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Associations between eating occasions and places of consumption among adults

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Abstract

The objective of this study was to determine whether places of consumption are associated with types of eating occasions. Data on dietary behaviors of 226 adults in five U.S. cities were collected in food diaries for one week. Types of eating occasions and places of consumption were recorded. Eating occasions were defined as occurrences of meal, snack, beverage, and non-fruit dessert consumption. Nearly one-third of eating occasions occurred at non-designated eating places. Repeated measure generalized linear models were used to assess the associations between types of eating occasions and places where food was consumed. Snacking on low-nutrient foods were more likely to occur in non-designated eating places. Snacking was more likely at work than at home, and sugar sweetened beverage consumption was more likely at food service outlets than at home. The finding that places of consumption were associated with different types of eating occasions suggests that contextual characteristics of a place are important in individual eating behaviors. Policies and programs aiming to promote healthy eating should leverage contextual characteristics of eating environments.

Keywords

Diet; Eating environment; Context effect; Food diary; Snack

Introduction

Diet and nutrition are important contributors to population health and chronic disease risk (Healthy People 2020; National Prevention Strategy, 2011). Trends in dietary patterns over the last few decades include increased food consumption away from home, at fast food outlets, and of sugar sweetened beverages (Briefel & Johnson, 2004; French, Story, & Jeffery, 2001; Ma et al., 2003). In addition, snacking has increased in prevalence and

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consumption of high-sugar, high-fat content snack items are associated with obesity (Berteus Forslund, Torgerson, Sjostrom, & Lindroos, 2005; Piernas & Popkin, 2010). Analyses of National Health and Nutrition Examination Surveys (NHANES) have attributed increased total energy intake to changes in energy density, portion size, and the number of eating occasions, where an eating occasion was defined as a meal or snacks/beverages consumed within 15 minutes (Duffey & Popkin, 2011). Although there is evidence of changing dietary content and food away from home, the setting where people eat and how the contextual factors of the setting are related to what people eat are not as well-characterized.

Eating behavior involves a myriad of complex influences. Social cognitive theory suggests that behavior is reciprocally influenced by cognition and environment (Glanz & Bishop, 2010). Under this theory, self-efficacy is important for an individual to change behavior; however, individuals also respond to environmental changes. In this vein, studies have examined diet as an automatic or habitual behavior, whether conscious or not, that can be influenced by contextual factors such as within-place food accessibility, food labelling, atmosphere, and social situations (Cohen & Farley, 2008; Khare & Inman, 2006). Wansink describes such factors of an eating environment as atmospherics, effort, eating with others, and distractions (Wansink, 2004). The physical environment includes atmospherics such as light, temperature, sound, and smell. Effort refers to the accessibility and convenience of food, which is also part of the physical surroundings. For example, the placement of chocolate on one's desk versus two meters away can result in increased consumption (Painter, Wansink, & Hieggelke, 2002). Eating in the presence of others can lengthen the duration of eating and socialization can provide cues to eat more or less than one might have if eating alone (Clendenen, Herman, & Polivy, 1994; de Castro, 1994; Redd & de Castro, 1992). Last, numerous studies have demonstrated that distractions can greatly limit people's cognitive ability to consciously respond to stimuli, which can lead to impulsive or mindless eating (Stroebele & De Castro, 2004). One often cited example is the Shiv and Fedorikhin experiment in which participants who were asked to memorize a seven-digit number rather than a two-digit number were more likely to select a snack of chocolate cake rather than fruit salad (Shiv & Fedorikhin, 1999). Thus, both the physical and social environment can influence the type and amount of food consumed. The place of consumption, whether it is a cafeteria, restaurant, workspace, dining table, or couch in the living room, the availability and accessibility food at that place, and other contextual factors could affect the type and amount of food that ends up being consumed (Cohen & Babey, 2012). The effect of environmental factors such as social facilitation has been characterized in many studies, while some other factors have been examined only in laboratory settings or within limited observational studies (Stroebele & De Castro, 2004). Further insight into the influence of the home or work environment on adult eating behaviors can inform healthy eating interventions.

This study aims to assess where people eat, and whether the setting is related to consumption and the type of food consumed. We examined whether the designation of a place as primarily intended for eating or not intended for eating is associated with more frequent eating occasions and unhealthy food. Food consumption at a non-designated eating place may be a proxy for eating when constrained for time or eating as a secondary

behavior, e.g., snacking in front of the television or at a workspace. We hypothesize that eating under such conditions may be related to unhealthy food consumption.

