

Neighborhood Influences on Diet and Physical Activity

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ABSTRACT

Objective: To examine associations between neighborhood characteristics and diet and physical activity in those of differing socio-economic status.

Design: A cross-sectional study was conducted among US adults living in a small Southeast community, including individuals at lower income levels. Physical activity was self-reported and objectively measured with a pedometer. Diet, self-efficacy, and perception of neighborhood friendliness were self-reported.

Main outcome measures: Minutes of physical activity, self-efficacy towards physical activity, where residents exercised, and perception of neighborhood friendliness towards physical activity.

Statistical Analysis Performed: Associations between where participants exercise and their minutes of daily exercise were analyzed by independent t-tests ($p < 0.05$). Income level and minutes of daily activity were analyzed with t-tests and later with UNIANOVA, controlling for age. Income and where participants exercise was analyzed using Chi square. Distance to the park and minutes of daily activity was analyzed with Pearson's correlation (two-sided, $p < 0.05$).

Results: Income was not associated with daily minutes of physical activity or where a person chose to be active. Age was the biggest predictor of physical activity. Living on a street with a hill was positively correlated with self-efficacy for physical activity but negatively correlated with perception of neighborhood friendliness towards physical activity.

Conclusion: Both high and low SES residents, within the same neighborhood, having access to the same recreational opportunities, did not differ in levels of physical activity. Both income groups met the current recommendations for physical activity suggesting access to parks with walking/biking trails, as well as other facilities, increases actual energy expenditure, independent of SES.

Applications: Health officials and urban planners could work together in creating more recreational opportunities, especially in low SES neighborhoods, to increase national levels of physical activity.

Attribution

My time at Virginia Tech has been a rewarding and successful one, thanks to Dr. Kathy Hosig, my advisor and confidant, who has encouraged and challenged me at every turn. She and the other faculty members, Dr. Sharon Nickols-Richardson, Dr. William Herbert, and Dr. Eileen Anderson have been invaluable throughout my writing process.

Dr. Kathy Hosig received her B.S. in Human Nutrition, and Foods/Dietetics from Virginia Polytechnic Institute and State University. She received a M.P.H. in Public Health Leadership from the University of North Carolina, Chapel Hill and her Ph.D. in Foods and Nutrition from Purdue University. Her time and effort put forth into this project, as well as her direction, is incalculable.

Dr. Sharon Nickols-Richardson received a B.S. in Foods, Nutrition, and Institutional Administration from Oklahoma State University and her Ph.D. in Food and Nutrition from the University of Georgia. She contributed a great amount of her time and was vital for the body composition data collection phase of my project.

Dr. William Herbert received his B.S. and Ph.D. in Exercise Physiology from Kent State University. He was very helpful in the analysis of my data and in helping me explore new avenues during the interpretation of my data.

Dr. Eileen Anderson contributed her time and expertise into the statistical methods and data analysis of my project. She received her B.A. in Psychology at the University of Virginia, her M.Ed. from James Madison University, and her Ed.D. from Virginia Polytechnic Institute and State University.

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Neighborhood Influences on Diet and Physical Activity

Chapter 1:

Introduction

The obesity epidemic facing the United States affects all racial, ethnic, age, and socioeconomic groups. The numbers are rising; nearly two thirds of US adults between the ages of 20 and 74 are overweight, including 31% considered obese (1). The number of children classified as overweight is growing just as rapidly. As many as 15% of children aged six to 19 years are overweight according to data from 1999 and 2000 (1). This percentage has doubled in the last 20 years. Overweight children have a greater chance of becoming overweight as adults and the likelihood that they will encounter chronic health problems, such as cardiovascular disease, certain cancers, osteoarthritis, and depression, rises significantly. Some researchers believe that being overweight itself is not the main cause of these health related diseases (2). Lifestyle behaviors associated with obesity, like physical inactivity and poor diet, may play a bigger role in contributing to their health problems. Sedentary living is associated with a number of debilitating health conditions, including the development of overweight and obesity, cardiovascular disease, type 2 diabetes, and certain cancers (3). According to one estimate, if the most inactive portions of the population increased their physical activity, as many as one third of these diseases associated with overweight could be avoided (4).

A healthy diet is important for maintaining an ideal body weight but new studies suggest physical activity is potentially more effective as a weight management tool than dietary changes (4). When looking at weight loss without diet intervention, researchers found that exercisers lost an average of 5 lb more than nonexercisers over a 9-month

period. Studies that incorporated dietary behaviors into exercise interventions revealed that subjects in a diet and exercise group maintained weight loss at one year follow-up significantly better than subjects in a diet only group. The benefits of physical activity are not limited to weight loss and weight maintenance. Cardiovascular fitness enhances heart health due to its positive effects on body fat distribution as measured by waist circumference, waist-to-hip, and waist-to-thigh circumference ratios.

Millions of dollars are spent every year in health care costs attributed to obesity related disorders. Increasing physical activity might be an effective approach to curtailing some of these costs. Increasing physical activity has become such a focus that it is now one of the ten “leading indicator” areas within the national health objectives of Healthy People 2010 (5). Known health benefits of physical activity include reduced stress, anxiety, and depression; reduced risk of developing high blood pressure, colon cancer, diabetes, and cardiovascular disease; maintenance of healthy bones, muscles, and joints. Increased physical activity has also been associated with having a healthier diet (6). In spite of all the known benefits of exercise, more than one quarter of the American population remains inactive, contributing to nearly 300,000 premature deaths each year. It has been estimated that 60% of Americans do not participate in enough physical activity to achieve health benefits (1).

The goal of increasing physical activity has lead researchers to study the underlying variables that influence physical activity (7). Personal, social, and environmental factors all seem to play a role in adults’ participation in physical activity. Of those, the physical environment is the least studied type of influence on physical activity. With walking being the most commonly reported physical activity behavior, and

the easiest to influence in sedentary people, focusing on the environmental determinants that make walking more accessible should be a priority among researchers and program developers(4).

It is known that the built environment influences physical activity, yet its attributes are not well understood (8). The built environment is defined by urban design factors, land use, and available public transportation for a region, as well as the available activity opportunities for people within that space (9). A person's built environment has the power to either hinder or facilitate physical activity and healthy eating.

Environmental changes may be the key to influencing behavior change in sedentary people and eventually reducing the rate of obesity because of its potential to affect large populations rather than focusing on individual behavior change (10).

To increase population rates of physical activity it is important for program planners and policy makers to understand what environmental factors influence physical activity. Many studies have examined neighborhood characteristics, such as the condition of sidewalks, the presence of bike paths, street design, traffic volume and speed, and crime but more data are needed on the relationship between objective measures of environment and perceived environment measures to assess the influence of specific components of the built environment (8). Those more inclined to participate in physical activity are likely to perceive their physical environment differently than those who are physically inactive. Including objective measures will help show a stronger association between environmental factors and physical activity. The physical environment also plays a major role in physical activity and diet habits of people considered to be of low socio-economic status (18). This should be an area of focus due

to the high rates of overweight and obesity in this particular population. Research in this area will help address possible barriers to physical activity within a person's neighborhood.

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Chapter 2:

Review of Literature

Physical Environment Variables

Many studies have linked physical environment with levels of physical activity and weight status, but have yet to completely define what characteristics about the physical environment have the most influence on these outcomes. Variables that have been studied include: general neighborhood environment for physical activity, general aesthetics, general walkability, level of perceived safety in the neighborhood, traffic (heavy or not), presence of walking/bicycling trails, distance to trails, length of trails, presence of sidewalks, presence of parks, presence of green/open space, presence of shops within walking distance, overall number of recreational facilities present, frequency of seeing others exercising, street connectivity, and land-use mix (1). While there seems to be at least a weak association between all individual variables and physical activity, results have been inconsistent across studies.

Humpel et al reviewed 19 quantitative studies on the relationship between specific physical environment attributes and physical activity behavior to compare recent evidence and relevant data for these relationships (1). The studies reviewed included either the perceived physical environment or objective measures of the environment, and one study included both. Findings were divided into one of five categories: accessibility of facilities, opportunities for activity, weather, safety, and aesthetic attributes. Accessibility, opportunities, and aesthetics had the most significant associations with physical activity, while weather and safety showed weak relationships. The investigators concluded that environmental attributes have consistent associations with physical

activity but more information is needed for relevant policies and interventions to occur. Measurement of physical activity environments must be conducted using valid, reliable methods before determining which neighborhood factors play the biggest role in influencing physical activity.

The most commonly reported safe and convenient places for walking are neighborhood streets and sidewalks and public parks. Powell and colleagues investigated whether access to safe and convenient places for walking was associated with physical activity behaviors (2). To assess respondents' usual physical activity patterns, a random-digit-dialed telephone survey of health-related behaviors (Georgia Behavioral Risk Factor Surveillance System) was administered to Georgian adults aged 18 years and older. Respondents were categorized into two groups; meeting current recommendations for physical activity or not (30 minutes of moderate activity per day, 5 days per week, or 20 minutes of vigorous activity, 3 days per week). To isolate convenience as a variable, survey questions were broken into three categories based on time and mode of travel to the location of engaged activity: (1) fewer than 10 minutes walking, (2) fewer than 10 minutes not walking, (3) equaling 10 minutes or more independent of transportation. There was a significant relationship between those who reported having a place where they felt safe walking for exercise or recreation and the number of people likely to meet current recommendations for regular physical activity (41.5%; 95% CI=39.4%, 43.6%) compared to those who felt they did not have a place to walk (27.4%; 95% CI=21.2%, 33.7%). An increase in convenience to walking place also increased likelihood of meeting current activity recommendations. Safety and distance to walking place were self-reported perceptions and did not represent actual crime rates or distances and there is

no way of knowing if walking places were actually used or just reported as potential walking places. Overall, convenient access to physical activity resources appears to increase the likelihood of engaging in regular physical activity.

Saelens and colleagues used neighborhoods characterized as either high or low “walkability” to compare physical activity and weight status while investigating the impact of environmental variables on physical activity behavior (3). Two neighborhoods were chosen for recruitment of subjects based on their residential density, mixed land use, and street connectivity. The high-walkability neighborhood had higher residential density (single-family and multiple-family residences), a higher concentration of nonresidential land uses (restaurants, grocery or convenience stores), and had greater street connectivity (gridlike street patterns). The low-walkability neighborhood had low residential density, was mostly residential with few commercial properties, and low street connectivity (more cul-de-sacs). Both neighborhoods had comparable incomes (high-walkability neighborhood, \$40,170; low-walkability neighborhood, \$46,647).

