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determinant of food choice (Drewnowski & Darmon, 2005). Individuals who report being more involved in food purchasing and preparation or who cook more often, are more likely to meet dietary guidelines (Larson, Story, Eisenberg, & Neumark-Sztainer, 2006). Confidence in the ability to prepare healthy meals also appears to be a significant factor (Winkel & Turrell, 2010). Furthermore, the social context in which meals are consumed (i.e., alone, with family or friends) can affect the types of foods consumed and the total caloric intake of a meal (Herman, Roth, & Polivy, 2003). However, consistent with an ecological approach (Sallis, Owen, & Fisher, 2008), broader neighborhood-level influences on diet may also be important, but to date have rarely been considered alongside personal and interpersonal variables. The neighborhood food environment provides opportunity to purchase food for both immediate and later consumption. This has led to a new and growing body of research investigating the relationship between availability of neighborhood food outlets and food choices.

The availability of neighborhood supermarkets is thought to be an indicator of access to healthy, nutritionally adequate and affordable food given that they generally provide better availability and selection, higher quality, and lower cost foods than smaller food stores (e.g., convenience stores; Sallis, Nader, Rupp, Atkins, & Wilson, 1986). Studies examining whether the proximity or density of neighborhood supermarkets are associated with the healthfulness of residents’ diets have largely focused on associations with fruit and vegetable consumption. Results have been mixed, with some studies reporting positive associations with increased supermarket proximity or density (Morland, Wing, & Diez Roux, 2002; Wrigley, Warm, & Margetts, 2003; Zenk et al., 2009), and others no association (Ball, Crawford, & Mishra, 2006; Pearson, Russell, Campbell, & Barker, 2005). Given that fruit and vegetable intake is only one component of a healthy diet, studies are required examining other foods that can be purchased from supermarkets.

The aim of this study is to use an ecological model to concurrently examine associations between individual, social, home, and neighborhood environmental factors and dietary intake among adults.

Method

Participants

This article is based on cross-sectional data from 565 participants participating in the fourth survey (February 2011 to March 2012) of the RESIDential Environment (RESIDE) project. RESIDE is a quasi-experimental longitudinal study evaluating the impact of the Western Australian government’s new subdivision design code on walking, cycling, public transport use, and sense of community. Details regarding the study design and sampling procedures appear elsewhere (Giles-Corti et al., 2008). Briefly, a cohort of people (n = 1,813) moving into 74 new housing developments in Perth, Western Australia were surveyed four times; prior to moving into their new home (baseline/T1), then at 12 (T2), 24 (T3), and 7-8 years (T4) after relocating. T4 was the only time point where participants self-reported dietary intake, home food availability, and behavioral and perceived social and physical environmental influences on food choices. The University of Western Australia Human Research Ethics Committee approved the study.

Measures

Dietary Intake. Participants self-reported frequency of intake of foods classified as “healthy” (11 items, Table 1) and “unhealthy” (11 items, Table 2). Reliability for these items was high with intraclass correlations (ICCs) ranging from 0.79 to 0.95. A scoring system broadly based on adherence to Guidelines 2 and 3 of the Australian Dietary Guidelines was used to compute “healthy” and “unhealthy” diet quality scores, respectively (National Health and Medical Research Council, 2013). Guideline 2 recommends that adults enjoy a wide variety of nutritious foods from the vegetable, fruit, grains, lean meats, and dairy food groups each day. Guideline 3 recommends that adults limit intake of foods containing saturated fat, added salt, added sugars, and alcohol. Both Guidelines provide recommendations for the optimal number of servings and serving sizes per day of foods. Items contributing to the “healthy” eating score were coded from 0 to 2 ("2" indicating optimal intake/met recommendations; "1" indicating moderate adherence and "0" indicating low adherence to recommendations; see Table 1), and then summed (range = 0-12). A higher “healthy” eating score reflects greater compliance with the dietary guidelines. Items comprising the “unhealthy” eating score were reverse-coded (see Table 2), and summed (range = 0-18), with a higher score indicating lower compliance with the dietary guidelines.