Methods

Study sample

The data were collected as part of a study of neighborhood parks in which 241 individuals were recruited primarily from neighborhood parks in five U.S. cities between May 2009 and April 2011 (Evenson, Wen, Hillier, & Cohen, 2013). The participants were a non-random sample from Los Angeles, California (CA); Chapel Hill, North Carolina (NC); Columbus, Ohio (OH); Philadelphia, Pennsylvania (PA); and Albuquerque, New Mexico (NM). Further details regarding participant recruitment and data collection are published elsewhere (Evenson, Wen, Golinelli, Rodriguez, & Cohen, 2013; Evenson, Wen, Hillier, et al., 2013). Briefly, participants were weighed on a digital scale and heights were measured with a stadiometer at recruitment. Participants wore ActiGraph accelerometers (GTIM) and GPS monitors (Qstar BT-Q1000X) that measured physical activity and location data in one-minute intervals for three weeks. For the last week of the study, participants recorded all places visited and the types of food consumed there, using a travel and food diary log on a personal digital assistant (PDA). Of the 241 participants recruited, 15 were not analyzed in the present study due to missing data. Thus, the analysis sample here consists of 226 participants.

Food diary

The PDA responses in the diary were guided by a series of questions accompanied by a list of responses from which the participant could choose. The first set of questions asked the participant to record the time arrived, type of place, and transportation mode. The types of place included home, work, sit-down restaurant, fast food/convenience store, grocery/supermarket, mall/store, someone else's home, park, place of worship, community activity facility, and other. The transportation modes included walk, bike, car, and mass transit. Questions that included "other" as a response gave the participant the option to write in a response.

The next set of questions was on the consumption of meals, non-fruit desserts, snacks, and beverages. Meals were recorded as check-box selections of breakfast, lunch, dinner, and other. Participants indicated whether they had a non-fruit dessert with the meal. Check-box selections for snacks were candy, cookies and pastries, chips or other salty snack, fruit, vegetables, frozen dessert, dairy products like yogurt, deep fried food, other, and none. Check-box selections for beverages were coffee or tea, sugar sweetened beverage, diet drink, 100% juice drink, milk/soy milk/yogurt drink, alcohol, water, other, and none.

Last, participants were asked to describe whether the eating place they ate or drank at was a designated eating place, non-eating place, or in transit. Participants were instructed to consider designated eating places as places primarily meant for eating, such as dining areas, and non-eating places as places not primarily designated for eating, such as a desk at work

or a living room. Training and verbal explanations were provided to participants prior to the diary period.

Definition of eating occasions

In this paper, an eating occasion was defined as an instance of a meal, snack, beverage, or non-fruit dessert recorded in the food diary. Only non-fruit dessert occasions that did not coincide with a meal were counted as an additional eating occasion in the total number of eating occasions. Snacks were classified as healthy, unhealthy, and other snack occasions. Healthy snacks included fruit, vegetables, and dairy products like yogurt. Unhealthy snacks included candy, cookies or pastries, chips or other salty snack, frozen dessert, and deep fried food. Written responses under the “other” option for snacks were categorized as healthy, unhealthy, and other snacks by the authors based on the similarity of written description with the aforementioned snack items. Snack items per diary entry were grouped into occasions of healthy, unhealthy, or other snack consumption. For example, if a participant had both fruit and vegetables in one diary entry, this would count as one eating occasion of a healthy snack. If a participant had fruit and cookies in one diary entry, this would count as two eating occasions – one healthy snacking and one unhealthy snacking occasion. All beverages except for water were counted as eating occasions. As each diary entry reflected a trip to a single destination, multiple eating occasions may have occurred with each entry.

Accelerometer

Participants were instructed to wear the accelerometer and GPS devices starting in the morning when they woke up and to remove it when they went to sleep. The accelerometer counts were previously pre-processed to exclude unreliable measurements (Evenson, Wen, Hillier, et al., 2013). Periods of at least 20 minutes when the accelerometer recorded zeros were considered non-wear time. Accelerometer counts during non-wear time were set to missing. Additional data processing was performed in R version 2.15.1 (R Foundation for Statistical Computing, Vienna, Austria) to remove duplicated records. In this paper, time spent in moderate to vigorous physical activity (MVPA) is described as the average minutes per day above 2020 counts/minute, based on the intensity thresholds used by Troiano and colleagues (Troiano et al., 2008). Average MVPA for each participant was calculated by summing the total number of minutes above 2020 counts/minute and dividing by the total wear time expressed as days and fractions thereof. Wear time was defined as the total time with valid accelerometer and GPS data.