Participants were asked to wear a CSA activity monitor for seven consecutive days to assess objective measures of physical activity. They also completed two surveys measuring neighborhood environmental characteristics related to physical activity.

Environmental characteristics included: residential density; proximity to, and ease of access to, non-residential land uses, such as restaurants and retail stores (land use mix-diversity and land use mix-access); street connectivity; walking/cycling facilities, such as sidewalks and pedestrian/bike trails; aesthetics; traffic safety; and crime safety.

Participants reported total minutes walking during the week of wearing the activity monitor. Height and weight were self-reported to assess body mass index (BMI). As

predicted, higher residential density, land use mix-diversity, land use mix-access, street connectivity, aesthetics, and pedestrian/automobile traffic safety were all perceived to be greater in the high-walkability neighborhood ($p < 0.003$). Surprisingly, greater access to walking/cycling facilities was reported for the low-walkability neighborhood ($p = 0.003$). Perceived crime safety was not significantly different between neighborhoods. When comparing time spent engaged in moderate-intensity physical activity, residents of the high-walkability neighborhood reported a greater number of total minutes walking than the low-walkability neighborhood, by an average of 52 more minutes over the 7 day period ($p = 0.010$). Based on accelerometer values, this number jumped up to 70 minutes more per week between the high and low-walkability neighborhoods. When vigorous-intensity physical activity was objectively measured, there was no significant difference between neighborhoods. Higher BMI's were found among residents of the low-walkability neighborhood on average ($p = 0.051$). The percent of residents meeting the criteria for overweight (BMI of 25 or more) was almost double for the low-walkability neighborhood compared to the high-walkability neighborhood ($p = 0.009$). Height and weight were self-reported which could have affected BMI scores but since both groups self-reported, it is likely not to have had a major effect. Only one small metropolitan area was included in the study, potentially limiting generalizability.

Perception of Physical Environment

Perception of the environment and its supports seems to be just as influential on physical activity behavior as actual environmental supports. Addy and colleagues are among the few researchers to use multivariate analysis to assess the influence of environmental supports on physical activity as well as on walking behavior (4).

Telephone interviews were administered to a random sample of predominantly rural southeastern adults, aged 18 or older, to assess demographic characteristics, social and physical environmental perceptions, and physical activity and walking behavior. Items addressed in the interview included perceived supports and barriers for physical activity in the neighborhood as well as the community. Neighborhood was defined as a 0.5 mile radius or 10 minute walk from the subject's home. Community was defined as a 10 mile radius or 20 minute drive from the respondent's home. Respondents were classified as either active, insufficiently active, or inactive, as well as regular walkers, irregular walkers, or nonwalkers, based on the 2001 Behavioral Risk Factor Surveillance System (BRFSS) physical activity module. Results of multivariate analysis revealed that younger age, better street lighting, trust of neighbors, and use of private recreation facilities, parks, playgrounds, sports fields, schools, and worship facilities were all associated with increased physical activity. Increased walking behaviors were seen with younger age, more education, having physically active neighbors, having sidewalks available in the neighborhood, and using a mall for walking. Neighborhood variables seemed to have a stronger influence on physical activity than community variables, overall. This study indicates that perceived social and physical environmental supports are positively associated with physical activity and walking behavior. Causal inferences for physical activity cannot be made from this cross-sectional study.

Brownson and colleagues also looked at the perceived environment as determinants of physical activity but oversampled individuals at lower income levels (5). A random-digit dialing technique was used to collect data with a modified version of the BRFSS being used in the phone interviews. US adults living in zip code areas where

32% or more of residents were below the poverty line were oversampled in order to get a representative sample of lower income individuals. Physical activity behavior was grouped into three categories: (1) moderate or vigorous activity, (2) insufficient activity, or (3) inactive. Age, sex, race/ethnicity, household income, and education level were the variables used in the final modeling process. Individuals with incomes below \$20,000 per year represented 40% of the study population. Most access variables tested had a positive association with physical activity. Women with higher income levels reported greater access to places for physical activity, such as walking or jogging trails, parks, and treadmills, while men with lower incomes reported more access than higher income men. Heavy traffic was reported more for lower income subjects. The most common places people of both income levels engaged in physical activity were: on neighborhood streets (66.1%), at shopping malls (37%), at parks (29.6%), on a walking and jogging trail (24.8%), on a treadmill (24.7%), and at an indoor gym (21.3%). There was a linear relationship between physical activity and access to parks (adjusted OR=1.95, 95% CI=1.52, 2.52), indoor gyms (adjusted OR=1.94, 95% CI=1.45, 2.60), and treadmills (adjusted OR=1.48, 95% CI=1.13, 1.93) for both income groups. Also associated with physical activity were presence of sidewalks, enjoyable scenery, heavy traffic, and hills. Heavy traffic and hills may seem contradictory but heavy traffic may correlate with higher levels of physical activity in urban versus rural neighborhoods while hilly areas may relate to more scenic areas. Presence of sidewalks was the most influential variable among higher income individuals, while enjoyable scenery was most influential among those with lower incomes. Neighborhood crime was also investigated because it has been suggested that there may be a direct relationship between perceived safety and physical

activity. Low income groups reported 40% more exposure to high rates of crime. While a mild inverse relationship was found between neighborhood crime and physical activity, it was not statistically significant.

Socioeconomic Status

Two other studies investigated socioeconomic status (SES) to determine if differences in the number of recreational opportunities were present between high and low socioeconomic status neighborhoods and if that was a predictor for physical activity behavior. Estabrooks and colleagues looked at access to physical activity opportunities between neighborhoods of varying SES (6). They studied a small U.S. city (population = 133,046) and found that high-SES neighborhoods had significantly greater physical activity resources (M=8.4-/+3.5) than low-SES (M=4.5-/+2.3) and medium-SES (M=4.9-/+2.6), ($p<.05$) neighborhoods. The neighborhoods did not differ in the number of pay-for-use facilities but high-SES neighborhoods had significantly more free-for-use resources (M=6.1-/+2.4) than low-SES (M=3.1-/+1.5) and medium-SES (M=3.8-/+1.6) neighborhoods ($p<.01$). Most research is consistent with these findings on SES and physical activity resources but a study in Australia showed opposite results. Giles-Corti et al. found that subjects with lower SES reported more physical activity opportunities than those of higher SES (7). This could have been influenced by the fact that the town studied had a high standard of living, by national and international standards, and this could have affected generalizability.

Wilson and colleagues not only looked at access to physical activity resources between SES groups, but at physical activity outcome as well (8). The study was conducted in a U.S. southeastern county. SES was determined by median household

income and owner-occupied houses. Ten census tracts represented low SES and 11 census tracts represented high SES. Trails, sidewalks, public recreation facilities, and violent crime incidents were objectively measured using a Geographic Information System (GIS). Participants from low-SES areas reported participating in less physical activity and had higher perceptions of neighborhood crime, unattended dogs, unpleasantness of neighborhoods, untrustworthy neighbors, and less access to public recreation facilities ($p < .05$). Objective measures, using the GIS, showed a difference in the number of trails between SES groups, but no differences in presence of sidewalks, recreation facilities, and crime rates. High SES areas had a greater number of trails. Trail accessibility and use was a predictor of sufficient physical activity for low-SES respondents ($p < .05$). According to the study, people who live in low SES neighborhoods may not only have fewer physical activity resources but perceive they have fewer resources as well. This class is the most vulnerable for overweight which could partly be due to the barriers they face in engaging in physical activity along with other neighborhood characteristics that promote weight gain such as high densities of fast-food restaurants, convenience stores, and bars (9).

Dietary Intake

Dietary habits have been shown to be associated with physical activity and with proximity to grocery stores. Americans living in neighborhoods with supermarkets have been shown to have healthier diets in terms of fruits and vegetables, total fat, and saturated fat. Location of food stores and food service places in neighborhoods could be associated with dietary intake in children, adults, and older adults. There is limited research on proximity to healthy food and dietary patterns. Moreland and colleagues

looked at the distribution of food stores and food service places by neighborhood wealth and racial segregation (9). Neighborhoods in Mississippi, North Carolina, Maryland, and Minnesota were studied and local departments of environmental health and state departments of agriculture supplied names and addresses of places to buy food in these neighborhoods. Neighborhood wealth was estimated using median house value while neighborhood racial segregation was measured by the proportion of black residents. The lowest wealth group had the highest population density with eight times as many black Americans. As the wealth of the neighborhoods increased, the proportion of supermarkets increased, with wealthier neighborhoods having over 3 times as many supermarkets than the lowest-wealth areas. Medium-wealth neighborhoods had the highest prevalence of convenience stores with gas stations. Lower-wealth neighborhoods had more small grocery stores, convenience stores (without gas stations), and specialty stores. Fast-food restaurants, bars, and taverns were also more concentrated in lower SES neighborhoods. In terms of racial segregation, supermarkets were 4 times more common in predominately white neighborhoods compared to predominately black neighborhoods, which had more small grocery stores, convenience stores, and convenience stores attached to gas stations. Food service places were mainly found in racially mixed and predominately white neighborhoods with the exception of bars and taverns. The linear relationship seen between wealth and number of supermarkets supports previous research of this association and influences future research investigating the association between dietary choices and availability of food stores and food service places.

Diez-Roux et al examined neighborhood income as a predictor of dietary patterns, independent of individual income (10). 1990 census tracts from Maryland, North

Carolina, Mississippi, and Minnesota were used to establish neighborhoods and the local food environment was defined by the number and types of food stores and food service places within the census tract where a participant lived. While residents of lower income neighborhoods consumed less fruits, vegetables, and fish, and more meat than those living in higher income neighborhoods, individual level income was generally a better predictor of diet than neighborhood income. It is not known whether the lack of availability of healthy foods in lower income neighborhoods is directly related to poorer dietary choices but a strong relationship exists between the two, suggesting that SES and access to healthy foods interact in impacting dietary choices.

Summary

Availability of recreational facilities and resources (such as walking/bicycling trails, parks, and playgrounds), density and land use mix of area, and socio-economic status of neighborhood all seem to play a role in either facilitating or hindering physical activity and dietary intake. According to the literature, two of the most common areas for energy expenditure are neighborhood streets and parks, while the specific physical environment characteristics that have the greatest potential to influence physical activity have yet to be determined. These individual characteristics need to be defined to impact public policy decisions about the built environment for future city planning. This study will address the gaps in current scientific knowledge with the development of more consistent methods in evaluating the link between neighborhood of residence and obesity risk. This study will include objective measures of the physical environment, physical activity, and body composition with direct observation of the neighborhood, pedometers, and body composition analysis via dual-energy X-ray absorptiometry.