Individual Factors

Sociodemographic factors. Self-report sociodemographic factors included age, sex, marital status, education, work status, occupation, hours per week spent working, income, number of children < 18 years in the household, number of adults in the household, and access to a motor vehicle for personal use.

Intrapersonal factors. Participants reported how confident they felt in their ability to prepare a healthy meal (1 = not at all to 5 = very confident, ICC = 0.93), how much they like cooking (1 = dislike a lot to 5 = like a lot, ICC = 0.95; Winkel & Turrell, 2010) and the frequency they eat meals bought from a canteen or takeaway food shop (ICC = 0.82) or from a restaurant or cafe (ICC = 0.83; 1 = most days to 7 = never; Marks, Webb, Rutishauser, & Riley, 2001; New South Wales Health Department, 1994). Food insecurity was measured by, “In the last 12 months have you run out of food and couldn’t afford to buy more?” (yes/no; Australian Bureau of Statistics, 1997).

Social Factors. Two items (7-point scale: 1 = most days to 7 = never) measured the context of meals eaten: “How often do you eat meals together with other members of your
household?” (ICC = 0.71) and “How often do you eat meals alone or when doing something else (e.g., watching TV or working)?” (ICC = 0.84).

**Home Food Environment.** Participants were asked how frequently 19 food items were available in their home (Fulkerson et al., 2008; Neumark-Sztainer, Wall, Perry, & Story, 2003; 0 = Never; 1 = some of the time; 2 = about half the time; 3 = most of the time; 4 = always). All items had good test–retest reliability (ICC = 0.67-0.96). Seven items were summed to create a “healthy” home food inventory score (range = 0-28): fresh fruit; fresh, tinned, or frozen vegetables; wholemeal or wholegrain bread; porridge oats, muesli, cereals labeled “wholegrain” or “high fiber”; lean meat, chicken, or fish (fresh or tinned); reduced fat milk; reduced fat yoghurt or reduced fat cheese. Similarly, 12 food items were summed to create the “unhealthy” home food inventory score (range = 0-48): white bread or rolls; meat or chicken with visible fat; processed meats, salami, or sausages; full-cream milk; full-fat cheeses; potato chips, corn chips, cheese snacks; chocolate, or chocolate bars; sweets, lollies, or other confectionary; sweet biscuits, sweet pastries, or puddings; cakes or sweet muffins; pizzas, hamburgers, meat pies, sausage rolls, or pastries; and regular or sugar sweetened soft drink or flavored mineral water. Higher values on each home inventory score reflected greater availability of these items within the home.

### Table 1. “Healthy” Eating Score Based on Adherence to Guideline 2 of the ADG (National Health and Medical Research Council, 2013).

<table>
<thead>
<tr>
<th>Guideline 2 Questionnaire item</th>
<th>Item reliability (ICC)a</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables How many serves of vegetables do you usually eat each day? (Australian Bureau of Statistics, 2003)</td>
<td>≤ 1 serve</td>
<td>2-4 serves</td>
<td>≥5 serves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit How many serves of fruit do you usually eat each day (including fresh, dried, frozen and tinned fruit)? (Australian Bureau of Statistics, 2003)</td>
<td>Do not eat</td>
<td>1 serve or less</td>
<td>≥2 serves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairyb About how much milk (in total) do you usually have in a day? (Riley, Rutishauser, &amp; Webb, 2001)</td>
<td>0.79</td>
<td>&lt;150 mL/day</td>
<td>150-300 mL/day</td>
<td>301-600 mL/day</td>
<td></td>
</tr>
<tr>
<td>How often do you eat cheese (including ricotta, cottage processed, cream cheese hard, and soft cheeses)? (Riley et al., 2001)</td>
<td>0.89</td>
<td>≤1-2 times/week</td>
<td>3-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
<tr>
<td>Red meat and poultry How often do you eat red meat (beef, lamb, and kidney but not pork or ham)? Include all minimally processed forms of red meat such as chops, steaks, roast, rissoles, mince, stir-fries, and casseroles? (Riley et al., 2001)</td>
<td>0.95</td>
<td>6-7 times/week or if never/rarely/sometimes trims off fat</td>
<td>3-5 times/week and usually trims off fat</td>
<td>≤2-3 times/week and usually trims off fat</td>
<td></td>
</tr>
<tr>
<td>How often is the meat you eat trimmed of fat either before or after cooking? (Australian Bureau of Statistics, 1997)</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish How often do you eat fish?</td>
<td>0.86</td>
<td>≤ 1 time/month</td>
<td>2-3 times/month</td>
<td>≥1-2 times/week</td>
<td></td>
</tr>
<tr>
<td>Whole grains and pastaa How often do you eat bread (including bread rolls, flat breads, crumpets, bagels, English, or bread-type muffins)? (Riley et al., 2001)</td>
<td>0.87</td>
<td>&lt;3 times/week or eats white bread</td>
<td>3-5 times/week if multigrain or wholemeal or rye</td>
<td>6-7 times/week if multigrain or wholemeal or rye</td>
<td></td>
</tr>
<tr>
<td>What type of bread do you usually eat? (Baghurst &amp; Record, 1984)</td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you eat pasta, rice, noodles, or other cooked cereals? (Riley et al., 2001)</td>
<td>0.82</td>
<td>&lt;3 times/week</td>
<td>3-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** ADG = Australian Dietary Guidelines. ICC = intraclass correlation. ADG Guideline 2: Enjoy a wide variety of nutritious foods from these five food groups everyday: vegetables, fruit, grains, lean meats, and dairy (National Health and Medical Research Council, 2013).