Statistical analysis

Descriptive statistics were calculated to summarize the eating occasions by type and place of consumption. Generalized linear models were used to estimate associations between eating occasions and the places of consumption. To account for the strong intraclass correlations within each subject due to repeated measures, the generalized estimating equation (GEE) method was applied to fit the models. The four dichotomous outcome variables in the models are the consumption of healthy snack, unhealthy snack, sugar sweetened beverage, and non-fruit dessert. Consumption of each type was defined as at least one eating occasion of that type in a diary entry. The four outcome variables were modeled separately. Each model contained the same set of independent variables in the multiple logistic regressions.

The main study factors are the type of place, which consists of sit-down restaurant, fast food/convenience store, work, home, and all remaining types of place aggregated as other places, and the type of eating place, which consists of designated eating place, non-eating place, and in transit. All four models were also adjusted for the following person-level covariates: age (continuous), sex, ethnicity, education, BMI (continuous), average MVPA minutes per day (continuous), and city. Cities were controlled as fixed effects to account for any unobservable differences across geographic locations. All statistical analyses were conducted in R.

Results

Participant characteristics

Descriptive statistics of age, sex, ethnicity, education, BMI, and MVPA for the 226 participants from the five sites are shown in Table 1. The sample is 55% female, and 50% non-Hispanic white, 26% non-Hispanic black, and 15% Hispanic. Participants had a range of education levels. The mean age is 40 years (standard deviation [SD] 16, range 18–85), and the mean BMI is 28.3 kg/m^2 (SD 7.1, range 18.1–59.5). Average daily MVPA based on the 2020 counts/minute threshold was 26 minutes per day (SD 20, range 0.3–158).

Food diary measures

The 226 participants completed 6,976 diary entries containing 10,855 eating occasions. The eating occasions are summarized in Table 2. On average, participants recorded 6.5 eating occasions per day. Meals constituted 2.5 of those daily eating occasions. An average of 1.7 snacking occasions per day was reported, of which nearly half were unhealthy snacking occasions. Of the average 2.2 beverage occasions per day, 18% were of sugar sweetened beverages. Approximately 24% of reported non-fruit dessert consumption occurred without a meal and were considered an additional eating occasion. Approximately 28% of eating occasions occurred in non-eating places and about 5% took place in transit. Participants reported eating away from home an average of 5.8 times per week, of which sit-down restaurants and fast food/convenience stores accounted for an average of 2.9 and 2.1 times per week, respectively.

The five most common types of place of consumption were home, work, someone else's home, sit-down restaurant, and fast food/convenience store (Table 3). All types of eating occasions most frequently occurred at home, with an average of 27.3 times per week recorded in the diaries. The second most common type of place for all eating occasions was work, with an average of 5.4 times per week (including participants who may not work outside the home).

Factors associated with eating occasions

The estimated associations between eating occasion outcomes and the place of consumption are shown in Table 4. The eating place and type of place had differential associations with eating occasions after controlling for demographic characteristics, BMI, and physical activity level. Non-eating places were associated with 1.3 times greater odds of consuming an unhealthy snack compared to designated eating places (95% CI=1.1, 1.7; $p<0.05$). In

transit consumption of a healthy snack, unhealthy snack, sugar sweetening beverage, or non-fruit dessert was not significantly different from consumption at a designated eating place. Eating at sit-down restaurants was associated with 0.3 times lower odds of eating healthy snacks compared to eating at home (95% CI=0.2, 0.5; $p<0.001$). Compared to eating at home, the odds of drinking a sugar sweetened beverage was 1.7-fold greater at a sit-down restaurant (95% CI=1.0, 2.9; $p<0.05$) and 3.3-fold greater at a fast food/convenience store (95% CI=2.2, 5.1; $p<0.001$). Eating at work was associated with approximately 1.5 times greater odds of snacking, whether healthy or unhealthy, compared to eating at home (95% CI=1.1, 2.0; $p<0.05$). The odds of unhealthy snack consumption was also 1.5 times greater at other places compared to home (95% CI=1.2, 1.8; $p<0.01$).

