# Examining the association between food outlets and eating behaviour: A Geographic Information System (GIS) study

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Introduction

- Excess energy-intake is a major contributor of weight-gain
- The presence and availability of food increases craving and cues food intake (Schüz, Bower & Ferguson, 2015; Sobik, Hutchinson & Craighead, 2005)
- Previous research has relied on self-reported measures of environmental contexts, but this is prone to bias
- Using GPS/GIS data may eliminate the need to rely on self-reports for determining local environmental contexts
- mHealth apps could potentially deliver dietary interventions based on individuals location and predicted risk of eating
- This study explores the feasibility of using passively collected GIS data to predict snacking
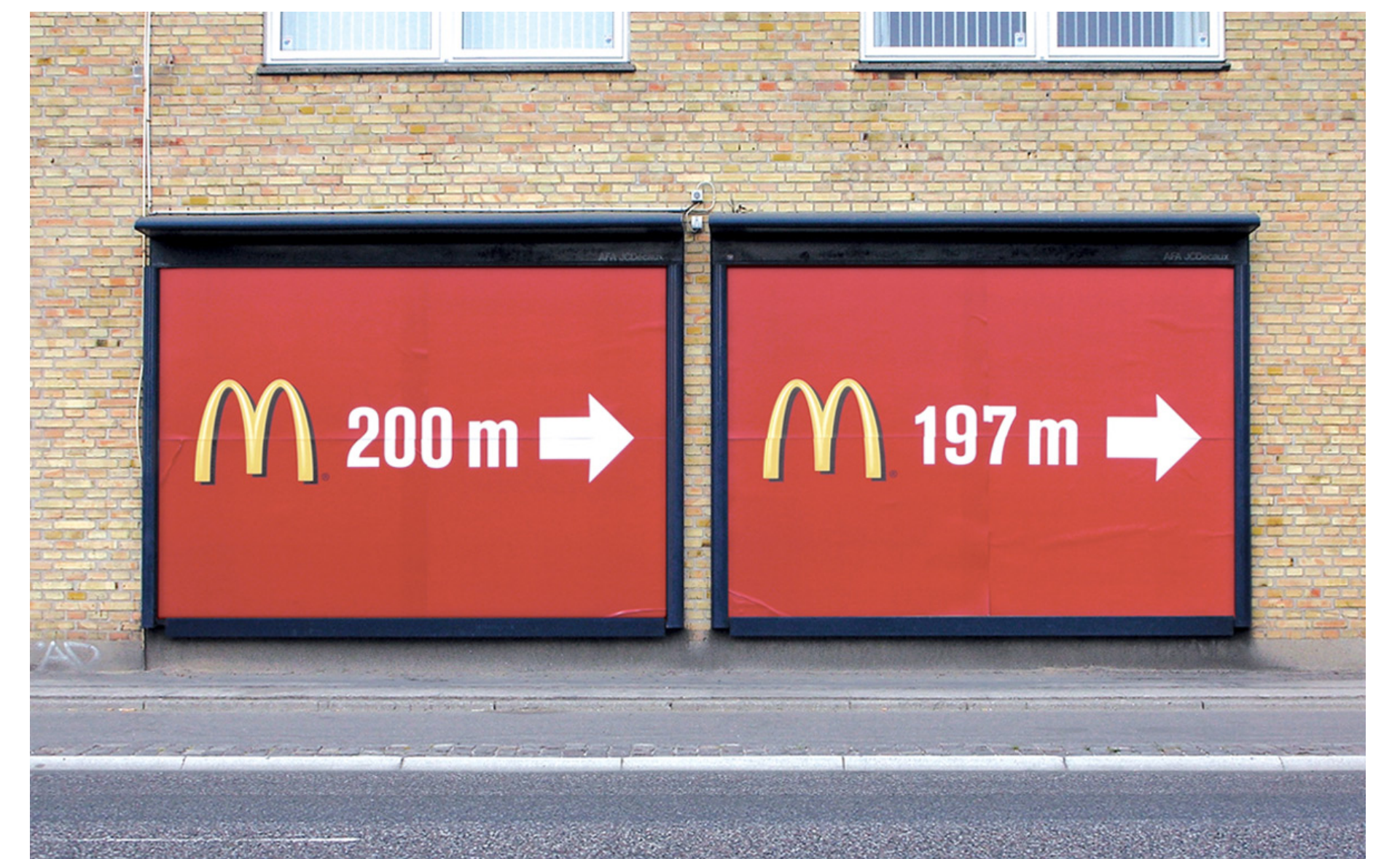
Method

