The Influence of Travel Attitudes, Commute Mode Choice, and Perceived Neighborhood Characteristics on Physical Activity

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Background: This study examines the relationships between physical activity, travel attitudes, commute mode choice, and perceived neighborhood characteristics. A recent study found that people who walk or bike during their commute exercise more outside of the commute than do people who commute by mass transit or car. The current study seeks to explain what might account for this relationship, using ANOVA models (Method) conducted on survey data from 3 cities. Results: Perceived neighborhood characteristics and travel attitudes influence participants’ reported physical activity levels both during the commute and outside of the commute. Conclusion: While the study does not establish causality, the results provide some support for the notion that policy makers interested in increasing physical activity levels should consider changing not only the physical environment, but also perceived neighborhood characteristics and travel attitudes.

Keywords: commuting, exercise, perception, behavior

Health risk factors such as obesity and hypertension relate to physical inactivity; therefore, many groups like healthcare professionals, city planners, and other policy makers are interested in finding ways to encourage the public to become more physically active. One idea for promoting physical activity is to encourage physically active means of commuting to work, such as walking and biking. Studies have shown that a physically active commute increases total physical activity. Notably, one study—Terzano and Morckel—found that people who walk or bike as part of their commute also exercise more outside of the commute compared with people who commute by mass transit or car. In other words, not only does a physically active commute increase total exercise, being physically active as part of the commute may somehow encourage people to be physically active in other aspects of their lives. As far as the authors are aware, this study is the only one to examine this relationship thus far. By replicating and expanding upon the Terzano and Morckel study, the current study seeks to understand possible reasons why active commuting is associated with extra exercise outside of the commute.

Terzano and Morckel surveyed faculty and staff working at universities located in Youngstown, Ohio; Columbus, Ohio; and Washington D.C. regarding the transit mode for their work commute, physical activity related to their commute, and physical activity engaged in for recreation. In addition to incorporating these questions, the current study asked questions related to 1) perceived neighborhood characteristics and 2) travel attitudes in relation to commute modes, as will be further discussed.

Neighborhood Characteristics

Previous studies have indicated a relationship between the built environment and travel behavior. More than 50 studies since 1990 have examined this relationship, and more than 30 studies have found a statistically significant influence of the built environment on travel behavior while controlling for self-selection.9

Similarly, many studies have examined the relationship between the built environment and activity or exercise. These studies have found that numerous environmental characteristics influence physical activity, including neighborhood upkeep, presence of sidewalks, physical signs of incivilities, and various others.2,10,11 Thus, neighborhood characteristics might be mediating variables between the choice of commute mode and physical activity during or after the commute. Terzano and Morckel did not assess physical or perceived physical characteristics of the participants’ neighborhoods.

Measuring the actual physical characteristics of many neighborhoods in 3 cities was beyond the scope of the study, and behavior would more likely relate to perceived characteristics since the individual makes decisions based on his or her perceptions. Perceptions influence our thoughts and evoke emotional reactions.
Perhaps more importantly, emotional reactions contribute to cognitive appraisals, which can impact behavior. Thus, the current study asked participants about their perceived characteristics of their neighborhoods.

One study that measured perceived and physical characteristics of neighborhoods found that physical activity for transportation increased with positive perceptions of neighborhood aesthetics, number of destinations, and access to public transit and bike lanes and that recreational activity was positively associated with perceived access to recreational facilities. Although a second study found no associations between perceived environmental characteristics and walking to get to and from places, most of the research suggests an influence of perceived environmental characteristics on physical activity. The current study assessed the perceived environment to control for it as a mediating variable in relation to physical activity related to the commute. We anticipated that participants who perceive their neighborhoods as being more conducive to walking or biking would report walking or biking more than others both during and outside of the commute.

Importance of Attitudes

Travel attitudes may also affect commute mode and exercise. Cao et al., through the use of an SEM modeling approach, found that travel attitudes directly influence where people move. Since home location and preference for transportation mode may be related, travel attitudes could influence commute mode choice. Pinjari et al. provided evidence that the built environment affects commute mode choice, even after controlling for effects of self-selection. Of particular relevance to the current study, Pinjari et al. note that attitudes may affect mode choice. In other words, people consider their desired commute mode when deciding where to live; they do not decide where to live and then consider commuting. Thus, residential location choice is an endogenous variable, as other factors (such as travel behavior and attitudes) may determine residential location.