Heterogeneous effects by demographic characteristics and BMI were observed after controlling for the other covariates in the model. Compared to men, women had 1.5 and 1.7 times greater odds of having a healthy snack (95% CI=1.1, 2.2; $p<0.05$) and non-fruit dessert (95% CI=1.2, 2.3; $p<0.01$), respectively. The odds of having a non-fruit dessert was 1.9 times greater for Hispanics compared to whites (95% CI=1.2, 3.0; $p<0.05$). The odds of consuming a healthy snack was 1.7 times greater for individuals of other race/ethnicities compared to whites (95% CI=1.1, 2.8; $p<0.05$). Blacks did not show significant differences from whites. Compared to college educated individuals, the odds of consuming a sugar sweetened beverage was 3.1 times greater for those with high school education/GED or less (95% CI=1.6,6.1; $p<0.001$). The odds of consuming an unhealthy snack was 1.6 times greater for individuals with some college or vocational school (95% CI=1.2, 2.3; $p<0.01$) compared to individuals who had completed college. Incrementally, for every 4 kg/m^2 higher BMI (about 25 pounds for a 5’5” individual), the odds of having a healthy snack was 13% lower (95% CI=0.7, 1.0; $p<0.05$) and the odds of having a sugar sweetened beverage was 20% greater (95% CI=1.0, 1.4; $p<0.05$). Average daily MVPA and city were not significantly associated with the eating occasions.

Discussion

In this sample, the place of consumption was associated with eating occasions of different types of food. In particular, the consumption of unhealthy snacks was associated with non-eating places. One hypothesis is that the acceptability of consumption at non-eating place may allow for more frequent unhealthy snack occasions. For example, a non-designated eating place may be a couch in front of a television or a workspace. Moreover, frequent eating at non-designated eating places may mean that individuals are vulnerable to the convenience of accessible but potentially unhealthy food, such as packaged snacks, vending machine items, or fast food.

Both healthy and unhealthy snacking occasions were more likely at work than at home. The propensity of snacking at work suggests that employer policies could have substantial impact on employee dietary behaviors. Improving healthy food options at workplace cafeterias, or even eliminating vending machines, could influence what and how often employees eat. Healthy eating programs are among the ways that employers have sought to improve dietary behaviors of their employees (Story, Kaphingst, Robinson-O’Brien, & Glanz, 2008).

In addition to work, unhealthy snacking was also more likely to occur at other locations outside of the home, such as someone else's house. An eating environment that includes the presence of others while socializing at someone else's house may trigger the offering of food as entertainment as well as mindless eating. Last, although consumption of sugar sweetened beverages occurs most frequently at home, the likelihood of consuming a sugar sweetened beverage is considerably higher when dining out at fast food outlets or restaurants than at home, suggesting that point of purchase marketing may play an important role in beverage choice.

Although the sample is diverse and heterogeneous in terms of sex and race, the generalizability of the findings is limited by the small sample size and the sampling. A non-random sample was used and there may be selection bias of participants who were recruited from parks or near parks. For example, individuals visiting parks or live near parks may have greater interest in their health compared to other individuals, which could conservatively bias these findings.

The eating occasions data were collected for a one-week period, rather than within a 24-hour recall period that is frequently used in the literature (Ma et al., 2009). However, a limitation of this study is that a one-week period may still not be long enough to capture eating out behaviors for individuals who infrequently eat away from home at food service outlets. In this one-week diary, 76% of participants reported visiting at least one food service outlet. In addition, eating occasions were used as a unit of measurement for the one-week diary period to reduce respondent burden. Thus, the analysis was limited to frequency of eating, and the findings do not apply to the quantity of food consumption. The diary also did not ask the respondent to describe meals, which could have contained high- or low-nutrient foods. Like all diary-based studies, the data are self-reported and subject to underreporting (Subar et al., 2003). The reporting of eating occasions may also be subject to participant bias in reporting particular food items consumed as well as places of consumption.

