

The importance of co-location and culture in determining destinations for transport planning: a case study of access to a suburban healthy food basket



Shaun Scholes,¹ Laura Vaughan,² Ashley Dhanani,² Sadie Boniface,¹ Jennifer Mindell¹

¹ Research Department of Epidemiology and Public Health, University College London

² The Bartlett, Faculty of the Built Environment, University College London



P14-5747

Background

Much previous research on the availability, accessibility and price of healthy foods in local environments has relied exclusively on population-weighted centroids and geographic locations of food outlets.¹⁻³ Further, only around half of previous studies that measured proximity to food outlets used street network distance.⁴

While this approach determines whether or not families/neighbourhoods have physical access to healthy foods, it ignores preferences: where residents actually choose to purchase food and their motivations for shopping there.

Exploring important influences on destinations for food shopping requires integrating and analysing individual and spatial data in novel ways.⁵



We conducted a pilot study to examine the following questions:

Can meaningful data on food shopping destinations be collected from the main food buyer in households via teenage schoolchildren?

Can space syntax analysis using survey data in tandem with spatial data provide new insights into the role of cultural preferences as influences on food shopping destinations?

Borehamwood, a suburb north of London, was chosen because of prior research on the area.⁶ This area contains a large Jewish community (~15% population in 2011) which allowed us to examine cultural influences on food shopping.

Methods/Data

Survey of main food buyers

In partnership with a Jewish secondary school, we distributed a short paper questionnaire to Year 9 pupils (aged 13-14) for the household's main food buyer to complete. The survey could also be completed online. Survey topics included: food purchasing in the last fortnight (which items of a short list of items were bought and where); mode of travel; influences on food choice; and demographics.

The response rate was 24% ($n=26$, of whom 18 completed the survey online).

Land use and spatial data

- Home address and locations for food shopping were geocoded using the postcode.
- Land use data from UK national mapping agency identified local shops. A census of shops in Borehamwood was conducted to determine availability and price of the most frequently purchased items from the survey basket.
- Transport networks were derived from UK road centreline maps and transformed using geographic information systems (GIS) to prepare data for space syntax network analysis.

Combined analysis

- Street network distance was computed from home address to (i) *nearest* and (ii) *actual* food outlets visited and street network accessibility was analysed using space syntax;
- Influence of cultural preferences was examined by comparing travel distance to 'kosher'^a vs. 'non-kosher' shops after accounting for number of items purchased.

^aKosher: Complying with Jewish dietary laws.

^bIf a participant bought 2 items from Kosher location A (1016 metres) and 13 items from location B (10,562 metres) then the mean distance per item was $(1016/2) + (10,562/13) = 1320$ metres