Other studies show a relationship between attitudes and mode choice, but few examine the connection between attitudes, mode choice, and physical activity. There are 2 notable exceptions. In a study designed to identify predictors for initiating and maintaining active commuting, Merom, Miller, van der Ploeg, and Bauman asked participants to indicate the importance of 8 statements about travel modes. Two were significant in predicting single-day active commuting: the importance of taking public transport to avoid the stress of driving and the importance of leaving the car at home to avoid parking problems. Bopp, Kaczynski, and Wittman examined individual-level perceptions and values as they relate to active transport. They found that having a strong “environmentally friendly attitude” (EFA) relates to perceptions of fewer barriers and more motivators for engaging in active forms of transport. They also found that a stronger EFA corresponds to higher, self-reported active commuting, and higher self-efficacy for active commuting. Our paper adds to the literature by further examining the influence of travel attitudes on physical activity both during and outside of the work commute, using attitude statements from Cao et al. (see “Measurements” section).

Hypotheses

We had 3 expectations: first, in agreement with Terzano and Morckel, exercising as part of the commute will be positively associated with exercising outside of the commute. In other words, people who walk or bike to or from work will engage in more physical activity independent of the commute. Second, in agreement with Hoehner et al., respondents who perceive their neighborhoods as being more conducive to walking or biking will report walking or biking more than others both during and outside of the commute. Third, consistent with the findings of Pinjari et al., respondents whose travel attitudes favor walking or biking over car use will be more likely to exercise both during and outside the commute.

Methods

Participants

To explain the findings of Terzano and Morckel, this study sought a demographically similar sample. As in that study, random samples were drawn from campus directories of faculty and staff from colleges and universities in Youngstown, Ohio; Columbus, Ohio; and Washington D.C. Due to the confidential nature of the surveys, we do not know if the 2 studies have some overlap in participants. Of the 600 faculty and staff contacted, 17% (50 female, 41 male, 8 not indicating gender) completed the survey—35 people from Youngstown, 36 from Columbus, and 28 from Washington D.C. Participants were demographically similar among the 3 cities. About half of the respondents were between 36 and 55 years old, and most respondents (79.8%) were Caucasian. The sample varied in education from a high school diploma or GED (2.0%), some college or associate’s degree (8.1%), bachelor’s degree (15.2%), master’s degree or professional degree (38.4%), and a doctorate degree (24.2%). Participants reported their occupation as graduate teaching/research assistant (3.0%), administrative (clerical and support personnel; 18.2%), administrative (office managers and supervisors; 28.3%), and faculty/instructor/educator (39.4%).

Procedure

Prospective participants received an e-mail asking them to take part in a study about the commuting behaviors and travel attitudes of people working in the 3 cities. Participants were asked to click on a provided link to complete a short on-line survey on SurveyMonkey. The e-mail stated that participants must be older than 18, that all answers are confidential and anonymous, and that
participants could refuse to answer any question, refuse to participate, or withdraw without penalty or repercussion at any time. The study received IRB approval, and informed consent was obtained from all participants.

The survey had 5 kinds of questions (see Appendix for more details):

1. Location: these questions asked participants where in the metropolitan area their home is located and the distance (in miles) from their home to work
2. Commuting behaviors: questions asked what modes of transit participants used to get to and from work last week
3. Activity/exercise behaviors: questions asked the amount of time participants engaged in each of 11 physical activities for recreation and/or exercise outside of their commute to work, during the previous week
4. Travel attitudes and perceived neighborhood characteristics: these questions, derived from Cao et al (2007), are addressed in the next section
5. Sociodemographics: questions asked participants to report their gender, race/ethnicity, occupation, education, age, and income.

**Measurements**

To measure the influence of travel attitudes and perceived neighborhood characteristics, we used a process similar to the one used by Cao et al, who asked participants to indicate how strongly they agreed or disagreed with a series of travel attitude and neighborhood characteristic statements. Separate factor analyses for the 2 kinds of statements found a 4-factor solution for travel attitudes and a 6-factor solution for perceived neighborhood characteristics. Table 1 shows the statements that had the highest loadings on each of the 4 travel attitude factors. Table 2 shows the 2 statements that had the highest loadings on each of the 6 neighborhood characteristics factors. In all, the current study used 21 statements to assess travel attitudes and perceived neighborhood characteristics. The survey reworded some of the perceived neighborhood characteristic statements into complete sentences, and asked participants to indicate how strongly they agreed or disagreed with the statements on a 5-point scale.