The food and travel diary format allowed for collection of data on food consumed at each place visited. Although meal types were clearly delineated, multiple eating occasions involving snacks and beverages at one location could not be distinguished from multiple snack items or beverages during just one eating occasion. However, the mean of 6.5 daily eating occasions (SD 2.2) is comparable to the number of eating occasions collected using the NHANES dietary recall instrument. From the 2005-2006 NHANES, a mean of 5 daily eating occasions (range 3.5–7.0) was reported (Popkin & Duffey, 2010). Although the average numbers of eating occasions are comparable, the definition of eating occasions in the present study differs from the definition used by Popkin et al. Both studies consider meals and snacks of food and beverages as eating occasions; however, Popkin et al. combined multiple snack items consumed within 15 minutes into single occasions. In the present study, the data were collected by places visited and the snacks consumed at a particular location could not be disaggregated by time. Although multiple snack items may be consumed during a single eating occasion, the snacking occasions here reflect the number of healthy, unhealthy, and other snacking occasions at each location, without accounting for the time at which each snack item was consumed at the place described in each diary entry.

Despite these limitations, the findings suggest that non-eating places are related to the eating occasions and the type of food consumed. Future studies should be conducted in more representative samples and collect further details about places of consumption in order to help design programs aiming to promote healthy eating environments.

Conclusion

The context of an individual's surrounding environment may play an important role in diet and nutrition as individuals consume food and beverages in numerous eating environments, including at home and food service outlets and in non-eating places. In this study, the eating environment was characterized by the eating place as designated for eating, non-eating, or in transit. Despite the greater frequency of consumption at home, snacking occasions were more likely to occur at work than at home and unhealthy snacking occasions were more likely to occur at non-eating places. This suggests that employers have a role to play in setting policies that govern what foods they make accessible to employees, as well as where and when employees may eat. A better understanding of the relationship between eating behaviors and the contextual factors surrounding an individual may inform strategies to build healthy eating environments.

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Highlights

- Nearly one-third of eating occasions occurred at non-designated eating places.
- Unhealthy snacking was associated with non-designated eating places.
- Snacking occasions were more likely at work than at home.
- Consumption of different types of food was related to the place of consumption.

Table 1

Participant characteristics

	N	Percent
Age (years)		
18 – 35	107	47
36 – 59	80	35
60 – 85	39	17
Sex		
Female	125	55
Male	101	45
Ethnicity		
Non-Hispanic white	112	50
Non-Hispanic black	59	26
Hispanic	34	15
Other	21	9
Education		
Some high school or GED	51	23
Some college or vocational	54	24
College	76	34
Post graduate	45	20
BMI (kg/m^2)		
18 – < 25	80	35
25 – < 30	72	33
≥ 30	74	32
City		
Los Angeles, California	47	21
Chapel Hill, North Carolina	45	20
Albuquerque, New Mexico	45	20
Columbus, Ohio	47	21
Philadelphia, Pennsylvania	42	19
Total	226	
	Mean (SD)	
MVPA (minutes per day)	26 (20)	

GED, General Educational Development; BMI, body mass index

Table 2

Summary of food diary data

	Mean (SD)	Percent
Daily eating occasions	6.5 (2.2)	100
Meal	2.5 (0.5)	38
Snack	1.7 (1.3)	26
Healthy snack	0.6 (0.7)	
Unhealthy snack	0.8 (0.6)	
Other snack	0.3 (0.6)	
Beverage (excluding water)	2.2 (1.1)	34
Sugar sweetened beverage	0.4 (0.6)	
Non-fruit dessert	0.6 (0.7)	
Non-fruit dessert separate from meal	0.2 (0.3)	2
Daily eating occasions by eating place		100
Designated eating place	4.1 (2.4)	63
Non-eating place	1.8 (2.0)	28
In transit	0.3 (0.5)	5
Unknown	0.2 (1.0)	4
Weekly eating occasions at food service outlets		100
Sit-down restaurant	2.9 (3.9)	50
Fast food/convenience store	2.1 (3.6)	36
Grocery/supermarket	0.4 (1.0)	7
Mall/store	0.4 (1.2)	7