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Neighborhood Influences on Diet and Physical Activity

Chapter 3:

Introduction

Prevalence of health conditions such as cardiovascular disease, type 2 diabetes, hypertension, metabolic syndrome, and many cancers has increased the last twenty years. Researchers agree that these health conditions are closely linked to the rising number of individuals who are overweight or obese. With nutrition education showing limited impact on reversing this epidemic, increasing physical activity has become a major focus of health professionals. Physical activity is not only known to reduce the risk of developing high blood pressure, colon cancer, diabetes, and cardiovascular disease but is associated with a healthier diet as well (1).

Of the many underlying factors that influence physical activity, environmental variables have the biggest impact on communities as a whole, affecting a wide range of individuals. For this reason, creating a physical environment that promotes physical activity will have the greatest benefit in terms of affecting the largest number of people. Defining the variables of the physical environment that have the largest effect on influencing individuals to participate in regular activity is difficult (2). Variables that have been studied include: general walkability, level of perceived safety in the neighborhood, traffic (heavy or not), presence of walking/bicycling trails, distance to trails, length of trails, presence of sidewalks, presence of parks, presence of green/open space, presence of shops within walking distance, overall number of recreational facilities present, frequency of seeing others exercising, street connectivity, and land-use mix (2).

While there seems to be at least a weak association between all individual variables and physical activity, results have been inconsistent across studies.

Humpel et al. reviewed 19 quantitative studies on physical environment attributes and physical activity behavior and found accessibility, opportunities, and aesthetics to have the most significant associations with physical activity (2). Powell and colleagues also studied access to safe and convenient places for walking and its association with physical activity behaviors (3). According to their results, an increase in convenience to walking place increases the likelihood of meeting current activity recommendations. Making walking accessible and convenient to all communities may have a large affect on America's physical activity levels; walking is the most commonly reported physical activity behavior and the easiest to influence in sedentary people (4).

Saelens and colleagues divided neighborhoods into two categories, high or low walkability, and compared weight status and physical activity to determine if either had a significant impact on physical activity behavior. The high walkability neighborhood reported higher residential density, land use mix-diversity, land use mix-access, street connectivity, aesthetics, and pedestrian/automobile traffic safety. Residents of this high walkability neighborhood engaged in more moderate-intensity physical activity, by 52 minutes, and had lower BMI's than residents of the low walkability neighborhood (25.3 vs. 27.4, $p = .051$).

Socioeconomic status is another factor that seems to play a role in physical activity behavior. Estabrooks and colleagues looked at access to physical activity opportunities between neighborhoods of varying SES (5). High SES neighborhoods had significantly more free-for-use resources than low SES. Participants from low-SES areas

reported participating in less physical activity and having more barriers to overcome. Increasing physical activity opportunities for low SES neighborhoods is important due to the large number of overweight people in this population.

Dietary habits are also influenced by neighborhood variables. For example, the presence of a grocery store increases the percent of people in that neighborhood meeting dietary recommendations (6). Physical activity is also associated with dietary behaviors. Individuals who regularly engage in physical activity report having healthier diets than inactive individuals (7). Comparing physical activity levels between high and low income groups within the same neighborhood has not been previously studied, and therefore, this study will help add to the literature on neighborhood influences of physical activity and differences in income level.

Thus, the purpose of this study was to determine if differences in physical activity and use of neighborhood facilities varied between high and low income groups. The study also examined neighborhood differences, such as distance from the park and living on a street with a hill, to determine if they influenced park use.

METHODS

STUDY DESIGN

A cross-sectional study was conducted to compare physical activity level, body composition, use of neighborhood recreational opportunities, perception of neighborhood friendliness toward physical activity, and dietary intake among lower and higher income people living in the same neighborhood; the neighborhood was selected based on its physical environment: diversity in housing types as well as income, and presence of favorable built environment (park, trails, close proximity to a grocery store), to determine if differences exist in neighborhood use for physical activity by income group.

PARTICIPANTS

Residents of the Nellie's Cave Park neighborhood were recruited to participate in the study. To be eligible, potential subjects must live within walking distance (defined as 0.75 mile without crossing a major road) from Nellie's Cave Park; be considered an adult (aged 18 or older), and free from any existing condition or illness that prevents them from walking. The Montgomery County tax assessor's office GIS database was used to locate addresses closest to the park as well as housing costs to insure an even sample of different income groups. Approximately 400 postcards were sent out to both high and low-income residents within the neighborhood to influence participation in the study. Additional recruitment was conducted with follow-up phone calls and flyers distributed in person. Incentives for participation were a monetary gift card (\$20) to a local supermarket, a free pedometer, and health screening information. Prior to participation,

all participants received and signed an informed consent form (Appendix A) detailing the responsibilities and risks involved with the study. The protocol was approved by the Institutional Review Board at Virginia Tech (Appendix G).

DEMOGRAPHIC INFORMATION

Demographic information was obtained from self-administered questionnaires and included gender, age, race, ethnicity, and income. Subjects who reported earning less than \$50,000 annually were grouped in the low income category while those earning \$50,000 or more were considered high income.

SELF-EFFICACY

An evaluation of self-efficacy for physical activity was also included due to its strong association with physical activity (8-10). Self-efficacy was measured using the method of Marcus *et al* (8), shown to be reliable in an adult population. These five questions, with answers on an 11-point scale, assess how likely it is a person will still exercise based on typical daily obstacles such as bad weather, time constraints, and temperament.

PHYSICAL ACTIVITY ASSESSMENT

Physical activity was measured both objectively and by self-report. Participants were given a pedometer (Sportline 350, Hazleton, PA) and instructed to wear it for 7 consecutive days, recording daily step count in a log. While pedometers are not as accurate as accelerometers and heart rate monitors for measuring physical activity, they are considered valid measures for epidemiological research (11-14). Seven days of

pedometer use was chosen for its reliability in estimating usual physical activity behavior in both children (15) and adults (16). Pedometers have several limitations including: a decline in accuracy in obese and overweight individuals as well as the elderly (17); undercounts steps at slower walking speeds; and cannot distinguish between walking and other non-walking activities, limiting its accuracy for quantifying energy expenditure. Nevertheless, pedometers are effective for distinguishing between groups that differ in their level of walking and provide useful information on the number of steps accumulated per day (12).

To supplement pedometer use, subjects also completed a 7-day self-report activity log. The participants were given instructions to record all morning, daytime, and evening activities, giving details of the exercise, minutes performed, and whether it was light, moderate, or vigorous physical activity. The activity logs were useful in documenting activities that pedometers cannot count such as duration, intensity, and type of activity performed. Self-report is limited in its accuracy to estimate absolute amounts of physical activity due to response rates, extent to which participants follow instructions, and common over-reporting of physical activity (18). Self-report was used to assess the context and type of physical activities in combination with objective measures to estimate absolute amounts of physical activity. Step counts were used to validate relative activity level.

Location of physical activity performed was also established to help determine if neighborhood facilities are used and if there are differences between income groups and neighborhood use for physical activity.

ASSESSMENT OF DIETARY INTAKE

Dietary intake was measured to determine potential association with physical activity. Dietary intake focused on servings of fruits and vegetables per day, servings of low-fat dairy products per day, grams of dietary fiber per day, and percent of kilocalories from fat, all of which are associated with proximity to a supermarket and risk of obesity (19, 20-24). While it has been shown that diet is associated with physical activity (1), it is possible this association is influenced by specific recreational opportunities.

Diet was measured with the Block 98 Dietary Questionnaire (25). Participants completed this food frequency questionnaire during their scheduled appointment to have body composition measurements taken. The questionnaire is useful in assessing an individual's habitual intake of foods and nutrients and is considered reliable and valid when compared with multiple 24-hr recalls or biomarkers of nutrient intake; however, the instrument typically underestimates absolute intake (25-27).

ASSESSMENT OF BODY COMPOSITION

Body composition of subjects was objectively measured using bone mineral density via dual-energy X-ray absorptiometry (DEXA) due to its close relationship with physical activity and overall health. This method was used to assess abdominal obesity, intra-abdominal fat, risk of obesity-related chronic disease, bone density and percent body fat. Weight was measured to the nearest 0.25 pound with a calibrated digital scale (Scaletronix). Height was measured to the nearest 0.25 inch with a wall-mounted stadiometer (Heightronix). BMI is the most commonly used adiposity index for adults and is the ratio of body weight in kilograms to height in square meters (28-31). It is easy

to obtain and is a good indicator of fat mass and risk of chronic disease, yet it is not a direct measure of body composition and cannot distinguish between lean mass and fat mass.

DEXA is a minimally invasive assessment of fat mass and is considered a reliable and valid method of determining body composition (29). DEXA estimates of trunk and abdominal fat mass have shown strong correlations to total abdominal fat and abdominal visceral fat (32-34). This instrument is ideal for measuring body composition for its ability to recognize changes in lean mass and fat mass with no change in body weight (30-31). DEXA also measures bone mineral density which is strongly associated with physical activity (35-37).

ASSESSMENT OF PHYSICAL ENVIRONMENT

Subjects' perception of their physical environment, as related to friendliness towards physical activity, was evaluated due to the associations between actual energy expenditure and perception of opportunities for exercise. Participants completed the Neighborhood Environment Walkability Survey (NEWS), developed by Sallis *et al* (38), which is a 98-question instrument that examines social cohesion and neighborhood design features hypothesized to be connected with physical activity. The questionnaire includes questions about types of residences (to assess density), proximity of stores and facilities in the neighborhood, perceived access to these places, street characteristics (to assess connectivity), facilities for walking and cycling, consistent use of these facilities, neighborhood aesthetics, and safety regarding traffic and crime. NEWS was used due to its test-retest reliability (38).

Physical environment data were objectively measured using the town GIS database to select a neighborhood that contained recreational facilities including a park. The park was observed to have a walking trail, soccer field, baseball diamond, sheltered picnic area, Arboretum, basketball court, playground, horseshoe pits, tennis courts and a swimming pool. Participants' distance from the park was objectively measured using GPS (Magellan Map 330, Santa Clara, CA).