a One-week test–retest reliability of these items was high (defined as ICC > 0.6; Landis & Koch, 1977). b Food group consisted of two items and was converted to a single score using the following criteria: 0 and 0 = 0; 1 and 1 = 1; 2 and 2 = 2; 0 and 1 = 0; 0 and 2 = 1; 2 and 1 = 2.
Neighborhood Environment. Participants were asked how much they agreed with two statements (Saelens, Sallis, Black, & Chen, 2003): “I can do most of my day-to-day shopping in my local area”; “There are many shops within easy walking distance of my home” (5-point scale: 1 = strongly disagree to 5 = strongly agree). Objective measures of supermarket availability included three separate variables: the presence of ≥1 supermarket within (a) 800 meters (referent = no), (b) 1,600 meters (referent = no), and (c) 3,200 meters (referent = no), from home by road, measured with a geographic information system. Supermarket (major and minor chains, independent supermarkets) locations were obtained from an electronic telephone directory database in 2007 and the West Australian Health Department in 2009. Distances ≤ 1,600 meters were chosen to represent the local neighborhood (i.e., the average distance a participant could walk at a moderate pace within a 30-minute round trip, Giles-Corti, Timperio, Bull, & Pikora, 2005). The additional distance of 3,200 meters was examined as supermarket trips taken by car may include supermarkets that are further away.

Table 2. “Unhealthy” Eating Score Based on Guideline 3 of the ADG (National Health and Medical Research Council, 2013).

<table>
<thead>
<tr>
<th>Guideline 3</th>
<th>Questionnaire item</th>
<th>Item reliability (ICC)</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated fat</td>
<td>How often do you eat chips, French fries, wedges, fried potatoes, or crisps? (Riley, Rutishauser, &amp; Webb, 2001)</td>
<td>0.90</td>
<td>≤2-3 times/month</td>
<td>1-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often do you eat biscuits, cakes, desserts, pastries, lollies and/or chocolate? (Rutishauser, Webb, Abraham, &amp; Allsop, 2001)</td>
<td>0.87</td>
<td>≤2-3 times/month</td>
<td>1-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often do you eat meat products such as sausages, frankfurter, polony, salami, meat pies, bacon, or ham? (Riley et al., 2001)</td>
<td>0.89</td>
<td>≤2-3 times/month</td>
<td>1-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often do you eat meat pies, sausage rolls, or other savoury pastries? (Riley et al., 2001)</td>
<td>0.88</td>
<td>≤2-3 times/month</td>
<td>1-5 times/week</td>
<td>6-7 times/week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often do you eat fried, roast, or barbecue chicken, pizza, burgers, or fish and chips? (Rutishauser et al., 2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often is the meat you eat trimmed of fat either before or after cooking? (Australian Bureau of Statistics, 1997)</td>
<td>0.93</td>
<td>Never or rarely</td>
<td>Sometimes</td>
<td>Usually</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>How often do you add salt to your food after it is cooked? (Australian Bureau of Statistics, 1997)</td>
<td>0.85</td>
<td>Must be both never or rarely</td>
<td>If any “sometimes”</td>
<td>If any “usually”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How often is salt added to our food during cooking? (Australian Bureau of Statistics, 1997)</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>How many cups of regular or sugar sweetened soft drinks, cordial or sports drinks do you drink in a day? (Nelson &amp; Lytle, 2009)</td>
<td>0.85</td>
<td>≤1 cup/day</td>
<td>1-2 cups/day</td>
<td>≥2 cups</td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>On how many days of the week do you usually drink alcohol? (Department of Health of Western Australia, 2011)</td>
<td></td>
<td>M:</td>
<td>≤4 standard drinks/day</td>
<td>F:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On a day when you drink alcohol, how many standard drinks do you usually have? (Department of Health of Western Australia, 2011)</td>
<td></td>
<td>F:</td>
<td>≤2 standard drinks/day</td>
<td>F:</td>
<td>2-4 standard drinks/day</td>
</tr>
</tbody>
</table>

