modified the effectiveness of the Walk Your Heart to Health (WYHH) intervention in promoting physical activity and reducing central adiposity in predominantly non-Latino Black (henceforth Black) and Latino communities.

Design—A cluster randomized controlled design with a lagged intervention group.

Setting—Community-based and faith-based organizations in Black and Latino communities.

Subjects—There were 603 adults, aged 18 years and older, who were predominantly Black, Latino and female.

Intervention—Thirty cohorts of walking-groups met 3 times per week for 32 weeks.

Measures—Participation and physical activity (piezo-electric pedometer) were measured at each walking session. Perceived safety on the route (questionnaire), perceived neighborhood safety (questionnaire), and waist circumference were measured at baseline, 8 weeks, and 32 weeks.

Analysis—Analysis of generalized models with generalized estimation equations.

Results—Retention was 90% at 8 weeks, and 64% at 32 weeks. Perceived safety on the route, but not perceived neighborhood safety, dampened participation at 8 but not 32 weeks. Consistent participation in the intervention increased physical activity, and reduced central adiposity irrespective of perceived safety on the walking route or perceived neighborhood safety.

Conclusion—Efforts to improve safety in conjunction with interventions focused on increasing physical activity can work towards improving physical activity for Blacks and Latinos, leading to a myriad of improved health outcomes including reduced central adiposity

Introduction

Insufficient levels of physical activity are associated with multiple health risks, including hypertension, cholesterol, blood glucose, and obesity.¹ Although research has demonstrated

that physical activity is beneficial to health, 32% of U.S. adults do not meet the recommended guidelines for leisure-time physical activity,² with lower levels among those with lower socioeconomic status (SES), Non-Latino Blacks (NLBs) and Latinos.³ NLBs and Latinos are more likely to report challenges to physical activity, such as safety concerns, when engaging in leisure-time physical activity.⁴ Walking-group interventions have been shown to be efficacious in increasing physical activity levels by providing social support for behavior change,^{5,6} and potentially increasing a sense of safety among walkers. Although studies of the effectiveness of physical activity interventions among NLBs and Latinos have examined the extent to which perceptions of safety modify the effectiveness of physical activity intervention, to our knowledge, only one of these interventions examined individuals walking in groups.

A handful of studies have found that behavior change interventions to promote physical activity are less effective in less supportive environments,^{7–12} although the evidence is mixed. For example, Kerr and colleagues evaluated both objective and subjective measures of walkability to examine whether a walking intervention was equally effective in neighborhoods that were more and less walkable.⁷ They reported that objective measures of walkability (i.e., residential density, land use mix, and street connectivity) moderated the relationship between a three component intervention that included an interactive computer program, web-based activities, and tip sheets to increase physical activity in overweight men. Perhaps counter-intuitively, men living in less walkable neighborhoods benefitted more from the intervention than those who lived in more walkable neighborhoods.⁷ In contrast, the intervention was more effective for overweight women who perceived their neighborhood to be safer from traffic.⁷ This latter finding is consistent with results reported by King and colleagues who found that traffic safety moderated effectiveness of a physical activity intervention among African American women.⁸ Sallis and colleagues also report positive associations between safer neighborhood conditions and physical activity.^{8,9} Two studies examining potential modifying effects of neighborhood safety on the effectiveness of a walking intervention exclusively among African American women reported no significant effect modification by perceptions of crime or environmental safety.^{10,11} The one study that examined individuals walking in groups was an intervention by Wilson and colleagues. This environmental intervention to increase walking in an African American community, randomized three groups that received a police-patrolled plus social marketing campaign, police patrolled walking-only, and a no-walking intervention.¹² The walking attendance increased in the community that received police-patrolled plus social marketing, whereas the two communities that received police-patrol only, or walking alone, did not show an increase in walking attendance.¹² Taken together, these findings offer mixed evidence regarding the extent to which the effectiveness of physical activity interventions may be modified by neighborhood safety. Given that almost all of these studies were individual (rather than group) interventions, and used self-reported measures of physical activity, important questions remain about the extent to which perceived neighborhood safety may influence physical activity among individuals walking in groups. While walking in groups has been identified as one approach to addressing some safety concerns (e.g. through safety in numbers), only one of the studies examined above assessed the extent to which safety modified the effectiveness of interventions designed to promote walking in groups.

Additional research is needed to examine whether participants' perceptions of safety modify the effectiveness of an intervention designed to promote walking in groups.