DATA ANALYSIS

DESCRIPTIVE ANALYSIS

Characteristics used to describe the study population include: age, race, gender, BMI, income, and whether they owned or rented their home/apartment. Participants' NEWS scores, HEI scores, exercise in steps and minutes, and reasons they chose to live in this neighborhood were also used to illustrate the study population. Percent of calories from saturated fat, daily servings of fruit/vegetables combined, daily servings of milk/dairy, daily servings of whole grains, and daily grams of dietary fiber and were described using means and standard deviations.

STATISTICAL ANALYSIS

All analyses were performed with SPSS (version 14.0, 2005; Chicago IL). For all analyses, statistical significance was set at $p < 0.05$. Chi square analysis was used to evaluate associations between income and whether subjects exercised in the neighborhood (or, used neighborhood facilities for physical activity). An independent t-test with daily minutes of moderate/vigorous activity as the dependent variable was used to examine the association between income (high or low) and physical activity. Age was evaluated as a potential confounding variable using Univariate Analysis of Variance (ANOVA). NEWS score and self-efficacy were analyzed using t-tests to determine if income level (low, high) affects perception of the neighborhood or self-efficacy for physical activity.

Distance between residence and park (measured in hundredths of a mile) was used to determine associations between distance from the park and minutes of physical activity, location of exercise, self-efficacy for physical activity, and perception of

neighborhood friendliness towards physical activity (NEWS). An independent t-test was run to determine associations between distance from the park and location of exercise (separate analyses for exercise within the neighborhood, outside of the neighborhood, in their home, or at a pay-for-use gym). Self-efficacy, minutes of moderate/vigorous activity, and NEWS score were analyzed by distance from park using Pearson Correlation Coefficient.

Associations between living on a street with a hill (yes or no) and minutes of daily activity, self-efficacy towards physical activity, and perception of neighborhood friendliness towards physical activity (NEWS) were analyzed using independent t-tests. Chi-square analysis was used to determine associations between living on a street with a hill and where a person exercised.

Relationships between age and self-efficacy for physical activity and age and minutes of daily activity were analyzed using multiple linear regression. Significant associations found between variables were then analyzed by Pearson's Correlation (two sided). Associations between age and where a person exercises were analyzed with a t-test. Pearson's Correlation (two sided) was used to determine associations between age and perception of neighborhood friendliness towards physical activity (NEWS). To determine if age was a potential confounding variable in significant associations, more analysis was done; age and whether a person owns or rents their home/apartment was analyzed by Chi square, age and distance from park was analyzed with Pearson's Correlation (two sided), age and income were analyzed by ANOVA.

RESULTS

STUDY SAMPLE

Eighty-three residents of the Nellie's Cave Park neighborhood volunteered for the study. Of the 83 volunteers, 76 residents completed all surveys and instruments included in the study to be used for the current analysis. Characteristics of the sample are summarized in Table 1. The average of age of participants was 44.5 years and ranged from 19 to 85 years of age. Participants averaged 44 ± 43 minutes of daily moderate to vigorous physical activity and 8480 ± 3629 steps per day. A little over half of the study sample (54%) was classified as either overweight or obese based on BMI ($BMI > 25$) although the average BMI of subjects was just above the cut-off at 25.8 ± 4.4 . BMI was positively correlated with percent body fat ($p < 0.05$).

CORRELATIONS WITH AGE

Older residents (mean age 53 ± 18) earned higher incomes ($\geq \$50,000$) than their younger counterparts (mean age 37 ± 13 , $< \$50,000$) ($p < 0.05$). The mean age of participants owning their home or apartment was greater (49 ± 17) than participants renting (35 ± 16) ($p < 0.05$). Age was positively correlated with minutes of daily moderate to vigorous physical activity ($r(72) = .351$, $p < 0.05$). There was no significant relationship between age and self-efficacy towards physical activity, although there was a slight negative correlation ($r(75) = -.089$, $p = .444$). While there was a positive correlation between age and distance from park ($r(71) = .386$, $p < 0.05$), there was no significant relationship between age and where residents participate in physical activity.

Table 1: Characteristics of sample population

Age	44.5 ± 18	Range 19-85
	n (%)	
Gender		
Male	26 (32.5%)	
Female	52 (65%)	
Race		
White	74 (92.5%)	
African American	2 (2.5%)	
Asian	2 (2.5%)	
Income		
<\$20,000	14 (17.5%)	
\$20,000-\$34,999	15 (18.8%)	
\$35,000-\$49,999	7 (8.8%)	
\$50,000-\$100,000	28 (35%)	
>\$100,000	13 (16.3%)	
BMI		
Underweight (BMI < 18.5%)	2 (1%)	
Normal (18.5-24.9)	35 (45%)	
Overweight (25-29.9)	32 (41%)	
Obese (> 30)	10 (13%)	
Own/Rent		
Own	50 (62.5%)	
Rent	27 (33.8%)	

A negative correlation did exist between age and neighborhood perception of friendliness towards physical activity (NEWS) ($r(76) = -.342, p < 0.05$).

INCOME

Subjects were evenly distributed between those classified as low income (44% at < \$50,000) and those described as high income (56% at > \$50,000). Ninety-two percent of high income participants owned their homes/apartments, while 22% of low income residents were home/apartment owners. A significant difference existed between high and low income groups for daily minutes of moderate to vigorous physical activity ($t(71)$

= -2.16, $p < 0.05$). The mean of the high income group (54 min. \pm 50 min.) was significantly higher than the mean of the low income group (33 min. \pm 32 min). This comparison was no longer significant when controlling for age with a Univariate Analysis of Variance (ANOVA), indicating age as a stronger predictor of minutes of physical activity. Residents in the high income group had higher perceptions of neighborhood friendliness towards physical activity (NEWS) (241 \pm 26) than residents of the low income group (238 \pm 27), but the differences were not significant ($t(71) = -.664$, $p = .51$). On the other hand, low income residents reported higher self-efficacy towards physical activity (33.1 \pm 11) than high income residents (31.6 \pm 12), but once again, the differences were not significant ($t(71) = .575$, $p = .57$). Chi square tests of independence were calculated comparing income to where a person exercises (within neighborhood, outside neighborhood, gym), yet no significant relationship was found indicating these to be independent events.

DISTANCE FROM PARK

Residents' distance from the park was objectively measured with GPS measurements, to the hundredth of a mile, to evaluate its association with physical activity and where a person chooses to exercise. No significant relationship existed between distance from park and daily minutes of moderate to vigorous physical activity. While analyses showed that those residents living farther away from the park (.30 mile \pm .18 mile) exercised slightly more within their own neighborhood than those living closer to the park (.27 mile \pm .10 mile), there were no significant relationships between distance from park and where a person chose to exercise ($t(71) = -.916$, $p = .36$). Distance from

park was also not significantly correlated with self-efficacy towards physical activity or NEWS.

LIVING ON A STREET WITH A HILL

Participants living on a street with a hill accumulated more daily minutes of moderate to vigorous physical activity (47 min. \pm 36 min) compared to those participants not living on a hill (34 min. \pm 43 min.) ($t(66) = -1.32, p = .19$). NEWS score was inversely related to living on a hill; those not living on a hill reported higher perceptions of neighborhood friendliness towards physical activity (249 ± 27) than those residents on a street with a hill (230 ± 24) ($t(69) = 3.05, p < 0.05$). Self-efficacy was significantly related to living on a hill, yet those participants living on a hill reported higher self-efficacy towards physical activity (35 ± 12) than those subjects not living on a hill (29 ± 9) ($t(66) = -2.34, p < 0.05$). Living on a street with a hill did not influence where a person exercised, whether in their own neighborhood or outside their neighborhood.

PHYSICAL ACTIVITY

Mean minutes of exercise did not differ based on where the subjects exercised (in the neighborhood, outside of neighborhood, at the gym) according to independent t-test analysis, controlling for those who reported not exercising regularly. Subjects' attitude towards physical activity and their reasons for choosing the neighborhood they currently live in are described in Table 2 and Table 3. There was a significant positive correlation between minutes of moderate/vigorous activity and self-efficacy towards physical activity ($\rho = .410, p < 0.05$). A negative correlation was seen with minutes of moderate/vigorous exercise and subjects' perception of neighborhood friendliness towards physical activity (NEWS) ($\rho = -.236, p < 0.05$).

Table 2: Attitude towards physical activity

	<i>Low Income n(%)</i>	<i>High Income n(%)</i>	<i>Total n(%)</i>
<i>Very unfavorable</i>	<i>1(2.8%)</i>	<i>0(0%)</i>	<i>1(1.3%)</i>
<i>Somewhat unfavorable</i>	<i>1(2.8%)</i>	<i>0(0%)</i>	<i>1(1.3%)</i>
<i>Unsure</i>	<i>2(5.6%)</i>	<i>1(2.4%)</i>	<i>3(3.8%)</i>
<i>Somewhat favorable</i>	<i>7(19.4%)</i>	<i>7(17.1%)</i>	<i>14(17.5%)</i>
<i>Very favorable</i>	<i>24(66.7%)</i>	<i>31(75.6%)</i>	<i>56(70%)</i>

Independent t-test, $p < 0.05$

Table 3: Reasons for choosing the neighborhood

	<i>Low Income Mean ± SD</i>	<i>High Income Mean ± SD</i>	<i>Total Mean ± SD</i>
Park	4.97 ± 3.8	3.80 ± 3.8	4.38 ± 3.8
Recreational Facilities	3.11 ± 3.6	2.68 ± 3.7	2.88 ± 3.6
Sidewalks	4.71 ± 3.8	4.10 ± 3.9	4.39 ± 3.8
Walk to Grocery Store	4.57 ± 3.6	3.02 ± 3.5	3.69 ± 3.6
Walk to School	3.09 ± 4.11	1.54 ± 2.8	2.21 ± 3.5
Walking/biking trail	4.77 ± 4.0	4.51 ± 3.7	4.57 ± 3.8
Friendly towards physical activity	5.69 ± 3.8	6.07 ± 3.4	5.94 ± 3.6
Safe for physical activity	7.03 ± 3.2	7.07 ± 3.6	7.08 ± 3.4

Rating on a scale from 0 to 10, 10 being most important
Independent t-test, $p < 0.05$

A multiple linear regression indicated a weak correlation between NEWS and self-efficacy ($\rho = -.104$, $p > 0.05$) but this was not significant and therefore, NEWS cannot be used to predict self-efficacy. Subjects' dietary intake (HEI) was significantly

positively correlated with minutes of daily activity ($\rho = .242, p < 0.05$). Participants' dietary intake, based on their HEI score, is summarized in Table 4. Home owners exercised significantly more than renters (54 min. \pm 47 min. vs. 27 min. \pm 29 min., $p < 0.05$).