**Analyses**

A primary purpose of this study is to investigate why there is a difference between physically active and non-physically active commuters in terms of the amount of recreational exercise reported. Therefore, it was necessary to first confirm that such a difference does indeed exist—especially since, to our knowledge, only 1 study has examined this relationship to date. Thus, the first step in our analysis was to compare the amount of recreational physical activity that commuters from each of the 3 groups reported (physically active commuters, car commuters, and mass transit commuters) using t tests with post hoc pairwise comparisons with Bonferroni adjustments for multiple claims.

The next step was to compute the correlation matrix for travel attitudes and, separately, the correlation matrix for perceived neighborhood characteristics. Correlations between the variables were low enough to justify including the variables together in an ANOVA model. We ran a total of 4 preliminary ANOVA models: 1) travel attitudes as the independent variables and transit mode as the dependent variable, 2) travel attitudes as the independent variables and recreational physical activity as the dependent variable, 3) perceived neighborhood characteristics as the independent variables and transit mode as the dependent variable, and 4) perceived neighborhood characteristics as the independent variables and recreational physical activity as the dependent variable.

Using the variables that were significant in each of those ANOVA models, we combined the variables into an ANCOVA model that explains transit choice holding age, gender, and occupation constant. From there, we eliminated nonsignificant variables for the most parsimonious

<table>
<thead>
<tr>
<th>Table 1 Four Factors of Travel Attitudes (Cao et al, 2007)</th>
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</thead>
<tbody>
<tr>
<td><strong>Factor</strong></td>
</tr>
<tr>
<td>Pro-bike/walk*</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Travel minimizing</td>
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<td></td>
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<tr>
<td>Safety of car</td>
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<td></td>
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<tr>
<td>Car dependent</td>
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* Three statements were used to capture both walk and bike, since the factor loadings were high for all 3.
model, which was our final model. All ANOVA and ANCOVA models were conducted at an alpha level of .05.

Results

Did those participants who reported more physically active commutes also report exercising more outside of the commute? In some cases, yes, but this expectation was not supported for all types of exercise. Post hoc pairwise comparisons with Bonferroni adjustments for multiple claims revealed statistically significant differences between Car Only and Physical at Some Point ($F_{1,73} = 73.235, P < .010$), but no significant differences between Car Only and Mass Transit ($F_{1,73} = 3.750, P = 1.000$), or between Physical at Some Point and Mass Transit ($F_{1,73} = 76.985, P = .053$). In other words, participants who walked, biked, or took mass transit as part of their commute reported higher amounts of walking and biking outside of their commute, compared with other groups. No relationship was found between physically active commutes and other kinds of exercise that could not be used for commuting, such as kickboxing, soccer, or yoga. Furthermore, people who commuted by car exercised less than people who had physical activity as part of their commute, but they did not exercise less than people who used mass transit.

We also examined whether participants walk or bike more during the commute when they perceived their neighborhoods as being more conducive to walking or biking. We tested 12 statements about respondents’ perceptions of their neighborhoods; however, only the statement concerning the diversity of neighborhood residents was individually statistically significant in explaining transit choice ($F_{4,30} = 3.460, P = .015$). Respondents who perceived their neighbors to be more diverse, in terms of ethnicity, race, and age, were more likely to have a physically active commute.

In relation to walking and/or biking outside of their commute, 4 of the perceived characteristics of neighborhoods had statistically significant positive effects on recreational walking/biking: less crime in the neighborhood ($F_{3,70} = 4.148, P = .010$), more diversity ($F_{3,70} = 5.200, P = .003$), greater attractiveness of the neighborhood ($F_{3,70} = 3.126, P = .042$), and smaller yard size ($F_{3,70} = 2.862, P = .042$).

Next consider attitudes toward walking or biking in relation to exercise in and outside the commute. Of the 8 statements concerning travel attitudes, only 1 had a statistically significant effect on the commute mode. If people felt that getting to work without a car was a hassle, they were less likely to have a physically active commute ($F_{4,89} = 4.283, P = .004$). In relation to physical activity outside the commute, 2 travel attitudes had statistically significant effects. Participants reported higher rates of exercise outside of the commute when they thought that fuel efficiency was important ($F_{4,70} = 3.263, P = .031$) and that using a car is not necessarily safer than using mass transit ($F_{4,70} = 2.855, P = .035$).