Note. ADG = Australian Dietary Guidelines; M = male; F = female; ICC = intraclass correlation. One-week test–retest reliability of these items was high (defined as ICC > 0.6; Landis & Koch, 1977). ADG Guideline 3: Limit intake of foods containing saturated fat, added salt, added sugars, and alcohol (National Health and Medical Research Council, 2013).

Statistical Analysis

Descriptive statistics were computed for sociodemographic, intrapersonal, social, home, and neighborhood food environment variables. Of the 565 RESIDE participants surveyed, 558 provided complete dietary data for the “healthy” and 556 had complete data for the “unhealthy” eating score. Each independent variable was checked for effects of multicollinearity. Each intrapersonal, interpersonal, home environment, and neighborhood environment factor was separately entered into a linear regression model adjusting for sociodemographic factors (gender, age, education, income, children living at home, number of registered motor vehicles in the household) and clustering by estate only. Models were run...
twice; once for the “healthy” eating score and then again for the “unhealthy” eating score. Intrapersonal, interpersonal, home environment, and neighborhood environment factors found to be significant (p < 0.05) were included in a multiple regression model to examine their multivariate association with the (a) “healthy” and (b) “unhealthy” eating scores. All regression analyses controlled for sociodemographic variables that correlated with the dependent variables (defined as \( r \geq 0.1, p < 0.05 \)) and clustering by estate. SPSS Version 20.0 was used for the data analysis (2013).

### Results

The mean age of participants was 48 years (range = 25-80; Table 3). More than half (65%) had greater than secondary school education, with 30% having a bachelor’s degree or higher. Three in four participants (78%) were employed; 35% worked full time. The “healthy” eating score had a mean of 6.25 and standard deviation of 1.95 (range = 1-12) whereas the “unhealthy” eating score had a mean of 3.53 and standard deviation of 2.06 (range = 0-12).

Compared with participants lost to follow-up from baseline, participants in this sample were significantly less likely (\( p < 0.05 \)) to be male, younger in age, single, have no children living at home, work 60+ hours per week, and be a manager or blue collar worker. Dropout was not found to be significantly related to education level, household income, and work status (results not shown).

In univariate analyses, confidence in preparing healthy meals, enjoyment of cooking, frequency of meals bought from a takeaway food shop, home availability of healthy (positive) and unhealthy (negative) foods, and having a supermarket within 800 meters were associated with the “healthy” eating score (all \( p < 0.05 \)) and were included in the fully adjusted multivariate analyses (Table 4). After full adjustment, being confident in healthy meal preparation, having more “healthy” foods available in the home, and having a supermarket within 800 meters of home were significantly positively associated with the healthy eating score, whereas unhealthy food availability in the home was significantly negatively associated. Notably, having one or more neighborhood supermarkets present within 800 meters of home had the largest effect size.