Table 4: Dietary Intake and HEI score

	<i>Low Income Mean \pm SD</i>	<i>High Income Mean \pm SD</i>	<i>Total Mean \pm SD</i>
HEI score*	68.46 \pm 12.6	67.24 \pm 10.6	68 \pm 12
Fiber	20.1 \pm 9.5	22.1 \pm 9.0	21.1 \pm 9.2
FatKcalPerc	34.6 \pm 6.7	38.1 \pm 6.2	36.2 \pm 6.6
Servings of fruits & Veggies	5.7 \pm 3.5	6.5 \pm 4.1	6.0 \pm 3.7
Dairy Servings	1.6 \pm 1.2	1.6 \pm 1.1	1.6 \pm 1.1
Grain Servings	5.3 \pm 2.8	4.1 \pm 1.9	4.7 \pm 2.5
Sodium	2744 \pm 1279	2553 \pm 1051	2649 \pm 1165

*Healthy Eating Index, scale of 0-100
Independent t-test, $p < 0.05$

DISCUSSION

The main finding from this study was that income did not influence daily physical activity. Previous studies report insufficient physical activity for those of low SES but this is typically in conjuncture with fewer reported public recreational facilities than those of high SES (39). The present study looked at both low and high income groups within the same neighborhood, having access to the same neighborhood recreational facilities and found no significant difference in daily minutes of moderate to vigorous physical activity. Participants earning higher incomes did exercise slightly more but this was mostly associated with their older age status, which had a significant positive correlation with physical activity. Also, income level did not seem to influence where the subjects exercised, if they used the free resources within walking distance in their own neighborhood or chose other options for physical activity. Subjects of both income levels exercised as much in their own neighborhood as they did in their home or at the gym or outside of their neighborhood. Furthermore, income did not influence one's perception of their neighborhood, in terms of favoring physical activity, as seen in the previous literature by Brownson et al. (39) and Wilson et al. (40). One possible reason for a lack of differences between income groups is the make-up of the town in which the study took place. Residents may be, on average, more physically active than the national average, and college students make up the bulk of the population. College/graduate students fit the cut-off for low income but this is most likely a transient phase and therefore, they do not truly represent low income. Also, this study split high and low income at above or

below \$50,000, well above the cut-off seen in previous studies for low-income at \$20,000 (39).

Living on a street with a hill did not influence daily minutes of energy expenditure, but was influential in self-efficacy for physical activity as well as perceptions of neighborhood friendliness towards physical activity. As seen in a previous study, hills were associated with greater self-efficacy towards physical activity which was suggested to be associated with more scenery, making exercise more enjoyable (39). Although, those subjects living on a street with a hill did not perceive their neighborhood to be as accommodating to physical activity according to their NEWS scores.

Residents' distance from the park did not play a role in the amount of physical activity accumulated or where one chose to be active. All subjects lived within walking distance to the park (.75 mile) and while a greater number of participants exercised within their neighborhood, it was pretty evenly distributed with those exercising outside of their neighborhood, including the gym or inside their home. College students and faculty at the university have free access to gym facilities and trails while on campus which could influence where one exercises and not that they necessarily pay to exercise outside of their neighborhood.

The most reported reasons for why residents chose where they live, related to physical activity, were that it is safe for physical activity and that it is friendly towards physical activity. This is in accordance with the participants' attitude towards physical activity, with 88% of viewing physical activity favorably. Presence of sidewalks, proximity to a park, and presence of a walk/bike path were of somewhat importance (average of 4.5 on a 10-point scale) in their decision while walking distance to a school

or grocery store were of least importance. This is most likely due to the fact that residents would have to walk 15-20 minutes and cross a major highway to arrive at the grocery store or school.

Participants' dietary intake, based on their Healthy Eating Index score was positively correlated with daily minutes of physical activity. This is consistent with the literature, which suggests physical activity is associated with a healthier diet (6). The mean HEI score of subjects was 68, slightly better than the national average of 63.8, according to the 1999-2000 USDA report, but still classified as "needs improvement" in meeting the federal dietary guidelines for nutrition. Participants fell just short of recommendations for fiber (21g vs. 25g), fruits and vegetables (6 servings vs 9 servings), dairy (1.6 servings vs. 3), and servings of grains (5 vs. 6-11). A majority of these shortcomings could be explained by the underreporting of food intake associated with food frequency questionnaires.

In conclusion, income level did not play a role in predicting minutes of daily physical activity or use of neighborhood recreational facilities. No neighborhood variables were found to influence energy expenditure although living on a hill increased self-efficacy for physical activity. Age was the biggest predictor of physical activity in this study sample.

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Chapter 4:

SUMMARY

This study found that residents of the Nellie's Cave Park neighborhood met current recommendations for physical activity (according to CDC guidelines), independent of income. The biggest predictor of physical activity in this population was age while the major predictor of self-efficacy for physical activity was living on a street with a hill.

Limitations to this study include the small sample size, which made it difficult to establish significance; the town in which the study took place, an atypical college town in which most residents are consistently active and students make up the bulk of residents classified as low income; and the sample population itself, which was not representative of the general public (mostly Caucasian, female). In addition, recruitment for the study was marketed towards learning more about one's diet and health status and therefore, attracted mostly physically active, health conscious individuals.

The findings of this study supplement previous research, indicating that access to locations and facilities where people can be physically active (walking trails, park) is positively correlated with physical activity behavior patterns in adults. Most residents, living within walking distance to a park and walking trail, were able to meet and/or exceed the current recommendations for physical activity for health, independent of their income level.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Increasing physical activity of Americans is necessary to control the rising number of diseases associated with being overweight. This study supports the current literature that access to recreational facilities such as walking/biking trails and parks is positively correlated with minutes of physical activity. This suggests establishing more recreational facilities in more neighborhoods, creating access to larger numbers of individuals and therefore, increasing the number of people participating in physical activity. Physical activity is not only a helpful tool in weight management but is known to help control weight related diseases such as diabetes. With over a quarter of Americans not participating in sufficient amounts of physical activity (40), increasing their opportunities (with parks and trails) for exercise may be beneficial in lowering the rates of weight related diseases. This is true also because most people report exercising in their own neighborhood and walking is reported as the number one means of exercise (4).

The primary finding that income did not influence daily minutes of physical activity within the neighborhood and that most residents, independent of income, met the recommendations for daily minutes of physical activity, suggests that more recreational facilities should be established in lower income neighborhoods, which reportedly have fewer recreational facilities as a whole, to increase physical activity in this population. Researchers should identify true, low income neighborhoods to determine which neighborhood characteristics have the most influence on physical activity in this population and if building more recreational facilities is justified.

APPENDICES

Appendix A: Medical Screening Form

NEIGHBORHOOD INFLUENCES ON DIET AND PHYSICAL ACTIVITY

Medical Screening Form and General Information (Adults)

Code Number: _____

Date: _____

Medical History

Please indicate any current or previous conditions or problems you have experienced or have been told by a physician that you have had:

	Yes	No
Heart disease or heart problems:	_____	_____
Circulation problems:	_____	_____
Kidney disease or problems:	_____	_____
Urinary problems:	_____	_____
Reproductive problems:	_____	_____
Muscle problems:	_____	_____
Skeletal problems:	_____	_____
Neurological problems/disorders:	_____	_____
High blood pressure:	_____	_____
Low blood pressure:	_____	_____
Diabetes:	_____	_____
Thyroid problems:	_____	_____
Eating disorders (bulimia, anorexia):	_____	_____
Crohn's disease:	_____	_____
Hirsutism (unusual hair growth on face or chest):	_____	_____
Insomnia:	_____	_____
Unusual sleep patterns:	_____	_____
Other (Please list): _____	_____	_____

If "yes" to any of the above please indicate the date, explain, and describe:

Please list any hospitalizations/operations/recent illnesses (Type/Date): _____

Work Schedule and Patterns

Do you engage in night-time work? YES NO

If yes, please explain: _____

Family Health History

Has anyone in your family (blood relatives only) been diagnosed or treated for any of the following?

	Yes	No	Relationship	Age
Kidney disease	_____	_____	_____	_____
Diabetes	_____	_____	_____	_____
Crohn's disease	_____	_____	_____	_____
Thyroid disorders	_____	_____	_____	_____
Osteoporosis	_____	_____	_____	_____
Osteopenia	_____	_____	_____	_____

Have you broken any bone(s)? Yes _____ No _____

If "yes," please list bone(s) and age(s) at time of break: _____

Are there any physical limitations you have that may restrict your ability to exercise? YES NO

If "yes" please explain: _____

For Women:

Are you pregnant or do you think that you may be pregnant? YES NO Not Applicable

****If you are pregnant or think that you may be pregnant, you should not participate in this study. This study involves DXA scans and exposure to radiation. Radiation exposure from DXA scans may cause harm to your unborn fetus; therefore, if you are pregnant or think that you may be pregnant, you should not participate in this study.**

Medications

Please indicate any current medications that you are taking on a daily or weekly basis:

	Yes	No
Steroids (such as Prednisone):	_____	_____
Thyroid medications (such as Synthroid):	_____	_____
Bisphosphonates (such as Fosamax):	_____	_____
Anticonvulsants (such as Dilantin):	_____	_____
Glucocorticoids (such as Dexamethasone):	_____	_____
Other bone medications (such as Miacalcin):	_____	_____
Anti-ADHD (such as Adderall)	_____	_____

Please list any nutritional supplements, herbal products, or other medications, (prescription and over-the-counter) you are currently taking on a daily or weekly basis: _____

Weight History

What is your current weight? _____

How much did you weigh six months ago? _____

How much did you weigh one year ago? _____

During the last 2 years, how many times have you lost 5 pounds? _____

During the last 2 years, how many times have you gained 5 pounds? _____

Smoking

Do you smoke cigarettes or cigars or use tobacco products (circle)? YES NO

-if yes, please indicate which tobacco product you use and how many times/day you use it:

Product:_____

Times/items per day: _____

Gender: Male Female **Age:** _____ **Date of Birth:** _____

Race:

____ White ____ Black/African American ____ Native American ____ Asian/Pacific Islander

____ Other: _____

Hispanic or Latino? ____ Yes ____ No

Family Annual Income

____ < \$20,000

____ \$20,000 – \$34,999

____ \$35,000 - \$49,999

____ \$50,000 - \$100,000

____ > \$100,000

Appendix B: Self-efficacy for Physical Activity Questionnaire

Self-Efficacy for Physical Activity

Please indicate how confident you are that you can be physically active in each of the following situations, using a scale from 1 to 11.