Results

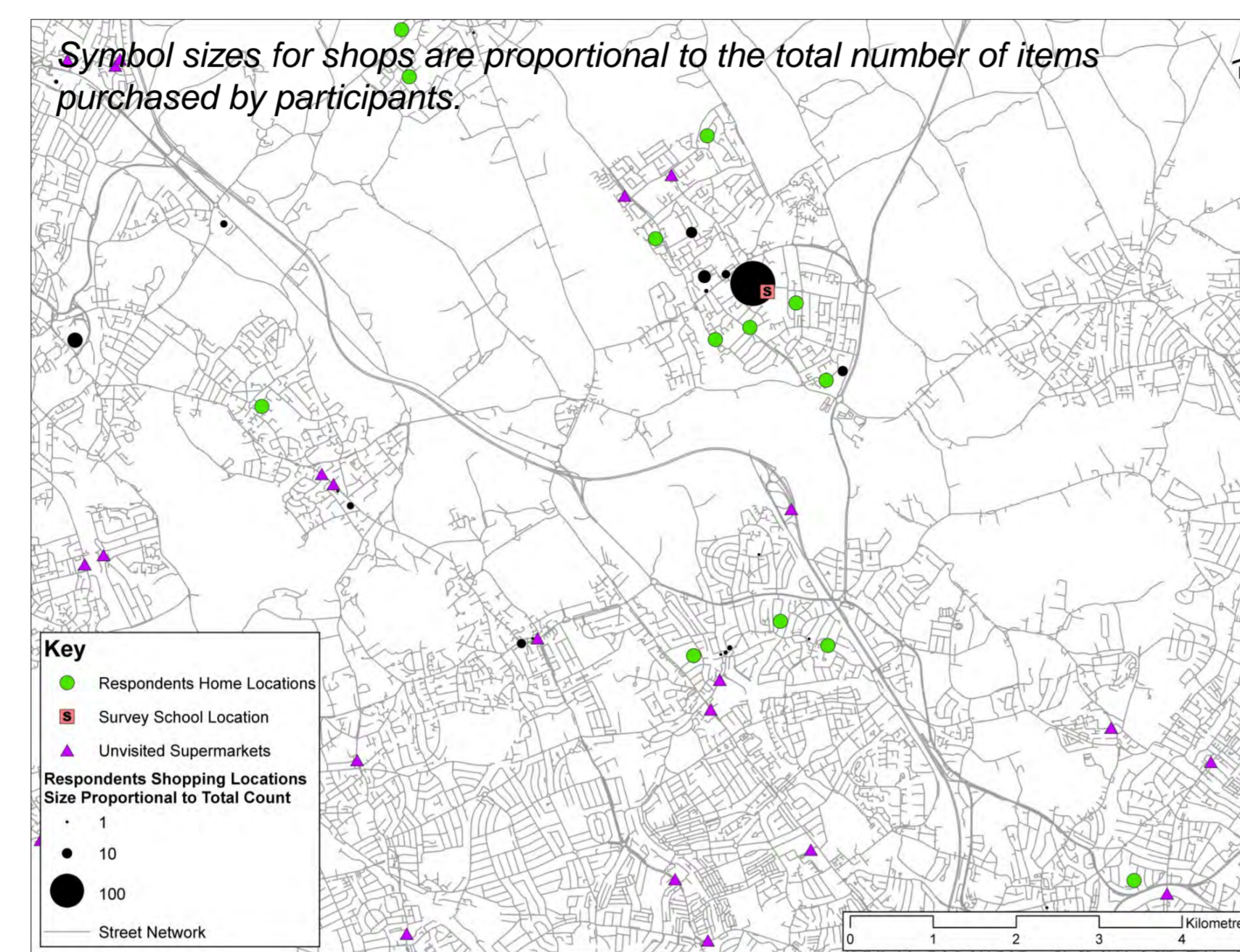


Figure 1. Principal and potential destinations for food shopping.

88% of 26 participants normally carried out their main food shopping at a large supermarket. 8% carried out their main shopping online. The majority (92%) usually travelled to the main shopping destination by car, taking <15 minutes to travel there. Most items were purchased from a large supermarket close to the school (Figure 1).

Quality or freshness was the most important reported influence on food choice (Figure 2).

The street network distance travelled from home to 'kosher' shops greatly exceeded that of 'non-kosher' shops (Figure 3). Mean distances per item purchased^b were:

- 6,974 metres to kosher shops
- 811 metres to non-kosher shops

Many of the chosen shops were situated on accessible routes (Figure 4), although the (limited) results suggest that either routine bulk shopping (in the case of the supermarket) or cultural preferences (in the case of the smaller kosher shops) are the overriding factors in food shopping preferences. Further qualitative study is needed to explore decision-making further.