Conceptual Framework

We conceptualized three pathways through which perceived safety might modify the effectiveness of a walking group intervention (Figure 1). First, individuals who perceive the walking route or their neighborhood as less safe may have lower rates of participation, for example, being less likely to attend on a regular basis, or terminating participation due to perceptions that the routes are unsafe. Second, individuals who perceive the walking route or their neighborhoods as less safe may walk shorter distances compared to those who perceive greater safety, reducing the impact of the intervention on the number of steps walked. Third, perceived safety may modify associations between physical activity and central adiposity. While physical activity has several positive benefits on central adiposity, including reductions in abdominal fat, and increased metabolism and decreased hormones that contribute to fat deposition,¹³ stress may decrease the body's metabolism and increase hormone levels that increase fat deposition in the abdominal area, thus contributing to increased risk of central adiposity.¹⁴ Thus, perceived safety may be associated with stress, and with those perceiving lower levels of safety experiencing heightened stress. Therefore, we examine whether perceived safety modifies the association between increased physical activity and reduced waist circumference, with those reporting lower levels of perceived safety realizing fewer benefits of physical activity on central adiposity.

Hypotheses

To examine the conceptual pathways described above, we tested three hypotheses: 1) perceived safety will be positively associated with walking group participation, measured as consistency of participation over time (pathway 1); 2) perceived safety will modify positive associations between walking group participation and increases in steps over time, such that those reporting lower perceived safety will take fewer steps (not walk as far) compared to those who perceive greater safety (pathway 2); and 3) perceived safety will modify associations between steps and central adiposity, such that participants who perceive lower levels of safety will experience a dampening of positive effects of walking on central adiposity (pathway 3).

Methodology

Sample

Description of the intervention and study design

Overview: *Walk Your Heart to Health (WYHH)* is a walking group intervention designed and implemented by the Healthy Environments Partnership (www.hepdetroit.org), using a community-based participatory research partnership approach that engaged community residents, community-based organizations, health service providers and academic researchers. Following a three-year community planning process and pilot intervention,¹⁵ HEP conducted a multi-year test of *WYHH* intervention effectiveness.¹⁶ The intervention design was informed by a social-ecological model that suggests that individual behaviors

and risks occur within the context of organizational, community and policy environments.¹⁷ The design incorporated attention to risk and protective factors for heart health across multiple levels of the social-ecological model in order to address barriers and strengthen facilitating factors for physical activity that were identified in the planning process.¹⁸ For example, HEP worked with community members to map safe routes for groups to walk in their neighborhoods and identified community locations where community members could walk indoors during poor weather conditions.¹⁸ Approval for research on human subjects was granted by the University of Michigan Institutional Review Board on January 31, 2008. The [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT02036593) identifier is NCT02036593.

WYHH Intervention Design: We provide a brief overview of the intervention and study design, which are described in greater detail elsewhere.⁶ Detroit residents aged 18 were eligible to participate in WYHH following completion of a modified version of the Physical Activity Readiness Questionnaire.¹⁹ Following completion of informed consent, participants completed a baseline Health Risk Assessment (HRA) including a questionnaire and collection of anthropometric and clinical indicators of CVR (e.g., blood pressure, lipid panel). Each participant wore a pedometer with the step-counter blinded for one week prior to the start of the intervention to provide baseline steps data.

WYHH was evaluated using a cluster randomized controlled design with a lagged intervention group. There were 30 cohorts of walking-groups, with an average of 15 participants each, hosted by 11 host sites (community-based organizations and faith-based organizations) in Detroit. Altogether, 603 participants were followed over 32 weeks, with data collection at baseline, 8 and 32 weeks. Results reported elsewhere demonstrated positive associations between participation and increases in steps over time, and between steps and cardiovascular health indicators (e.g., systolic blood pressure, fasting blood glucose, and waist circumference).⁶

Measures

There were five *dependent variables* used in this analysis. These were *consistent participation* (i.e., the number of weeks participants attended at least one walking group session); three measures of *physical activity* (i.e., mean steps per day on days when walking in group, mean steps per day on all days, and mean steps per day when walking without the group); and *waist circumference* (i.e. a continuous measure of waist circumference in centimeters) as a proxy for central adiposity. The *independent variables* were two measures of *perceived safety*: perceived safety on the walking routes (i.e. “I feel safe walking on the routes”), with response options ranging from strongly agree (5) to strongly disagree (1); and perceived neighborhood safety (i.e. “When you do walk in your neighborhood, how safe do you feel”). Two dichotomous measures of safety were created by splitting the measure at the median, with strongly agree = 1, and somewhat agree, neutral, or somewhat and strongly disagree = 0. Sensitivity analyses were conducted using ordinal and dichotomous measures of safety. A continuous measure of *consistent participation (range 1 to 32 weeks)* was created into quartiles, with quartile 1= 1-13 weeks, quartile 2= 14-21 weeks; quartile 3= 22-29 weeks, and quartile 4= 30-32 weeks. *Demographic control variables* consisted of age (years); self-reported race/ethnicity, and time (baseline, 8 weeks, or 32 weeks).