- 1 = Not at all confident
- 11 = Very confident
- 0 = Does not apply to me

On a scale from 1 to 11, I am confident I can participate in regular exercise when:

<i>Situation</i>	<i>Confidence Rating</i>
1. I am tired.....	_____
2. I am in a bad mood.....	_____
3. I feel I don't have the time.....	_____
4. I am on vacation.....	_____
5. It is raining or snowing.....	_____

Appendix C: Neighborhood Friendliness Toward Physical Activity Questionnaire

Neighborhood Environment Walkability Scale (NEWS)

We would like to find out more information about the way that you perceive or think about your neighborhood. Please answer the following questions about your neighborhood and yourself. Please answer as honestly and completely as possible and provide only one answer for each item. There are no right or wrong answers and your information is kept confidential.

A. Types of residences in your neighborhood

Among the residences in your neighborhood...

1. How common are detached single-family residences in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All
2. How common are townhouses or row houses of 1-3 stories in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All
3. How common are apartments or condos 1-3 stories in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All
4. How common are apartments or condos 4-6 stories in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All
5. How common are apartments or condos 7-12 stories in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All
6. How common are apartments or condos more than 13 stories in your immediate neighborhood?
1 2 3 4 5
None A few Some Most All

B. Stores, facilities, and other things in your neighborhood

About how long would it take to get from your home to the nearest businesses or facilities listed below if you walked to them? Please put only one check mark (✓) for each business or facility.

1-5 min 6-10 min 11-20 min 21-30 min 31+ min don't know

example: gas station 1. ____ 2. ____ 3. ✓ 4. ____ 5. ____ 8. ____

1. convenience/small 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____ grocery store

2. supermarket 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

3. hardware store 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

4. fruit/vegetable market 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

2

1-5 min 6-10 min 11-20 min 21-30 min 31+ min don't
know

5. laundry/dry cleaners 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

6. clothing store 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

7. post office 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

8. library 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

9. elementary school 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
10. other schools 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
11. book store 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
12. fast food restaurant 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
13. coffee place 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
14. bank/credit union 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
15. non-fast food
restaurant 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
16. video store 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
17. pharmacy/drug store 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
18. salon/barber shop 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
19. your job or school 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
- [check here ____ if do not have work away from home or do not attend school]
20. bus or trolley stop 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
21. park 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
22. recreation center 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____
23. gym or fitness facility 1. ____ 2. ____ 3. 4. ____ 5. ____ 8. ____

C. Access to services

Please circle the answer that best applies to you and your neighborhood. Both local and within walking distance mean within a 10-15 minute walk from your home.

1. I can do most of my shopping at local stores.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

2. Stores are within easy walking distance of my home.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

3. Parking is difficult in local shopping areas.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

4. There are many places to go within easy walking distance of my home.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

5. It is easy to walk to a transit stop (bus, train) from my home.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

6. The streets in my neighborhood are hilly, making my neighborhood difficult to walk in.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

7. There are many canyons/hillsides in my neighborhood that limit the number of routes for getting from place to place.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

D. Streets in my neighborhood

Please circle the answer that best applies to you and your neighborhood.

1. The streets in my neighborhood do not have many, or any, cul-de-sacs (dead-end streets).

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

2. There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

3. The distance between intersections in my neighborhood is usually short (100 yards or less; the length of a football field or less).

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

4. There are many four-way intersections in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

5. There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time.)

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

E. Places for walking and cycling

Please circle the answer that best applies to you and your neighborhood.

1. There are sidewalks on most of the streets in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

2. The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks).

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

3. There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

4. Sidewalks are separated from the road/traffic in my neighborhood by parked cars.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

5. There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

F. Neighborhood surroundings

Please circle the answer that best applies to you and your neighborhood

1. There are trees along the streets in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

2. Trees give shade for the sidewalks in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

3. There are many interesting things to look at while walking in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree 5

4. My neighborhood is generally free from litter.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

5. There are many attractive natural sights in my neighborhood (such as landscaping, views).

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

6. There are attractive buildings/homes in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly
disagree disagree agree agree

G. Safety from traffic

Please circle the answer that best applies to you and your neighborhood.

1. There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

2. There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

3. The speed of traffic on the street I live on is usually slow (30 mph or less).

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

4. The speed of traffic on most nearby streets is usually slow (30 mph or less).

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

5. Most drivers exceed the posted speed limits while driving in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

6. There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

7. The crosswalks in my neighborhood help walkers feel safe crossing busy streets.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

8. When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars, buses).

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

H. Safety from crime

Please circle the answer that best applies to you and your neighborhood.

1. My neighborhood streets are well lit at night.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

2. Walkers and bikers on the streets in my neighborhood can be easily seen by people in their homes.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

3. I see and speak to other people when I am walking in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

4. There is a high crime rate in my neighborhood.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

5. The crime rate in my neighborhood makes it unsafe to go on walks during the day.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

6. The crime rate in my neighborhood makes it unsafe to go on walks at night.

1 2 3 4

strongly somewhat somewhat strongly

disagree disagree agree agree

I. Neighborhood satisfaction

Below are things about your neighborhood with which you may or may not be satisfied. Using the 1-5 scale below, indicate your satisfaction with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. The 5-point scale is as follows:

1 = strongly dissatisfied

2 = somewhat dissatisfied

3 = neither satisfied nor dissatisfied

4 = somewhat satisfied

5 = strongly satisfied

How satisfied are you with...

(example) 3 the number of pedestrian cross-walks in your neighborhood ?

a. the highway access from your home?

b. the access to public transportation in your neighborhood?

c. your commuting time to work/school?

d. the access to shopping in your neighborhood?

e. how many friends you have in your neighborhood?

f. the number of people you know in your neighborhood?

g. how easy and pleasant it is to walk in your neighborhood?

h. how easy and pleasant it is to bicycle in your neighborhood?

i. the quality of schools in your neighborhood?

j. access to entertainment in your neighborhood (restaurants, movies, clubs, etc.)?

k. the safety from threat of crime in your neighborhood?

l. the amount and speed of traffic in your neighborhood?

m. the noise from traffic in my neighborhood?

n. the number and quality of food stores in your neighborhood?

o. the number and quality of restaurants in your neighborhood?

p. your neighborhood as a good place to raise children?

q. your neighborhood as a good place to live?

Appendix D: Anthropometric Measurement Data Collection Form

Anthropometric Data Collection Form

Pilot Study: Neighborhood Influences on Diet and Physical Activity

Subject Code Number: _____

Staff Member: _____

Date: _____

Time of day: _____ am / pm

Weight: _____ pounds

Height: _____ inches

Waist – narrowest point
(cm) _____

Waist – above suprailiac crest
(cm) _____

Hip (cm): _____

Abdomen _____

Subscapular skinfold: _____

Abdominal skinfold: _____

Suprailiac skinfold: _____

Appendix E: 7-Day Step Count Recording Form

7-Day Step-Count and Activity Log

Instructions

IMPORTANT: Do NOT change your normal physical activity routine because you are keeping this log.

To record the total number of steps showing on the step-counter:

- Wear your step counter everyday for 7 days.
- **DO NOT reset the step counter.**
- At the end of each day, record the total number of steps showing on the step counter.
- Write down the time of day that you recorded your steps (for example, 10:15 pm, 11:45 pm, etc.)
- If you reset your step counter by mistake, check the box on the log. Continue wearing the step counter and record the number of steps each day until the end of 7 days.

To record your morning, afternoon, and evening activity:

Record **any** physical activity comparable to how you feel when you are walking at a normal walking pace.

Morning = from the time you get up until you eat lunch.

Afternoon = from after lunch to dinner

Evening = after dinner until you go to bed

To record your stretching and strength training exercise:

Stretching exercises means exercises or yoga done by themselves or as part of an exercise or sports routine (like before or after an aerobics class or golfing)

Strength training is any type of strength exercises done to improve physical fitness. This includes push-ups, sit-ups, using weight machines, barbells, or dumbbells, using extra large rubber bands or tubing (dynabands).

Today's Date: _____

Day of the Week (Circle One): Mon Tue Wed Th Fri Sat Sun

1) Number of steps recorded on step counter: _____

Time of day recorded: _____

DO NOT reset the step counter. If you reset the step counter, check here:

Continue wearing the step counter and record your steps each day for 7 days.

2) How many total hours did you work in a paid or volunteer position today?

_____ (Number of hours worked)

3) How many total hours did you spent in bed in the last 24 hours (include time spent sleeping plus time reading or watching TV)?

_____ (Number of hours in bed)

4) How many total hours did you spent watching TV in the last 24 hours (include time spent watching TV in bed)?

_____ (Number of hours watching TV)

5) Were you physically active in the morning? Yes No (If no, go to #4)

Describe the Morning Activity	How Many Minutes?	How hard was it? (Check One)			
		Light	Moderate	Hard	Very Hard

6) Were you physically active in the afternoon? Yes No (If no, go to #5)

Describe Your Afternoon Activity	How Many Minutes?	How hard was it? (Check One)			
		Light	Moderate	Hard	Very Hard

7) Were you physically active in the evening? Yes No (If no, go to #6)

Describe Your Evening Activity	How Many Minutes?	How hard was it? (Check One)			
		Light	Moderate	Hard	Very Hard

8) Did you do any flexibility training (stretching or yoga) today? Yes No
(If no, go to #8)

Describe Your Flexibility Activity	How Many Minutes

9) Did you do any strength training today? Yes No (If no, go to #8)

Describe Your Strength Training Activity	How Many Minutes

10) Compared to your physical activity over the past three months, was today's physical activity more, less or about the same?

More active today. Less active today. About the same today.

Appendix F: Block 98 Dietary Questionnaire

RESPONDENT ID
NUMBER

TODAY'S DATE

FOOD QUESTIONNAIRE

<input type="checkbox"/>	Jan	DAY	YEAR
<input type="checkbox"/>	Feb		
<input type="checkbox"/>	Mar		1998
<input type="checkbox"/>	Apr		1999
<input type="checkbox"/>	May		2000
<input type="checkbox"/>	Jun		2001
<input type="checkbox"/>	Jul		2002
<input type="checkbox"/>	Aug		2003
<input type="checkbox"/>	Sep		2004
<input type="checkbox"/>	Oct		2005
<input type="checkbox"/>	Nov		2006
<input type="checkbox"/>	Dec		2007



This form is about the foods you usually eat.
It will take about 30 - 40 minutes to complete.