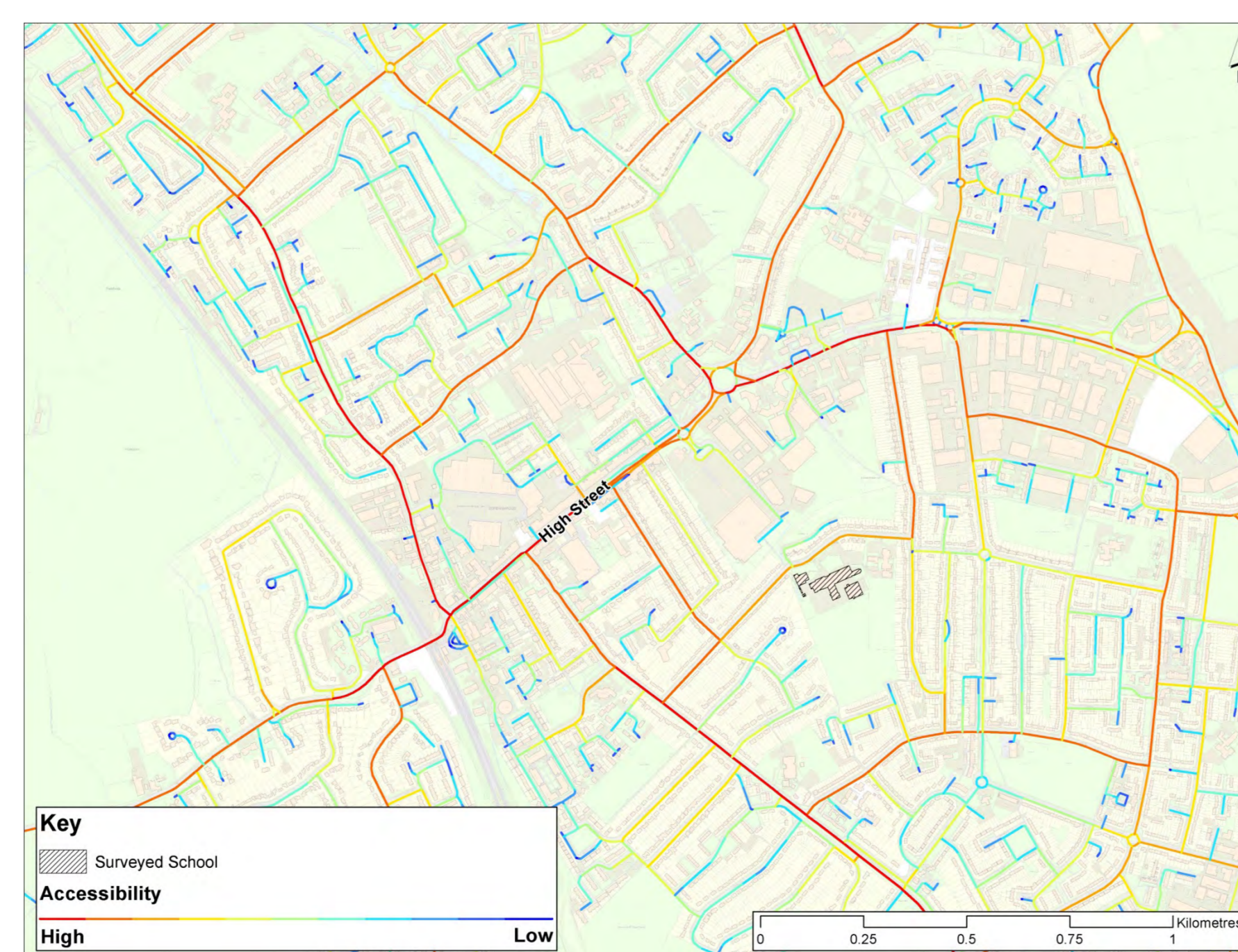


Figure 4. Structural accessibility of the street network in the vicinity of the school

Accessibility is quantified using the space syntax betweenness analysis that quantifies the degree to which a particular section of the street network is between all other network elements at a specified radius (in this case, 3000m). The high street (labelled) forms part of the principal network that facilitates through movement in the area around the school.