Analysis

We used generalized linear models (GLM) with the generalized estimation equations (GEE)²⁰ approach to test the hypotheses described above. Advantages of a GEE model include that it controls for repeated measures within an individual, and permits calculation of robust estimates for the standard errors of the regression coefficients.²¹ In this analysis, we used GEE to account for the clustering of observations of the same individual over time. Participants missing key indicators (n=41), those who enrolled but did not attend any sessions (n=22), and those with non-concordant data (n= 66) were excluded from the analyses. The final sample included 474 participants. The demographic characteristics of the 474 participants were similar to the full sample (n= 603).

Model 1 tested the hypothesis that perceived safety is associated with participation, above and beyond age and race. To test this hypothesis, we regressed participation on perceived safety, using the following model:

$$\text{Model 1: PARTICIPATION} = \beta_0 + \beta_1 \text{AGE} + \beta_2 \text{OTHER} + \beta_3 \text{LATINO} + \beta_4 \text{TIME} + \beta_5 \text{PERCEIVED SAFETY} + \beta_6 \text{TIME} \\ * \text{PERCEIVED SAFETY} + e$$

The coefficient of interest is β_6 , indicating the extent to which associations between time and participation are modified by perceptions of neighborhood safety or safety along the walking route.

To test our second hypothesis, we regressed physical activity on an interaction between participation and perceived safety.

$$\text{Model 2: PHYSICAL ACTIVITY} = \delta_0 + \delta_1 \text{AGE} + \delta_2 \text{OTHER} + \delta_3 \text{LATINO} + \delta_4 \text{PARTICIPATION} + \delta_5 \text{PERCEIVED SAFETY} + \delta_6 \text{PARTICIPATION} \\ * \text{PERCEIVED SAFETY} + e$$

The coefficient of interest is δ_6 , indicating the extent to which associations between participation and physical activity are modified by perceptions of safety in the residential neighborhood or along the walking routes.

To test our final hypothesis, we used waist circumference as the dependent variable and regressed it on an interaction between physical activity and perceived safety, to test whether perceived safety modified the association between physical activity and waist circumference (Model 3).

$$\text{Model 3: WAIST CIRCUMFERENCE} = \gamma_0 + \gamma_1 \text{AGE} + \gamma_2 \text{OTHER} + \gamma_3 \text{LATINO} + \gamma_4 \text{PERCEIVED SAFETY} + \gamma_5 \text{PHYSICAL ACTIVITY} + \gamma_6 \text{PHYSICAL} \\ \text{ACTIVITY} * \text{PERCEIVED SAFETY} + e$$

The coefficient of interest in this model is γ_6 , indicating whether associations between physical activity and waist circumference are modified by perceptions of safety.

Results

Table 1 describes the participant characteristics at baseline, 8 weeks, and 32 weeks. At baseline the mean age was 47.4 years (s.d. 13.8); 59.3% Non-Latino Black, 36.7% Latino, and 4.0% other.

Does perceived safety modify associations between time and participation?

Table 2 shows results from models testing the first hypothesis, whether perceived safety in the neighborhood (Model 3) modify associations between time and consistency of participation in the intervention. Model 1 is the baseline model. Model 2 reports the main effect of perceived neighborhood safety on consistent participation (est= -0.4, p= 0.26). Model 3 includes the interaction between time and safety, with results showing no support for the hypothesis that perceived neighborhood safety modifies participation at 8 weeks (est = -0.11, p= 0.64) or at 32 weeks (est = 0.33, p= 0.79). Results were similar for models examining perceived safety on the walking route (results not shown).

Does perceived safety modify the relationship between participation and physical activity?

Table 3 shows results for the second research question, whether perceived safety modifies the relationship between consistent participation and the number of steps taken. Models 1 and 2 report the baseline and main effect models. Model 3 reports the interaction. We do not find a significant effect modification of perceived neighborhood safety on the association between participation and the number of steps taken overall (Quartile 2: est= -25.6, p= 0.94; Quartile 3: est= -494.5, p= 0.13; Quartile 4: est= 466.5, p= 0.43) (Table 3, Model 3). Results were similar for models examining perceived safety on the walking route (results not shown).