- Please answer each question as best you can. Estimate if you aren't sure.
- Use only a No. 2 pencil.
- Fill in the circles completely, and erase completely if you make any changes.

Please print your name in this box. _____

SEX

- Male
 Female

AGE

WEIGHT
pounds

HEIGHT
ft. in.

If female, are you
pregnant or
breast feeding?

- No
 Yes
 Not female

AVERAGE USE IN THE PAST YEAR

First, a few general questions
about what you eat.

LESS THAN ONCE per WEEK	1-2 per WEEK	3-4 per WEEK	5-6 per WEEK	1 per DAY	1 1/2 per DAY	2 per DAY	3 per DAY	4+ per DAY
-------------------------	--------------	--------------	--------------	-----------	---------------	-----------	-----------	------------

About how many servings of vegetables do you eat, per day or per week, not counting salad or potatoes?

About how many servings of fruit do you eat, not counting juices?

How often do you eat cold cereal?

How often do you use fat or oil in cooking?

What kinds of fat or oil do you usually use in cooking? MARK ONLY ONE OR TWO

- | | | |
|---|--|---|
| <input type="checkbox"/> Don't know, or Pam | <input type="checkbox"/> Butter/margarine blend | <input type="checkbox"/> Lard, fatback, bacon fat |
| <input type="checkbox"/> Stick margarine | <input type="checkbox"/> Low-fat margarine | <input type="checkbox"/> Crisco |
| <input type="checkbox"/> Soft tub margarine | <input type="checkbox"/> Corn oil, vegetable oil | |
| <input type="checkbox"/> Butter | <input type="checkbox"/> Olive oil or canola oil | |

237890

During the past year, have you taken any vitamins or minerals regularly, at least once a month?

- No, not regularly Yes, fairly regularly

(IF YES) WHAT DID YOU TAKE FAIRLY REGULARLY?

VITAMIN TYPE	HOW OFTEN					FOR HOW MANY YEARS?					
	A FEW DAYS	1-3 DAYS	4-6 DAYS	EVERY DAY	LESS THAN 1 YR.	1 YEAR	2 YEARS	3-4 YEARS	5-9 YEARS	10+ YEARS	
	DIDN'T TAKE	per MONTH	per WEEK	per WEEK	EVERY DAY	LESS THAN 1 YR.	1 YEAR	2 YEARS	3-4 YEARS	5-9 YEARS	10+ YEARS
Multiple Vitamins. Did you take...											
Regular Once-A-Day, Centrum, or Thera type	<input type="checkbox"/>										
Stress-tabs or B-Complex type	<input type="checkbox"/>										
Antioxidant combination type	<input type="checkbox"/>										
Single Vitamins (not part of multiple vitamins)											
Vitamin A (not beta-carotene)	<input type="checkbox"/>										
Beta-carotene	<input type="checkbox"/>										
Vitamin C	<input type="checkbox"/>										
Vitamin E	<input type="checkbox"/>										
Folic acid, folate	<input type="checkbox"/>										
Calcium, alone or combined with something else	<input type="checkbox"/>										
Zinc, alone or combined with something else	<input type="checkbox"/>										
Iron	<input type="checkbox"/>										
Selenium	<input type="checkbox"/>										

If you took Once-a-day, Centrum or Thera-type multiple vitamins, did you usually take types that

- contain minerals, iron, zinc, etc. do not contain minerals don't know

If you took vitamin C or vitamin E:

How many milligrams of vitamin C did you usually take, on the days you took it?

- 100 250 500 750 1000 1500 2000 3000+ Don't know

How many IUs of vitamin E did you usually take, on the days you took it?

- 100 200 300 400 600 800 1000 2000+ Don't know

Did you take any of these supplements at least once a month?

- Ginkgo Ginseng St. John's Wort Kava Kava Echinacea Melatonin DHEA
 Glucosamine/Chondroitin Something else Didn't take these

The next section is about your usual eating habits in the past year or so. This includes all meals or snacks, at home or in a restaurant or carry-out. There are two kinds of questions to answer for each food:

HOW OFTEN, on average, did you eat the food during the past year?

*Please DO NOT SKIP any foods. Mark "Never" if you didn't eat it.

HOW MUCH did you usually eat of the food?

*Sometimes we ask how many you eat, such as 1 egg, 2 eggs, etc., ON THE DAYS YOU EAT IT.

*Sometimes we ask "how much" as A, B, C or D. LOOK AT THE ENCLOSED PICTURES. For each food, pick the picture (bowls or plates) that looks the most like the serving size you usually eat.

(If you don't have pictures: A=1/4 cup, B=1/2 cup, C=1 cup, D=2 cups.)

*Sometimes we made the "D" column a darker color. This is just to remind you to make sure you really eat that large a serving.

EXAMPLE: This person drank apple juice twice a week, and had one glass each time. Once a week he ate a "C" sized serving of rice (about 1 cup).

HOW OFTEN	NEVER	A FEW	2-3	3-4	5-6	EVERY DAY	HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
		TIMES per YEAR	ONCE per MON.	ONCE per WEEK	TWICE per WEEK		TIMES per WEEK	TIMES per WEEK	A	B	C
Apple juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many glasses each time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much each time	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

HOW OFTEN

NEVER A FEW TIMES ONCE 2-3 TIMES ONCE 2 TIMES 3-4 TIMES 5-6 TIMES EVERY DAY
 per per per per per per per per
 YEAR MONTH MONTH WEEK WEEK WEEK WEEK

HOW MUCH EACH TIME

SEE PORTION SIZE PICTURES FOR A-B-C-D

How often do you eat each of the following fruits, just during the 2-3 months when they are in season?

Raw peaches, apricots, nectarines, while they are in season	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Cantaloupe, in season	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Strawberries, in season	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Watermelon, in season	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Any other fruit in season, like grapes, honeydew, pineapple, kiwi	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

How often do you eat the following foods all year round? Estimate your average for the whole year.

Bananas	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Apples or pears	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Oranges or tangerines	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Grapefruit	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Canned fruit like applesauce, fruit cocktail, or dried fruit like raisins	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

HOW OFTEN

NEVER FEW/YEAR ONCE/MONTH 2-3 TIMES/MONTH ONCE/WEEK TWICE/WEEK 3-4 TIMES/WEEK 5-6 TIMES/WEEK EVERY DAY

HOW MUCH EACH TIME

Eggs, including egg biscuits or Egg McMuffins (Not egg substitutes)	<input type="checkbox"/>	How many eggs each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Bacon	<input type="checkbox"/>	How many pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Breakfast sausage, including sausage biscuits	<input type="checkbox"/>	How many pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Pancakes, waffles, French toast, Pop Tarts	<input type="checkbox"/>	How many pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Breakfast bars, granola bars, Power bars	<input type="checkbox"/>	How many	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Cooked cereals like oatmeal, cream of wheat or grits	<input type="checkbox"/>	Which bowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
High-fiber cereals like All Bran, Raisin Bran, Fruit-n-Fiber	<input type="checkbox"/>	Which bowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

Which high-fiber cereal do you eat most often? **MARK ONLY ONE:** All Bran or Bran Buds Raisin Bran Fiber One, Fruit-n-Fiber, etc. Something else I don't know I don't eat it

Product 19, Just Right or Total cereal	<input type="checkbox"/>	Which bowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Any other cold cereal, like Corn Flakes, Cheerios, Special K	<input type="checkbox"/>	Which bowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Milk or milk substitutes on cereal	<input type="checkbox"/>	How many oz. on cereal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Yogurt or frozen yogurt	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Cheese, sliced cheese or cheese spread, including on sandwiches	<input type="checkbox"/>	How many slices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

When you eat cheese, is it Usually low-fat Sometimes low-fat Hardly ever low-fat Don't know/don't eat



HOW OFTEN

NEVER A FEW TIMES per YEAR ONCE per MONTH 2-3 TIMES per MONTH ONCE per WEEK 2 TIMES per WEEK 3-4 TIMES per WEEK 5-6 TIMES per WEEK EVERY DAY

HOW MUCH EACH TIME

SEE PORTION SIZE PICTURES FOR A-B-C-D

How often do you eat the following vegetables, including fresh, frozen, canned or in stir-fry, at home or in a restaurant?

	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	2 TIMES per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY	How much	A	B	C	D
Broccoli										How much				
Carrots, or mixed vegetables or stews containing carrots										How much				
Corn										How much				
Green beans or green peas										How much				
Spinach										How much				
Mustard greens, turnip greens, collards										How much				
French fries, fried potatoes or hash browns										How much				
White potatoes not fried, incl. boiled, baked, mashed & potato salad										How much				
Sweet potatoes, yams (Not in pie)										How much				
Cole slaw, cabbage										How much				
Green salad										How much				
Raw tomatoes, including in salad										How much	1/4	1/2	1	2
Salad dressing										How many Tbsp.	1	2	3	4
Is your salad dressing	<input type="checkbox"/> Usually low-fat <input type="checkbox"/> Sometimes low-fat <input type="checkbox"/> Hardly ever low-fat <input type="checkbox"/> Don't know/don't use													

HOW OFTEN

NEVER FEW/YEAR ONCE/MONTH 2-3 TIMES/MONTH ONCE/WEEK TWICE/WEEK 3-4 TIMES/WEEK 5-6 TIMES/WEEK EVERY DAY

HOW MUCH EACH TIME

	NEVER	FEW/YEAR	ONCE/MONTH	2-3 TIMES/MONTH	ONCE/WEEK	TWICE/WEEK	3-4 TIMES/WEEK	5-6 TIMES/WEEK	EVERY DAY	How much	A	B	C	D
Any other vegetable, like okra, squash, cooked green peppers										How much				
Refried beans or bean burritos										How much				
Chili with beans (with or without meat)										How much				
Baked beans, black-eye peas, pintos, any other dried beans										How much				
Vegetable stew										Which Bowl		B	C	D
Vegetable soup, vegetable beef, chicken vegetable, or tomato soup										Which Bowl		B	C	D
Split pea, bean or lentil soup										Which Bowl		B	C	D
Any other soup, like chicken noodle, chowder, mushroom, instant soups										Which Bowl		B	C	D
Spaghetti, lasagna or other pasta with tomato sauce										How much				
Cheese dishes without tomato sauce, like macaroni and cheese										How much				
Pizza, including carry-out										How many slices	1	2	3	4