Table 3

Summary of weekly eating occasions at the five most common places of consumption

	Weekly eating occasions									
	Home		**Work**		**Sit-down restaurant**		**Someone else's home**		**Fast food/ convenience store**	
	Mean (SD)	**Percent**	**Mean (SD)**	**Percent**	**Mean (SD)**	**Percent**	**Mean (SD)**	**Percent**	**Mean (SD)**	**Percent**
Meal	10.8 (4.9)	40	1.9 (2.9)	35	1.3 (1.8)	45	0.9 (1.6)	33	0.8 (1.3)	38
Healthy snack	2.4 (3.1)	9	0.6 (1.6)	11	0.1 (0.3)	3	0.2 (0.6)	7	0.1 (0.3)	5
Unhealthy snack	3.0 (2.8)	11	0.8 (1.5)	15	0.3 (0.7)	10	0.4 (0.8)	15	0.3 (0.8)	14
Sugar sweetened beverage	1.5 (2.6)	5	0.3 (1.0)	6	0.2 (0.5)	7	0.3 (0.7)	11	0.3 (1.0)	14
Non-fruit dessert (separate from meal)	0.5 (1.4)	2	0.2 (1.0)	4	< 0.1 (0.2)	1	0.1 (0.3)	4	0.1 (0.4)	5
All eating occasions	27.3 (14.0)		5.4 (8.1)		2.9 (3.9)		2.7 (4.6)		2.1 (3.6)	

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Table 4

Estimates for the association between eating occasion outcomes and predictors

	Odds ratios (95% CI)[a]			
	Healthy snack	**Unhealthy snack**	**Sugar sweetened beverage**	**Non-fruit dessert**
Age (years)	1.00 (0.99, 1.01)	1.00 (0.99, 1.00)	0.99 (0.97, 1.00)	1.01 (1.00, 1.02)
Female	1.53 (1.07, 2.19)*	1.07 (0.83, 1.37)	0.72 (0.48, 1.08)	1.69 (1.23, 2.31)**
Black	1.14 (0.69, 1.88)	1.07 (0.74, 1.55)	1.41 (0.84, 2.36)	1.39 (0.93, 2.09)
Hispanic	1.68 (0.98, 2.90)	1.38 (0.94, 2.00)	1.63 (0.90, 2.96)	1.86 (1.15, 3.01)*
Other race/ethnicity	1.73 (1.06, 2.84)*	1.25 (0.82, 1.91)	0.99 (0.49, 1.98)	1.61 (1.00, 2.60)
White	Reference			
High school, GED, or less	0.80 (0.46, 1.38)	1.45 (0.99, 2.14)	3.14 (1.61, 6.14)***	1.43 (0.82, 2.47)
Some college/vocational	0.93 (0.60, 1.46)	1.62 (1.15, 2.29)**	1.62 (0.87, 3.01)	1.30 (0.82, 2.06)
College	Reference			
Post graduate	0.69 (0.44, 1.08)	1.19 (0.84, 1.69)	1.13 (0.52, 2.47)	1.01 (0.67, 1.54)
BMI (kg/m^2)	0.97 (0.94, 0.99)*	0.98 (0.96, 1.00)	1.04 (1.00, 1.07)*	1.00 (0.98, 1.03)
MVPA (minutes per day)	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)	0.99 (0.98, 1.00)	1.00 (0.99, 1.01)
Non-eating place	1.19 (0.92, 1.53)	1.34 (1.06, 1.70)*	0.85 (0.60, 1.22)	0.89 (0.68, 1.17)
In transit	1.27 (0.81, 2.01)	1.23 (0.86, 1.75)	0.95 (0.54, 1.66)	0.49 (0.29, 0.82)
Designated eating place	Reference			
Sit-down restaurant	0.33 (0.20, 0.54)***	1.03 (0.73, 1.46)	1.70 (1.00, 2.87)*	1.28 (0.85, 1.92)
Fast food/convenience store	0.34 (0.20, 0.57)***	1.12 (0.72, 1.74)	3.30 (2.16, 5.06)***	1.10 (0.73, 1.64)
Work	1.46 (1.06, 2.02)*	1.45 (1.06, 1.97)*	1.02 (0.63, 1.63)	1.37 (0.99, 1.89)
Other places	0.95 (0.73, 1.25)	1.45 (1.15, 1.83)**	1.43 (0.98, 2.09)	1.13 (0.88, 1.45)
Home	Reference			

GED, General Educational Development; BMI, body mass index; MVPA, moderate to vigorous physical activity.

[a]Cities are controlled in all models (data not shown). Significance levels are at 0.001 (***), 0.01 (**), and 0.05 (*). Significance for odds ratios including 1.00 depend on whether the odds ratio was rounded up or down to the nearest one-hundredth.