Does perceived safety modify the relationship between physical activity and waist circumference?

Table 4 shows results for the last research question, whether perceived neighborhood safety modifies the relationship between physical activity and waist circumference. Models 1 and 2 show baseline and main effects, respectively. Results reported in Model 3 find no significant effect modification of perceived neighborhood safety on associations between steps and waist circumference (est< 0.0, p= 0.77). Similar models examining effect of perceived safety along the walking groups find no evidence for effect modification of associations between steps and waist circumference (est< 0.0, p= 0.40) (results not shown).

Discussion

There are three main findings of this study. The first is that after controlling for age, race, and time, perceived safety on the walking route, but not perceived neighborhood safety, dampened participation in the walking group intervention at 8 weeks. There were no effects of either measure at 32 weeks from baseline. The second is that the positive effect of participation in the WYHH intervention and physical activity was not modified by either perceived safety on the walking route or perceived neighborhood safety. Third, we found that the reduction in central adiposity (i.e. waist circumference) associated with increased

physical activity was not modified by perceived safety on the walking route or perceived neighborhood safety.

Our finding that perceived safety on the route was associated with participation in the WYHH physical activity intervention at eight weeks contributes to a small existing literature on this topic with mixed findings.^{10–12} Zenk and colleagues,¹¹ examined whether adherence to a home-based walking intervention among African American women differed by several indicators of the neighborhood environment (walkability, aesthetics, availability of outdoor and indoor facilities, and safety). They found that except for the availability of indoor facilities, other environmental measures had no effect on greater adherence to the intervention. Similarly Oh and colleagues,¹⁰ examined whether adherence to a home-based walking intervention among African American women differed by perceived and objective indicators of crime and found no significant effects. While our finding was in the opposite direction from that expected – that is, we found that those who perceived the walking routes as more safe attended 0.4 weeks less than those who perceived the walking routes as more safe at 8 weeks – this effect was small and was not visible at 32 weeks. Wilson and colleagues randomized three communities to an environmental intervention to increase walking in African American communities that received social marketing and police-patrol increased walking attendance, and found that walking attendance increased in the community that received police-patrolling plus social marketing.¹² Taken together with findings reported by others, these results suggest that there may be differences in patterns of associations of safety indicators depending on the specific indicator of safety assessed. While the indicators of safety used in this study disentangled location (neighborhood, walking route) they do not allow us to disentangle different dimensions or forms of safety (e.g., traffic, crime). The study of more specific indicators of safety may help to further disentangle contradictory findings on safety and physical activity currently reported in the literature.^{6–8,10–12}

We did not find evidence to support the hypothesis that positive associations between participation and physical activity were modified by perceived safety on the walking routes or in the participant's neighborhood. Previous studies have suggested that lower levels of perceived safety may weaken the impact of individually-based physical activity interventions on increases in physical activity.^{7–9} In contrast, the results reported here are among the first to examine this association in a walking group intervention, and find no evidence of an effect of perceived safety on intervention effectiveness. This null finding is consistent with a study by Izumi and colleagues that found that walking in groups may help to mitigate some of the adverse effects of perceived safety that individuals experience when walking alone.²²

Similarly, we did not find evidence to support the hypothesis that the beneficial effects of walking on waist circumference were modified by perceived safety in this study. This is the first study of which we are aware to assess this relationship. The positive effects of physical activity on waist circumference were not lessened among those reporting less safe neighborhood or walking route conditions. Depending on the dimension of safety (e.g., traffic, crime) there may be other adverse effects not assessed by this study (e.g., increased

risk of pedestrian-vehicle accidents, criminal victimization) that should be considered and addressed in order to promote walking in a safe environment.

Limitations and Strengths

Limitations and Implications for Future Research

There are some limitations to this study. The first is that the two safety measures used were general measures that did not allow us to assess which specific forms of safety (e.g. safety from traffic, safety from crime) participants were reporting on. Future studies should aim to distinguish specific forms of safety, for example, crime reports, traffic volume or speed, and their effects on physical activity interventions. This would enable public health researchers to focus efforts on specific aspects of safety that may be a barrier to physical activity, such as improving access to traffic-calming devices or indoor recreational facilities. Second, this study included perceived but not observed indicators that may have influenced safety, such as traffic volume or speed, or indicators of walkability. The inclusion of observed as well as perceived indicators associated with walking safety would strengthen future studies and, as above, provide useful information about modifiable neighborhood conditions that might be associated with physical activity.