Since this study found support that physical activity is related to commute mode, our final model considers all of the aforementioned variables that might impact commute mode choice. Initially, this model included all previously significant variables. Certain previously significant variables, however, such as fuel efficiency and perceived mass transit safety, were no longer significant, and we eliminated them from the final model. Holding age, gender, and occupation constant, the model explained 90% of the variance in transit choice (Adjusted $R^2 = .905$) through a combination of 6 variables: the total amount of noncommute physical activity ($F_{25,71} = 3.65, P = .001$), the distance between home and work ($F_{3,71} = 9.249, P < .001$), whether using a car for commuting is safer than taking mass transit ($F_{4,71} = 4.73, P = .006$), whether getting to work is a hassle without a car ($F_{4,71} = 4.468, P = .008$), the diversity of neighborhood residents ($F_{4,71} = \ldots$)

### Table 2 Six Factors of Perceived Neighborhood Characteristics (Cao et al, 2007)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>My neighborhood has easy access to a regional shopping mall.</td>
</tr>
<tr>
<td></td>
<td>My neighborhood has easy access to downtown.</td>
</tr>
<tr>
<td>Physical activity options</td>
<td>There are good bicycle routes beyond my neighborhood.</td>
</tr>
<tr>
<td></td>
<td>There are sidewalks throughout my neighborhood.</td>
</tr>
<tr>
<td>Safety</td>
<td>My neighborhood is quiet.</td>
</tr>
<tr>
<td></td>
<td>My neighborhood has a low crime rate.</td>
</tr>
<tr>
<td>Socializing</td>
<td>My neighbors are diverse in terms of ethnicity, race, and age.</td>
</tr>
<tr>
<td></td>
<td>There are lots of people out and about within the neighborhood.</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>My neighborhood has an attractive appearance.</td>
</tr>
<tr>
<td></td>
<td>My neighborhood has a high level of upkeep.</td>
</tr>
<tr>
<td>Outdoor spaciousness</td>
<td>My neighborhood has large back yards.</td>
</tr>
<tr>
<td></td>
<td>My neighborhood has large front yards.</td>
</tr>
</tbody>
</table>
4.591, \( P = .007 \)), and the size of yards (\( F_{4,71} = 8.191, P < .001 \)); see Table 3. We included the distance between home and work as an explanatory variable because it may be impractical for respondents who live, for example, 15 miles from work to walk or bike for their commutes. Note that, taken alone, distance between home and work is only moderately correlated with transit choice (\( r = .484 \)).

**Discussion and Conclusion**

This study provides support that the 4 variable sets of interest (physical activity, commute mode, perceived neighborhood characteristics, and travel attitudes) are interrelated. It does not establish that any 1 variable or set of variables *cause* an increase in physical activity. To infer causality, the following requirements must be met: that cause precedes effect, that cause covaries with effect, that alternative explanations can be ruled out, and that knowledge is available of what would have happened in the absence of the cause. This study was not designed to meet these conditions. Rather, it may be most appropriate to consider the study a pilot study since it uses a small sample size to indicate associations worthy of further, more methodologically rigorous, investigation.

In addition, the cross-sectional nature of the study (ie, the sampling of college faculty and staff, many of whom did not respond) leaves us uncertain as to how well the results generalize to other populations. Thus, future studies should seek larger sample sizes and should sample from populations in other cities and from different demographic groups. Furthermore, it may be useful to consider participants’ ideal commute choice in future studies, as this may eliminate some biases that may exist based on local transit availability and home location.

Another limitation of the study is that we do not know how well our measures of perceived environment compare with established measures such as the Neighborhood Environment Walkability Survey (NEWS). It is also possible that the results are simply a remnant of lifestyle choice—perhaps people who are more physically active overall engage in more physical activity both during and outside of the commute. Also, recall that we asked respondents to report the travel modes used to commute to/from work during the previous week. Whether the responses to this question are indicative of the “typical” mode(s) used to commute to or from work (perhaps during other times of the year) is not known. It is possible that weather or other extenuating circumstances account for the mode(s) used by participants that particular week. Other unmeasured factors, such as the availability of shower facilities at work and perceived characteristics of the routes between home and work, might also affect physical activity in the commute. These topics are ripe for additional research.