Three intrapersonal factors, one social factor, and home availability of healthy and unhealthy foods were significantly (all \( p < 0.05 \)) associated with the “unhealthy” eating score in univariate analyses (Table 4). In the final fully adjusted model, being male (\( \beta = 0.39; 95\% CI = [0.02, 0.75] \)); frequency of meals bought from a takeaway, café, or restaurant; and having more unhealthy foods available within the home were significantly positively associated with the “unhealthy” eating score (Table 4). Conversely, having healthy foods available within the home was significantly negatively associated with the “unhealthy” eating score.

### Discussion

This study used an ecological model to concurrently examine associations between individual, social, home, and both perceived and objectively assessed neighborhood environment factors and dietary intake among Australian adults. “Healthy” dietary intake was associated with having confidence to prepare healthy meals, having more healthy foods and fewer unhealthy foods available within the home, and having a supermarket within 800 meters of home. “Unhealthy” dietary intake was associated with being male; frequently eating meals bought from a takeaway food shop, café, or restaurant; and having fewer healthy foods and more unhealthy foods available within the home.

Consistent with previous research, having the confidence to prepare healthy meals was associated with healthy eating (Michaud, Condrasky, & Griffin, 2007; Winkler & Turrell, 2010). Cooking skills and the confidence to use them are important for a number of reasons. Foods prepared at home can be more nutritious than foods purchased pre-prepared (Porter & Patterson, 1994), and healthier dietary variety can be achieved by people who regularly cook from fresh or raw ingredients (Caraher et al., 1999). Furthermore, cooking skills may form a part of a positive general health outlook, empowering people to prepare their own nutritious foods and assisting them to make sound purchasing decisions (Caraher et al., 1999). Cooking skills are thought to be declining or devalued due to the rise in convenience foods and the demise of school home economics curricula (Begley & Gallegos, 2010; Short, 2003). Yet paradoxically, cooking-related television shows, celebrity chef personas, food magazines, and cookbooks are enjoying unprecedented popularity among diverse audiences (de Solier, 2005). However, television chefs’ meals typically do not comply with World Health Organization nutritional guidelines (Howard, Adams, & White, 2012). Given the popularity of television chef programs, there is an opportunity to promote healthy eating through this medium. However, improving people’s confidence and ability to prepare nutritionally sound meals may require television programs to actively promote healthy food options that are simple to prepare and complemented by school and community programs focused on translating nutrition concepts and healthy cooking techniques (Condrasky & Hegler, 2010).

Frequent eating of meals bought from a takeaway, café, or restaurant was associated with unhealthy dietary intake. This is not surprising given the observed positive associations between frequency of restaurant food/fast-food consumption and total energy intake, percentage energy from fat, body mass index (BMI), and body fatness (French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001; McCrory et al., 1999). Although there has been some effort by large fast-food chains to improve the nutritional profile of their menus, fast-food meals are generally high in total fat, saturated fat, and total energy and low in vitamins, minerals, and...
dietary fiber (Antoniolli, Atkinson, & Palmer, 2013; Kirkpatrick et al., 2014). Therefore, dietary interventions targeting eating at fast-food restaurants may be of considerable benefit to improving dietary quality.

Consistent with previous research (Campbell et al., 2007; Kratt, Reynolds, & Shewchuk, 2000; Raynor, Polley, Wing, & Jeffery, 2004), availability of foods within the home was significantly associated with dietary intake. This suggests that encouraging people to limit the availability of unhealthy foods within the home (e.g., soft drinks, sweet biscuits, and pastries), and increasing the availability of healthy foods (e.g., fruit and vegetables, fish, low-fat dairy) would reduce cues to eat unhealthy foods and increase cues to eat healthy food options. The choice of foods available is affected by weekly shopping choices and supporting better and thoughtful choices at the point of decision in supermarkets should be encouraged. Accessibility of healthy foods within the home helps create a supportive home food environment. For example, placement of healthy foods in locations that facilitate consumption, such as fruit on the bench, have been shown to support healthful dietary intake in youth (Cullen et al., 2003; van der Horst et al., 2007). Furthermore, Neumark-Sztainer et al. (2003) found that even when taste preferences for fruits and vegetables were low, if fruits and vegetables were available in the home, intakes were higher. Around 68% to 87% of total energy consumed is from foods prepared within the home (Burns, Jackson, Gibbons, & Stoney, 2002; McLennan & Podger, 1997), yet there have been relatively few home-based interventions to improve dietary intake other than interventions around what to buy in the supermarket (Flynn et al., 2006). Future research should focus on understanding influences on food-purchasing behavior along with environmental interventions targeting the home environment.