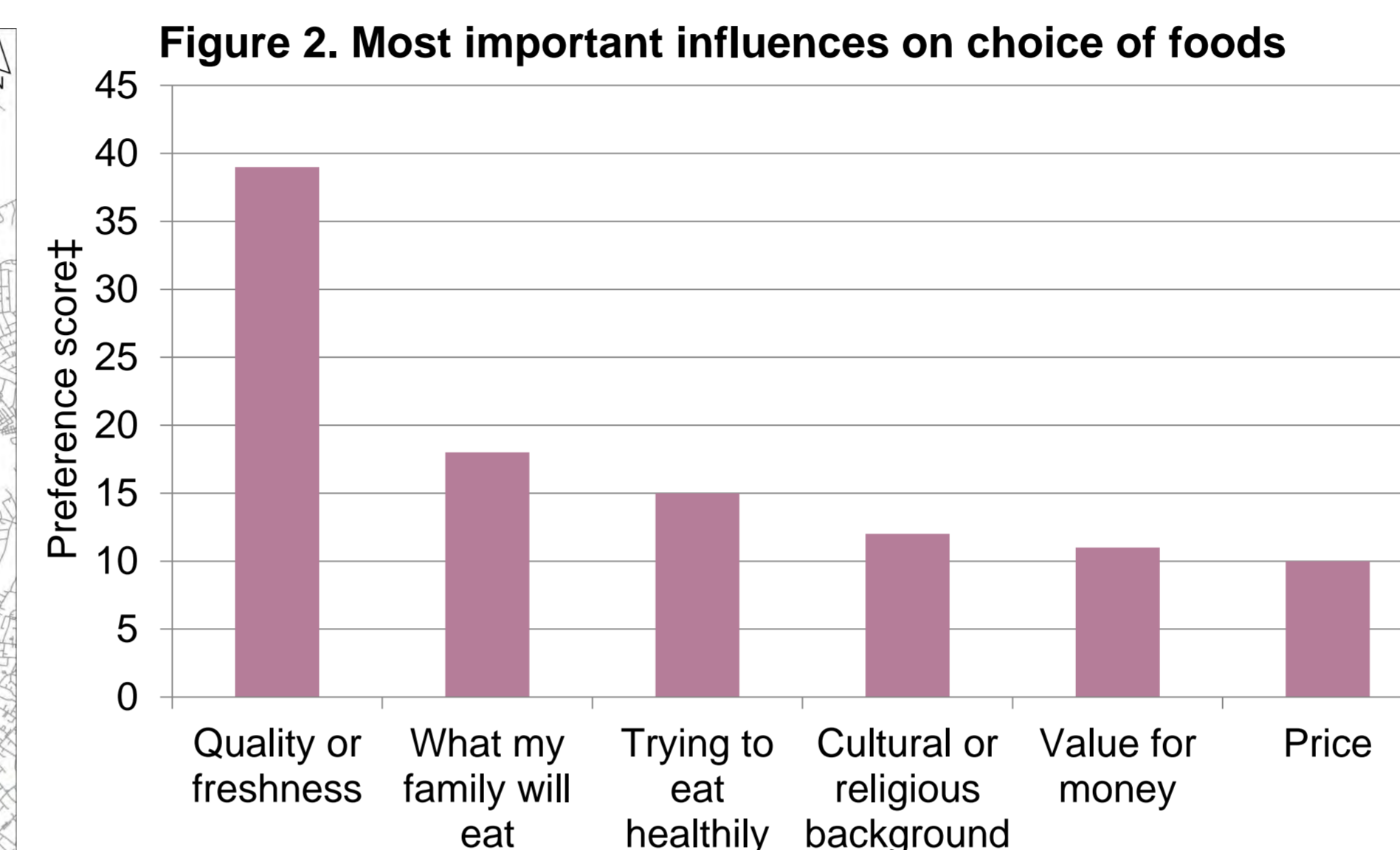


Figure 2. Most important influences on choice of foods

[†] Participants ($n=22$) asked to identify the three most important influences. Most important given a score of 3; 3rd most important a score of 1. Maximum possible score for an influence was therefore $22 \times 3 = 66$.