Despite these limitations, this study adds to the literature in several ways. First, it provides further evidence that biking or walking to work may be related to being physically active outside of the commute. This result is important because it suggests that one way to increase the public’s physical activity levels is by encouraging more physically active forms of commuting. Alternately, it may be that people who are more physically active in general are also more likely to choose physically active commuting modes. In that case, it may be worthwhile to target people who are already physically active to encourage them to walk or bike to work. The verdict for mass transit commuting is less clear, for in contrast to Terzano and Morckel, but in agreement with Wener and

**Table 3** ANCOVA for Overall Model for Transit Mode

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>69.795 *</td>
<td>48</td>
<td>1.454</td>
<td>15.168</td>
<td>.000</td>
<td>.969</td>
</tr>
<tr>
<td>Total_Amt_Exercise*</td>
<td>8.749</td>
<td>25</td>
<td>.350</td>
<td>3.650</td>
<td>.001</td>
<td>.799</td>
</tr>
<tr>
<td>Distance*</td>
<td>2.660</td>
<td>3</td>
<td>.887</td>
<td>9.249</td>
<td>.000</td>
<td>.547</td>
</tr>
<tr>
<td>Car_Safer_Transit*</td>
<td>1.814</td>
<td>4</td>
<td>.453</td>
<td>4.730</td>
<td>.006</td>
<td>.451</td>
</tr>
<tr>
<td>To_Work_Hassle*</td>
<td>1.713</td>
<td>4</td>
<td>.428</td>
<td>4.468</td>
<td>.008</td>
<td>.437</td>
</tr>
<tr>
<td>Diversity*</td>
<td>1.760</td>
<td>4</td>
<td>.440</td>
<td>4.591</td>
<td>.007</td>
<td>.444</td>
</tr>
<tr>
<td>Large_Yards*</td>
<td>3.141</td>
<td>4</td>
<td>.785</td>
<td>8.191</td>
<td>.000</td>
<td>.588</td>
</tr>
<tr>
<td>Gender</td>
<td>1.216</td>
<td>1</td>
<td>1.216</td>
<td>12.686</td>
<td>.002</td>
<td>.355</td>
</tr>
<tr>
<td>Age</td>
<td>1.564</td>
<td>1</td>
<td>1.564</td>
<td>16.312</td>
<td>.001</td>
<td>.415</td>
</tr>
<tr>
<td>Occupation</td>
<td>.013</td>
<td>1</td>
<td>.013</td>
<td>.132</td>
<td>.720</td>
<td>.006</td>
</tr>
<tr>
<td>Error</td>
<td>2.205</td>
<td>23</td>
<td>.966</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>72.000</td>
<td>71</td>
<td></td>
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</tbody>
</table>

\( a R^2 = .969 \) (Adjusted \( R^2 = .905 \)).

*Note.* Dependent variable: type of transportation to work.

\( * = \) significant at alpha of .01.
Evans, this study found that people who commuted via mass transit also walked or biked more for recreation than people who drove to work.

Only some of the perceived neighborhood characteristics and travel attitudes were significant in explaining 1) recreational behavior and 2) exercise as part of the commute. We found that participants who perceive their neighborhoods as being more conducive to walking or biking report that they walk or bike more than others during and outside of the commute. The same is true for participants who reported having more diverse neighbors (in terms of race, ethnicity, and age). Why there appears to be a relationship between neighborhood diversity and exercise is a topic for further investigation. Perhaps persons who regularly walk or bike are more likely to interact with neighbors than are persons who solely commute by car. Perhaps the possibility of meeting others different from oneself encourages some people to engage in activities (such as walking through the neighborhood or attending a yoga class) that increase the chances of meeting new people. Another, perhaps more probable, possibility is that people who prefer diversity also prefer to live in walkable neighborhoods conducive to physical activity. In other words, there could be a self-selection bias or a mediating variable that explains the relationship. Given the data collected in this study, we can only speculate. It is also important to note that as environments change, attitudes could concurrently change. This study does not examine this possibility for it would require the use of a different method that accounts for recursive relationships.