This study found that residing within walking distance (i.e., 800 meters or less) of a supermarket was positively associated with healthy (but not unhealthy) dietary intake. These findings support previous studies reporting a positive association between supermarket access and adult fruit and vegetable consumption (Morland et al., 2002; Wrigley et al., 2003; Zenk et al., 2009); however, other studies have reported no association (Ball et al., 2006; Pearson et al., 2005). Discrepancies in findings may relate to the differences in defining availability (i.e., proximity to the nearest store vs. store density), the fact that fruits and vegetables can be brought from other places (e.g., green grocers, markets) and that other determinants of food choices were not assessed. Nevertheless, in this study, the largest effect on healthy dietary intake was proximity to supermarkets. This highlights the importance of the urban planning decisions that determine the geographical location of food outlets. Planning for local shopping centers may facilitate better food choices than planning for large “big box” regional shopping centers with large catchment areas. This is particularly important for groups with less mobility (e.g., older and younger adults; and those with lower incomes) and less access to private motor vehicles for food shopping and, often, poorer access to public transport. Ensuring equitable access to a range of affordable healthy foods is especially critical for lower socioeconomic groups (Morland et al., 2002; Turrell, 1996). For example, evidence from the United States and Australia suggests that the distribution of food stores may be inequitable, with less advantaged areas having greater access to fast-food outlets and more advantaged areas greater access to supermarkets (Burns & Inglis, 2007; Larson & Story, 2009). Designing communities to facilitate equitable local food access is an issue that developers, planners, and urban designers can positively influence (Donovan, Larsen, & McWhinnie, 2011). Policy interventions aimed at improving the healthfulness of neighborhood food environments as well as access to healthy food outlets may be promising targets for large-scale public health interventions addressing healthy eating.

A strength of this study was its use of an ecological model to examine sociodemographic, intrapersonal, social, and home and neighborhood food environment influences on composite measures of dietary intake concurrently. To date,
Table 4. Intrapersonal, Social, and Environmental Variable Descriptive Information and Their Association With the ‘Healthy’ and “Unhealthy” Eating Score.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Univariatea</th>
<th>Multivariateb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence in preparing healthy mealsc</td>
<td>3.95 (0.84)</td>
<td>0.57 [0.37, 0.77]***</td>
</tr>
<tr>
<td>Likes cookingd</td>
<td>3.64 (0.97)</td>
<td>0.24 [0.07, 0.42]**</td>
</tr>
<tr>
<td>Frequency of eating meals bought from a takeaway food shop</td>
<td>4.57 (1.47)</td>
<td>–0.14 [–2.69, 0.06]*</td>
</tr>
<tr>
<td>Frequency of eating meals bought from a cafe or restaurant</td>
<td>4.72 (1.24)</td>
<td>0.06 [–0.09, 0.20]</td>
</tr>
<tr>
<td>Food insecurity (%)</td>
<td>3.20</td>
<td>–0.56 [–1.61, 0.49]</td>
</tr>
<tr>
<td>Social factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of eating meals alone or when doing something else (e.g., watching TV or working)c</td>
<td>1.46 (1.07)</td>
<td>0.14 [–0.10, 0.69]</td>
</tr>
<tr>
<td>Frequency of eating meals together with other members of the householdd</td>
<td>4.10 (2.09)</td>
<td>0.15 [–0.03, 0.31]</td>
</tr>
<tr>
<td>Home food environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy home food inventoryf</td>
<td>22.61 (4.50)</td>
<td>0.14 [0.10, 0.18]***</td>
</tr>
<tr>
<td>Unhealthy home food inventoryg</td>
<td>20.70 (8.32)</td>
<td>–0.04 [–0.07, 0.02]***</td>
</tr>
<tr>
<td>Neighborhood food environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can do most of my day to day shopping in my local areah</td>
<td>3.60 (0.14)</td>
<td>0.02 [–0.14, 0.11]</td>
</tr>
<tr>
<td>There are many shops within easy walking distance of my homeh</td>
<td>2.87 (1.34)</td>
<td>0.11 [–0.03, 0.24]</td>
</tr>
<tr>
<td>≥1 supermarket within 800 meters (%) (referent = no)</td>
<td>2.5</td>
<td>1.59 [0.49, 2.69]***</td>
</tr>
<tr>
<td>≥1 Supermarkets within 1,600 meters (%) (referent = no)</td>
<td>19.3</td>
<td>0.24 [–0.22, 0.69]</td>
</tr>
<tr>
<td>≥1 Supermarkets within 3,200 meters (%) (referent = no)</td>
<td>51.2</td>
<td>0.16 [–0.22, 0.55]</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval; SD = standard deviation.