Our attempt to assess effect modifications of perceived safety, as an indicator of stress, on associations between physical activity and waist circumference, also had limitations. It is likely that walking group participants experienced exposures to psychosocial stress beyond that reflected in our indicators of perceived safety (e.g., stressful life conditions associated with economic conditions, health concerns, family dynamics, discrimination). Thus our indicator was limited in its ability to adequately capture participants' exposure to stressful life conditions. Furthermore, the relatively short duration of the *Walk Your Heart to Health* intervention (32 weeks), may have been too brief to demonstrate modification of the positive physiological effects of walking on waist circumference. Future studies that examine a more complete array of psychosocial stress, over longer durations may be more suitable to draw conclusions on the extent to which perceived safety and other psychosocial stress indicators may modify the effect of physical activity on central adiposity.

Strengths—Despite these limitations, this study had a number of strengths. These included an objective measure of physical activity (i.e. piezo-electric pedometer data), a modest sample size with repeated measures, and a cluster randomized design that offered good internal validity.

Conclusion

Several public health implications can be taken from these findings. First, programs that support walking in groups may be beneficial to individuals who feel less safe walking alone. Such interventions have been demonstrated to increase physical activity and reduce multiple indicators of cardiovascular risk, including but not limited to central adiposity. Results reported here suggest that perceptions of safety, which have been previously reported to influence the effectiveness of walking group interventions that focus on walking alone, did not substantially modify the effectiveness of this group level intervention. Thus, walking

group interventions may be particularly effective in promoting physical activity among residents of urban neighborhoods that experience challenges related to safety, such as those in which the WYHH intervention was conducted. However, walking group interventions should not replace the need for investments that assure safety in urban neighborhoods. There are many dimensions of safety that can affect walking, including the physical condition of the neighborhood (e.g., disorder), social conditions (e.g., crime, violence), and physical infrastructure (e.g., presence or condition of sidewalks, traffic volume and safety). Understanding the specific domains of safety that are in play in any given neighborhood, and analyzing their implications for the safety of walkers is critical. Resources that improve economic and educational opportunities can revitalize communities and reduce violence and physical disorder, and improve access to safe areas that are conducive to physical activity. Investments that reduce the volume and speed of traffic in residential areas, and that provide safe options for pedestrians in areas where there is greater volume and speed of traffic are essential to protect the safety of walkers, whether walking alone or in groups. Such efforts to improve safety in conjunction with interventions focused on increasing physical activity can work towards improving physical activity for NLBs and Latinos which can lead a myriad of improved health outcomes including reduced central adiposity and improved cardiovascular health.

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Figure 1.
Conceptual Model of Perceived Safety on Intervention

Table 1

Characteristics of WYHH Study Participants at Baseline, 8, and 32 weeks

Full Sample Baseline (n=474)												8 Weeks (n=414)			32 Weeks (n=280)		
Demographics		N	%	Mean (SD)	Min-Max	N	%	Mean (SD)	Min-Max	N	%	Mean (SD)	Min-Max				
Age in years		474		47.4 (13.8)	19.6-89.7	414		48.7 (13.9)	19.9-89.4	280		49.7 (13.9)	20.4-86.8				
Race/ Ethnicity																	
Latino		174	36.7			144	34.8			96	34.3						
Non-Latino Black		281	59.3			252	60.9			173	61.8						
Other		19	4.0			18	4.4			11	3.9						
Perceived Safety																	
Route		380		0.5 (0.5)	0-1.0	406		0.6 (0.50) *	0-1	279		0.6 (0.49) *	0-1				
Neighborhood		397		0.7 (0.5)	0-1.0	358		0.7 (0.44)	0-1	243		0.7 (0.44)	0-1				
Participation (Weeks)																	
Participation		474		1.0 (0.0)	0-1.0	414		6.7 (1.86) *	1-8	280		20.0 (9.2) *	1-32				
Q1		474	100	1.0 (0.0)	1-1.0	86	20.8			68	26.6						
Q2						111	26.8			73	28.5						
Q3						217	52.4			90	35.2						
Q4										49	19.1						
Steps per day																	
Steps with Group		430		4443.2 (2678.1)	20.0-20753.4	411		9523.9 (3297.6) *	591.0-21324.6	277		9708.9 (3493.5) *	1560-24215.8				
Steps Alone		430		4443.2 (2678.1)	20.0-20753.4	413		5618.4 (2646.6) *	269.7-15718.6	280		5484.70 (2766.8) *	260-19319.7				
Total Steps		430		4443.2 (2678.1)	20.0-20753.4	413		6811.7 (2766.2) *	269.7-16502.7	280		6560.9 (2931.0) *	260-20751.6				
Health Outcome																	
Waist(cm)		468		102.5 (15.8)	64.0-150.0	405		100.7 (15.6) *	66.0-151.0	272		98.6 (16.0) *	65.0-147.5				