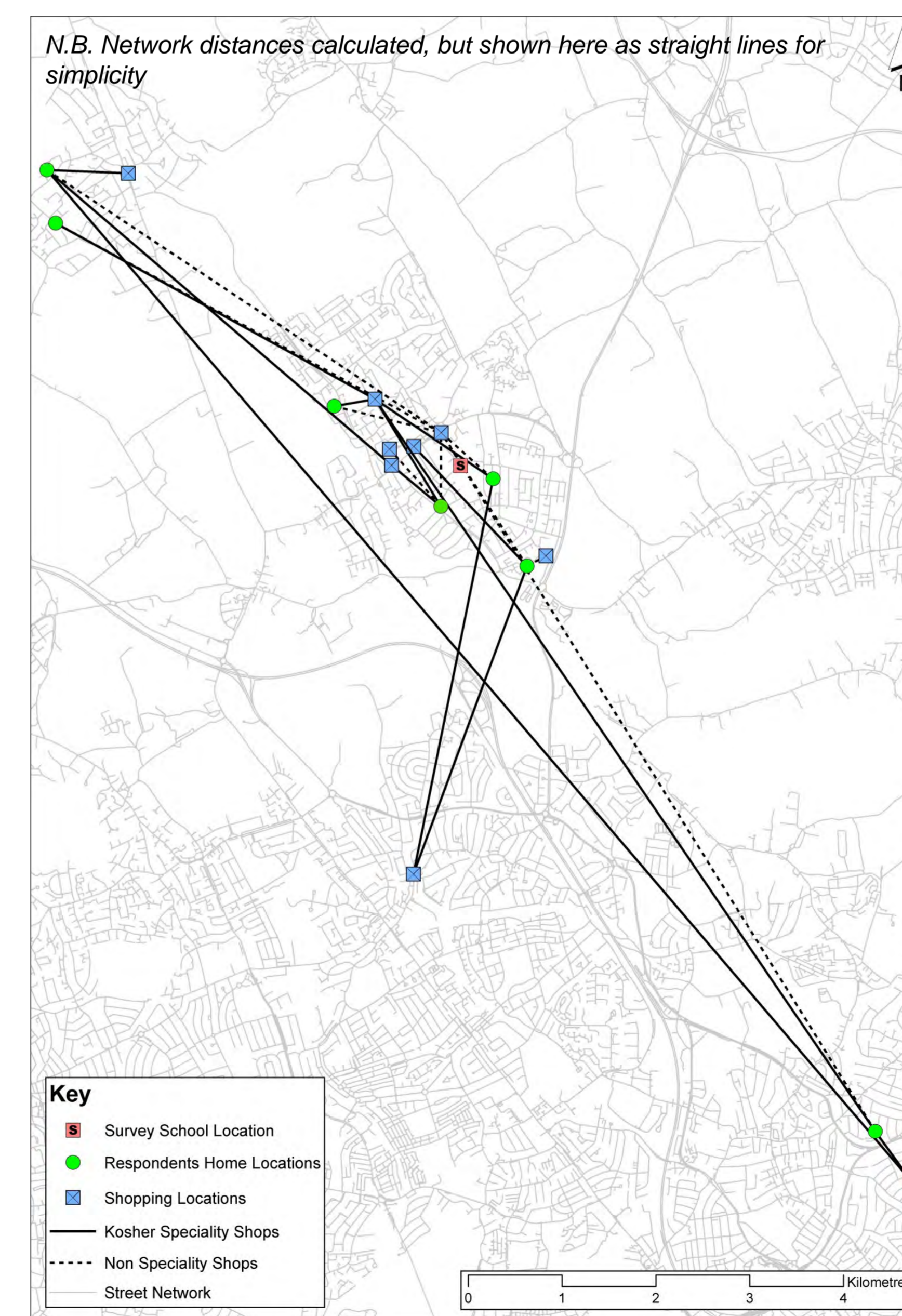


Figure 3. Street network distance for 'kosher' and 'non-kosher' food shops

(—) Network distance to 'kosher' shops
(---) Network distance to 'non-kosher' shops

Discussion

Combined survey and spatial analyses are feasible and can broaden understanding. Our exploratory study suggests that residents are willing to travel outside their immediate locality to purchase culturally appropriate food in specialist shops.

Strengths

Our pilot study used innovative methods to go beyond exclusive use of spatial data to examine destinations for and influences on food shopping – providing insight into preferences associated with culture.

An interdisciplinary project involving researchers from the Faculty of the Built Environment and the Faculty of Population Health Sciences.

Data from different sources (survey and GIS) were brought together in a novel way.

National surveys cannot provide details about 'locality': we utilised local knowledge and school contacts to gather data on food shopping destinations in a timely and cost-effective manner.

Limitations

The sample size was small in our pilot study. At this stage, our research is descriptive and exploratory. Our findings are not generalisable to the wider English population; those surveyed were parents of children aged 13-14 at a single faith school.

The response rate was moderate, but within the expected range for a school-based survey.

Difficulties in recruiting a second school prevent conclusions being drawn about the co-location of the study school with the large supermarket.

Conclusion

We have shown how an innovative use of survey and spatial data can reveal the influences of daily routines and cultural preferences on destinations for food shopping.

Existing literature on access to healthy food and 'food deserts' focuses largely on distance to nearest supermarket/food outlet. In practice, residents are willing to travel beyond their immediate locality to purchase culturally relevant foods from specialist shops.



Contact

Dr Jennifer Mindell: j.mindell@ucl.ac.uk @j_mindell

References

- Winkler, E., Turrell, G., & Patterson, C. (2006). Does living in a disadvantaged area mean fewer opportunities to purchase fresh fruit and vegetables in the area? Findings from the Brisbane food study. *Health & Place*, 12(3), 306–319.
- Apparicio, P., Cloutier, M.-S., & Shearmur, R. (2007). The case of Montréal's missing food deserts: Evaluation of accessibility to food supermarkets. *International Journal of Health Geographics*, 6(1), 4.
- Smith, D. M., Cummins, S., Taylor, M., Dawson, J., Marshall, D., Sparks, L., & Anderson, A. S. (2010). Neighbourhood food environment and area deprivation: spatial accessibility to grocery stores selling fresh fruit and vegetables in urban and rural settings. *International Journal of Epidemiology*, 39(1), 277–284.
- Charreire H, Casey R, Salze P, Simon C, Chaix B, Banos A, et al. Measuring the food environment using geographical information systems: a methodological review. *Public Health Nutr*. 2010;13(11):1773–85.
- Drewnowski, A., Aggarwal, A., Hurvitz, P. M., Monsivais, P., & Moudon, A. V. (2012). Obesity and Supermarket Access: Proximity or Price? *American Journal of Public Health*, 102(8), e74–e80.
- Vaughan L. (2006). Making connections: the case of Borehamwood. *Built Environment*, 32(3): 281-97.

The survey was approved by the School's Senior Leadership Team, and given UCL Research Ethics approval (Project ID: 4751/001).