aEach intrapersonal, interpersonal, home environment, and neighborhood environment factor was separately entered into a linear regression model adjusting for sociodemographic factors (gender, age, education, income, children living at home, number of registered motor vehicles in the household) and clustering by estate only. bAnalyses adjusted for all other variables in the model, sociodemographics (gender, age, education, income, children living at home, number of registered motor vehicles in the household) and clustering by estate. c1 = not confident, 5 = very confident. d1 = I dislike it a lot, 5 = I like it a lot. e1 = never, 7 = 6-7 times/week. fRange = 4 to 28, the higher the healthier. gRange = 1 to 48, the higher the unhealthier. h1 = strongly disagree, 5 = strongly agree.

*p ≤ .05. **p ≤ .01. ***p ≤ .001.
few studies have examined food intake from an ecological perspective, incorporated both perceived and objective environmental measures, and assessed dietary intake beyond just a measure of fruit and vegetable intake. Future studies replicating our findings are warranted. This study also objectively assessed access to supermarkets, where the majority of the foods in our composite measure are usually purchased. However, the role of availability and proximity to a range of other food stores should be considered in future studies, particularly given the abundance of different types of stores where food can be purchased and that participants may not have shopped at their closest supermarket. Other important accessibility factors (e.g., opening hours, parking and public transport availability) and in-store environments (e.g., availability, quality, or cost of foods) should also be considered. Furthermore, in this study supermarket locations were collected in 2007-2009 and it is possible that these may have changed by the time this survey was completed in 2011-2012. The self-report dietary intake data may have been subject to random and systematic bias, underreporting, and social desirability bias (Armstrong, White, & Saracci, 1992). The lack of portion size data on dietary intake is also a limitation of this study. Future research should also include a wider variety of intrapersonal, interpersonal, and environmental variables. Results should be interpreted with caution as some measures and items were newly developed and without evidence of validity. Nevertheless, these items were based on existing validated questionnaire items developed for use in Australian populations and a 1-week test–retest of all items found their reliability to be high. The cross-sectional design is also a limitation of this study. The fourth RESIDE survey (T4) is the only time point when participants self-reported dietary intake, home food availability, and behavioral and perceived social and physical environmental influence on food choices. Thus, longitudinal analyses were not possible. Finally, these findings may not be generalizable given that participants were building new homes at the time of recruitment and thus, the socioeconomic status of the sample may be higher than average. Replication of our results in other cohorts would help address this.

**Implications for Policy and Practice**

Initiatives to improve adherence to dietary guidelines and reduce the consumption of unhealthy foods need to be multifaceted and address individual factors and access to healthy food choices in both the home and neighborhood food environment. There is a need for interventions targeting cooking and food-purchasing skills, healthier away-from-home food choices as well as access to supermarkets. These findings highlight the importance of the local food environment and the role that planning plays in increasing access to local supermarkets. The findings also underscore the importance of including characteristics of individuals’ neighborhood food environments into future studies to gain a better understanding of barriers and facilitators to healthy eating and the role of planning in facilitating access to local food choices. Ensuring proximity to local supermarkets, particularly in new suburban developments, appears to be an important strategy for facilitating healthy eating.

**Authors’ Note**

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**Declaration of Conflicting Interests**

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