* Indicates significantly different from baseline (p = 0.05)

Table 2

Participation (Number of Sessions and Consistency) Regressed on Time at Baseline, 8, and 32 weeks, Perceived Neighborhood Safety at Baseline, Intervention Period, and Maintenance Period, and the Interaction between Time and Perceived Neighborhood Safety, Controlling for Age and Race.

Parameters	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
Intercept	0.9	0.1	1.2	0.4	1.3	0.3
Age	0.1**	0.0	0.1	0.0	0.1	0.0
Latino	0.2	0.3	0.1	0.4	0.1	0.4
Other	-0.5	0.8	-0.6	0.9	-0.6	0.9
Time(8 weeks)	5.6	0.1	5.6***	0.1	5.7***	0.2
Time(32 weeks)	18.9	0.5	19.1***	0.6	18.8***	1.0
Perceived Neighborhood Safety			-0.4	0.4	-0.5*	0.2
Time(8 weeks) * Perceived Neighborhood Safety					-0.1	0.2
Time(32 weeks) * Perceived Neighborhood Safety					0.3	1.2
QIC	1176.5		1007.5		1011.1	

* p 0.05;

** p 0.01;

*** p 0.001

Table 3

Physical Activity (Total Mean Steps Per Day) Regressed on Perceived Neighborhood Safety, Participation, and Interaction Between Participation and Perceived Neighborhood Safety, Controlling for Age and Race

Parameters	Model 1		Model 2		Model 3	
	β	SE	β	SE	B	SE
Intercept	4169.4	147.6	3855.9	232.3	3773.4	249.2
Age	-17.5 *	8.6	-17.8 *	8.8	-17.7 *	8.8
Latino	668.6 **	240.5	877.7 ***	266.4	874.4 ***	267.1
Other	384.1	836.9	-258.7	549.8	-274.4	549.0
Time (8 weeks)	1582.8 ***	174.1	1637.5 ***	186.6	1636.7 ***	187.4
Time (32 weeks)	1111.7 ***	180.3	1157.6 ***	196.7	1143.0 ***	197.2
Participation (weeks)						
Q2	771.9 ***	178.6	782.3 ***	198.2	809.6 **	269.4
Q3	1295.7 ***	203.8	1289.3 ***	217.1	1649.2 ***	333.4
Q4	2026.5 ***	396.2	2137.4 ***	449.2	1732.7 ***	389.4
Perceived Neighborhood Safety			294.7	199.3	417.1	237.6
Q2 * Perceived Neighborhood Safety					-25.6	311.8
Q3 * Perceived Neighborhood Safety					-494.5	323.7
Q4 * Perceived Neighborhood Safety					466.5	596.6
QIC	1114.0		956.3		955.5	

Note: Q2, Q3, and Q4 are quartiles; SE= Standard Error

* p 0.05;

** p 0.01;

*** p 0.001

Table 4

Waist Circumference Regressed on Physical activity (total mean steps), Perceived Neighborhood Safety, and the Interaction between Physical Activity and Perceived Neighborhood Safety

Parameter	Model 1		Model 2		Model 3	
	β	SE	B	SE	β	SE
Intercept	107.1	1.2	107.0	1.4	107.2	1.6
Age	-0.1	0.1	-0.1	0.1	-0.1	0.1
Latino	-5.5***	1.7	-5.6***	1.8	-5.6***	1.8
Other	3.2	3.0	2.4	3.0	2.4	3.0
Time (8 weeks)	-0.5	0.4	-0.3	0.5	-0.3	0.5
Time (32 weeks)	-1.4**	0.6	-1.5*	0.6	-1.5*	0.6
Physical Activity	-0.6***	0.1	-0.6***	0.1	-0.7***	0.2
Perceived Neighborhood Safety			0.6	0.7	0.3	1.4
Physical Activity * Perceived Neighborhood Safety					0.0	0.0
QIC	1111.5		957.3		956.8	

Note: SE= Standard Error

*-Coefficient and standard error multiplied by 1000

* p 0.05;

** p 0.01;

*** p 0.001