HOW OFTEN

NEVER A FEW TIMES per YEAR ONCE per MONTH 2-3 TIMES per MONTH ONCE per WEEK 2 TIMES per WEEK 3-4 TIMES per WEEK 5-6 TIMES per WEEK EVERY DAY

HOW MUCH EACH TIME

SEE PORTION SIZE PICTURES FOR A-B-C-D

Do you ever eat chicken, meat or fish? Yes No **IF NO, SKIP TO NEXT PAGE**

Hamburgers, cheeseburgers, meat loaf, at home or in a restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much meat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											1/8 lb.	1/4 lb.	1/2 lb.	3/4 lb.
Tacos, burritos, enchiladas, tamales, etc. with meat or chicken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Beef steaks, roasts, pot roast, or in frozen dinners or sandwiches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
How do you like beef cooked?	<input type="checkbox"/> Rare	<input type="checkbox"/> Medium	<input type="checkbox"/> Well done	<input type="checkbox"/> I don't eat beef										
Pork chops, pork roasts, or dinner ham	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
When you eat meat, do you	<input type="checkbox"/> Avoid eating the fat	<input type="checkbox"/> Sometimes eat the fat	<input type="checkbox"/> Often eat the fat	<input type="checkbox"/> I don't eat meat										
Veal, lamb or deer meat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Ribs, spareribs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many ribs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											3-4	5-6	7-8	9+
Liver, including chicken livers or liverwurst	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Gizzard, pork neckbones, chitlins, pigs feet, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Mixed dishes with beef or pork, like stew, corned beef hash, stuffed cabbage, meat dish with noodles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Mixed dishes with chicken, like chicken casserole, chicken & noodles, pot pie or in stir-fry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Fried chicken, at home or in a restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	# medium pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											1	2	3	4
Chicken or turkey not fried, such as baked, grilled, or on sandwiches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
When you eat chicken, do you	<input type="checkbox"/> Avoid eating the skin	<input type="checkbox"/> Sometimes eat the skin	<input type="checkbox"/> Often eat the skin											

HOW OFTEN

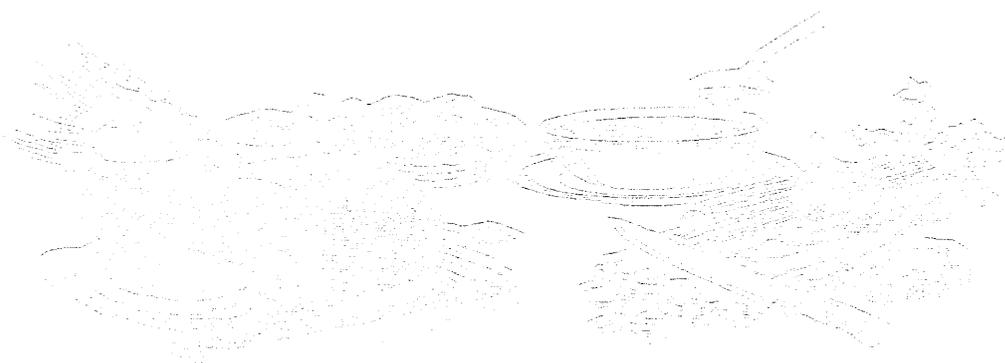
NEVER FEW/ YEAR ONCE/ MONTH 2-3 TIMES/ MONTH ONCE/ WEEK TWICE/ WEEK 3-4 TIMES/ WEEK 5-6 TIMES/ WEEK EVERY DAY

HOW MUCH EACH TIME

Oysters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Other shellfish like shrimp, scallops, crabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Tuna, tuna salad, tuna casserole	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much of the tuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Fried fish or fish sandwich, at home or in a restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Other fish, not fried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											A	B	C	D
Hot dogs, or sausage like Polish, Italian or chorizos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											1	2	3	4
Are your hot dogs	<input type="checkbox"/> Usually low-fat	<input type="checkbox"/> Sometimes low-fat	<input type="checkbox"/> Hardly ever low-fat	<input type="checkbox"/> Don't know/don't eat them										
Booney, sliced ham, turkey lunch meat, other lunch meat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many slices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
											1	2	3	4
Are your lunch meats	<input type="checkbox"/> Usually low-fat or turkey	<input type="checkbox"/> Sometimes low-fat	<input type="checkbox"/> Hardly ever low-fat											

HOW OFTEN	NEVER	A FEW	ONCE	2-3	2	3-4	5-6	EVERY DAY	HOW MUCH EACH TIME				
		TIMES per YEAR	per MONTH	TIMES per MONTH	ONCE per WEEK	TIMES per WEEK	TIMES per WEEK		TIMES per WEEK	SEE PORTION SIZE PICTURES FOR A-B-C-D			
Noodles, macaroni, pasta salad	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D							
Tofu, bean curd	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D							
Meat substitutes, such as veggie burgers, Gardenburgers	<input type="radio"/>	How many patties	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4							
Chinese food, Thai or other Asian food, not counted above	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D							
Snacks like potato chips, corn chips, popcorn (not pretzels)	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D							
Are these snacks <input type="checkbox"/> Usually low-fat <input type="checkbox"/> Sometimes low-fat <input type="checkbox"/> Hardly ever low-fat <input type="checkbox"/> Don't know/don't eat													

HOW OFTEN	NEVER	FEW	ONCE	2-3	ONCE	TWICE	3-4	5-6	EVERY DAY	HOW MUCH EACH TIME				
		per YEAR	per MONTH	TIMES per MONTH	per WEEK	per WEEK	TIMES per WEEK	TIMES per WEEK						
Peanuts, other nuts or seeds	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D								
Crackers	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D								
Doughnuts, Danish pastry	<input type="radio"/>	How many	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4								
Cake, sweet rolls, coffee cake	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D								
Are they <input type="checkbox"/> Usually low-fat <input type="checkbox"/> Sometimes low-fat <input type="checkbox"/> Hardly ever low-fat <input type="checkbox"/> Don't know/don't eat														
Cookies	<input type="radio"/>	How many	<input type="radio"/> 1-2	<input type="radio"/> 3-5	<input type="radio"/> 6-7	<input type="radio"/> 8+								
Are your cookies <input type="checkbox"/> Usually low-fat <input type="checkbox"/> Sometimes low-fat <input type="checkbox"/> Hardly ever low-fat <input type="checkbox"/> I don't know/don't eat														
Ice cream, ice milk, ice cream bars	<input type="radio"/>	How much	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D								
Is your ice cream <input type="checkbox"/> Usually low-fat <input type="checkbox"/> Sometimes low-fat <input type="checkbox"/> Hardly ever low-fat <input type="checkbox"/> I don't know/don't eat														
Pumpkin pie, sweet potato pie	<input type="radio"/>	How many slices	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3								
Any other pie or cobbler	<input type="radio"/>	How many slices	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3								
Chocolate candy, candy bars	<input type="radio"/>	How many bars	<input type="radio"/> small	<input type="radio"/> medium	<input type="radio"/> large	<input type="radio"/> large								
Other candy, not chocolate, like hard candy, caramel, jelly beans	<input type="radio"/>	How many pieces	<input type="radio"/> 1-2	<input type="radio"/> 3-5	<input type="radio"/> 6-7	<input type="radio"/> 8+								



HOW OFTEN	NEVER OR A FEW TIMES PER YEAR	2-3 TIMES ONCE per MONTH	2 TIMES ONCE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY	2+ TIMES per DAY	HOW MUCH EACH TIME				
								SEE PORTION SIZE PICTURES FOR A-B-C-D				
Biscuits or muffins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rolls, hamburger buns, English muffins, bagels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dark bread like rye or whole wheat, including in sandwiches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many slices each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
White bread or toast, including French, Italian, or in sandwiches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many slices each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corn bread, corn muffins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tortillas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many each time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rice, or dishes made with rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Margarine (not butter) on bread or on potatoes or vegetables, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many pats (tsp.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Butter (not margarine) on bread or on potatoes or vegetables, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many pats (tsp.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gravy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peanut butter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jelly, jam, or syrup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mayonnaise, sandwich spreads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Catsup, salsa or chile peppers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mustard, soy sauce, steak sauce, barbecue sauce, other sauces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	How many Tbsp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Did you use the pictures to choose your serving size on this form? Yes No I didn't have any pictures.

Would you say your health is Excellent Very good Good Fair Poor

How many times have you gone on a diet? Never 1-2 3-5 6-8 9 or more

Did you ever drink more beer, wine or liquor than you do now? Yes No

How many hours do you watch television or video, per day or per week on average?

None 1-6 hours/week 1 hour/day 2 hours/day 3 hours/day 4+ hours/day

Do you smoke cigarettes now? No Yes

IF YES, On the average about how many cigarettes a day do you smoke now?

1-5 6-14 15-24 25-34 35 or more

What language do you usually speak at home or with friends?

English Spanish Something else English & something else equally

What is your ethnic group? (MARK ONE OR MORE)

Hispanic or Latino Black or African American American Indian or Alaska Native
 White, not Hispanic Asian Native Hawaiian or Other Pacific Islander

237890

Appendix G: IRB Approval



Institutional Review Board

Dr. David M. Moore
IRB (Human Subjects) Chair
Assistant Vice President for Research Compliance
1880 Pratt Drive, Suite 2006, Blacksburg, VA 24061-0442
Office: 540/231-4991; FAX: 540/231-6033
email: moored@vt.edu

DATE: August 19, 2005

MEMORANDUM

TO: Kathy Hosig HNFE 0430
William G. Herbert Human Nutrition, Foods, & Exercise 0351
Eileen S. Anderson Psychology 0274
Sharon M. Nickols Human Nutrition, Foods, & Exercise 0430

FROM: David Moore 

SUBJECT: **IRB Full Review Approval:** "Pilot Study: Neighborhood Influences on Diet and Physical Activity" IRB # 05-425 FR

The above referenced protocol was submitted to the Virginia Tech IRB for full review and approval at its August 19, 2005 meeting. The IRB, at that meeting, voted approval for this protocol for a period of (12) months, effective as of August 19, 2005.

Approval of your research by the IRB provides the appropriate review as required by federal and state laws regarding human subject research. It is your responsibility to report to the IRB any adverse reactions that can be attributed to this study.

To continue the project past the 12-month approval period, a continuing review application must be submitted (30) days prior to the anniversary of the original approval date and a summary of the project to date must be provided. Our office will send you a reminder of this (60) days prior to the anniversary date.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File

Department Reviewer: Kevin P. Davy