Participants also reported more exercise outside of the commute when they perceived their neighborhoods as attractive, safe, and composed of small yards. These results are consistent with the literature on crime prevention through environmental design (CPTED), which shows that people are less willing to spend time in places perceived to be high in crime, and are less likely to stay in environments that make them vulnerable to potential crime.24,25 The literature further indicates that people are more likely to believe that an area has less crime when they perceive that it has fewer social incivilities (eg, gangs) and physical incivilities (eg, graffiti and trash), which may be related to the attractiveness of neighborhoods.26 Harkening back to Jane Jacobs, small yards may be an indicator of “eyes on the street,” as denser neighborhoods likely increase the probability that one will be seen, since there are usually more people present. Small yards in our study may also serve as an indicator of walkability. Denser, more compact neighborhoods have been found to be associated with walking, bicycling, and taking mass transit more so than less dense and less compact neighborhoods.28

For travel attitudes, participants who believe that getting to work without a car is a hassle are less likely to use physically active means for commuting. Likewise, when implementing a new mass transit system, a “bike to work” program, or any other initiative that encourages people to rely less on the car, it may be necessary to conduct some type of marketing campaign touting the speed and convenience of the new system. The importance of attitudes was further emphasized by the finding that participants were more likely to exercise outside of the commute when they believed that fuel efficiency is important and that cars are not safer than mass transit. Thus, educating the public on the cost-savings and safety of a physically active commute could be an effective strategy for encouraging physical activity. Overall, the current study provides the takeaway message that to increase physical activity levels, it may not only be important to change the physical environment, it may also be necessary to change peoples’ perceptions and attitudes.

Finally, recall that our overall model for travel mode choice included 6 independent variables (distance between home and work, amount of physical activity, perceived diversity of neighbors, perceived size of yards, attitudes about convenience of driving a car to work, and attitudes toward safety of driving a car to work versus taking mass transit) explained about 90% of the variance in transit choice. This percentage is large for travel choice studies and points to the importance of continuing to explore additional variables that may influence travel choice and physical activity. Further advances in this type of research may lead to more effective planning and policy efforts that encourage active living and healthy communities.

References

1. If participants did not commute to work in the previous week, they were asked to respond to the questions in relation to a typical week.
2. There are 21 statements (not 20) because the authors retained 3 statements for the first factor due to the high factor loadings.
3. Car Only is used for participants reporting using a car as the only mode of transportation during their commute. Mass Transit is used for participants who reported riding the bus, subway, and/or commuter train for part or all of their commute—and may have also used a car—but did not walk or bike. Physical at Some Point indicates that the participant walked and/or biked for part or all of their commute and may have also used a car and/or mass transit.
4. The NEWS uses 98 questions to determine the perception of neighborhood design features hypothesized to be related to physical activity. We did not use this measure for practical reasons: we were concerned that by adding questions, sample size would decrease.

Notes


Appendix

Commute Mode and Physical Activity Assessment: Questions Asked of Respondents

If you commuted to work last week, answer the questions below in relation to last week. If you did not commute to work last week, answer the questions below in relation to your typical weekly behavior. (If you typically work from home year-round, please indicate that by checking the “Other” box, and writing in “work from home” or “telecommute.”)

Q1. Which forms of transportation did you use to commute *to* work? (Please check all that apply). (Car, Bus, Walk, Bicycle, Other [please specify a form of transportation])

The next question asks about your commute FROM work TO Home. If you commuted from work last week, answer the questions below in relation to last week. If you did not commute from work last week, answer the questions below in relation to your typical weekly behavior. (If you typically work from home year-round, please indicate that in the “Other” box and note “work at home” or “telecommute.”)

Q2. Which forms of transportation did you use to commute *from* work? (Please check all that apply) (Car, Bus, Walk, Bicycle, Other [please specify a form of transportation]).

Q3. How strongly do you agree with the following statement: If I were to walk or bike as part of my commute to/from work, I would not exercise outside of the commute because I would feel like I already “got my exercise in” for the day (Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree).

Q4. If you already walk or bike to work as part of your commute . . . Do you feel that walking or biking to work encourages you to exercise more in your free time? If you do not walk or bike, just click next (Yes, No; If YES, please explain).

Q5. Outside of your commute to or from work, what activity or activities did you do for recreational purposes and/or exercise? Please respond by indicating the amount of time you spent on each group of activities in the past week (skip/leave blank any activities you did not do).

(There was a box to indicate the number of minutes spent on each.)

Walking, jogging, hiking
Bicycling
Yoga, pilates, fitness class
Weight training, calisthenics (push-ups, sits-ups, etc.)
Martial arts, boxing, kickboxing
Swimming, canoeing, rowing
Golf, tennis
Softball, baseball
Soccer
Dancing
Bowling

Other (please specify activity and amount of time)