- 74 adults reported their food intake and location for two weeks using EMA monitoring (Elliston, Ferguson & Schüz, 2017)
- The type and number of nearby food outlets and GPS location was recorded
- GPS location was plotted on a GIS map of food outlets, allowing for calculation of the number (and type) of food outlets within a 50m radius of an individual
- GIS and self-reported measures of food outlets were compared to determine if GIS data adequately captures environmental contexts
- Food outlet density was assessed to determine environmental cues to eating
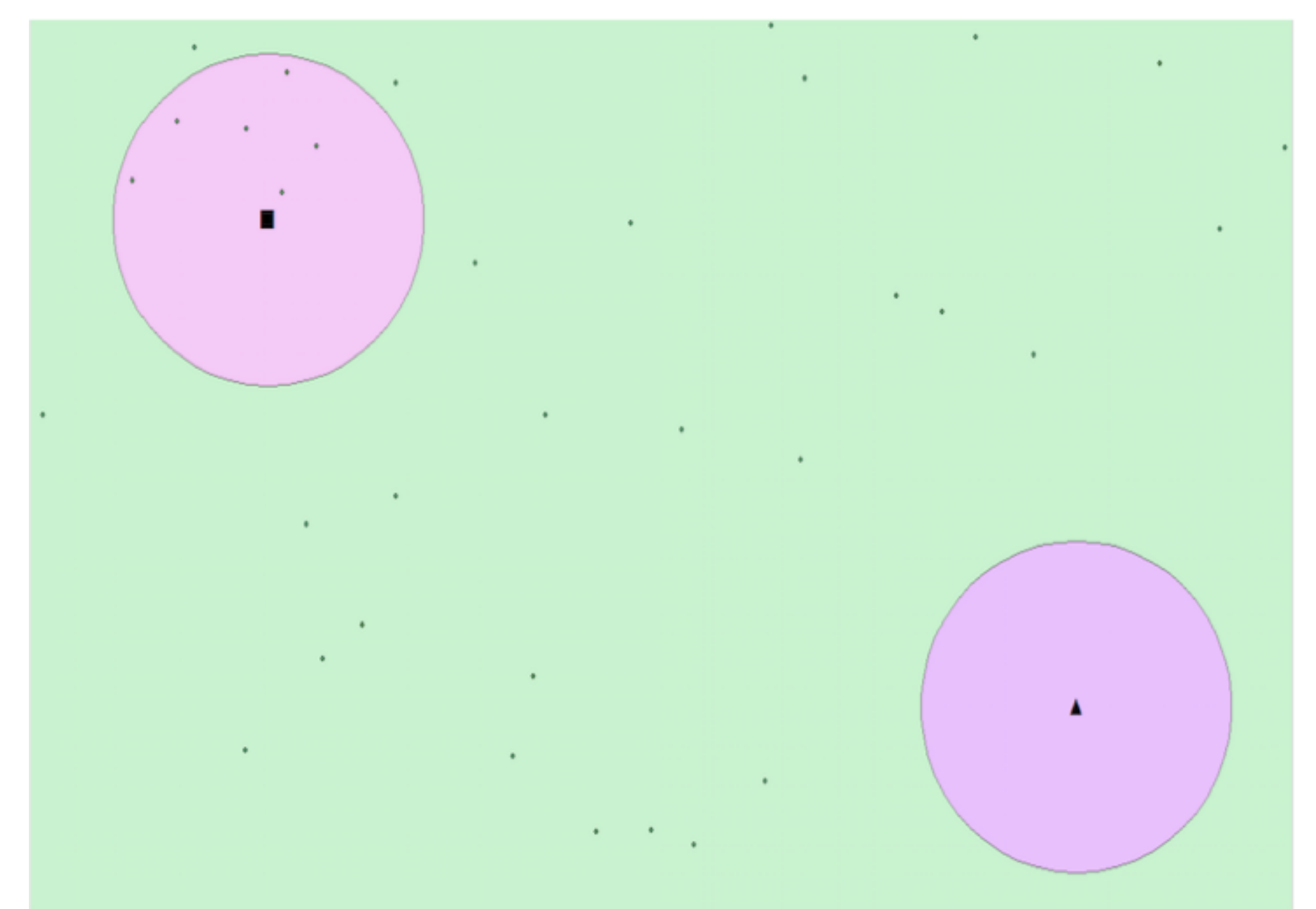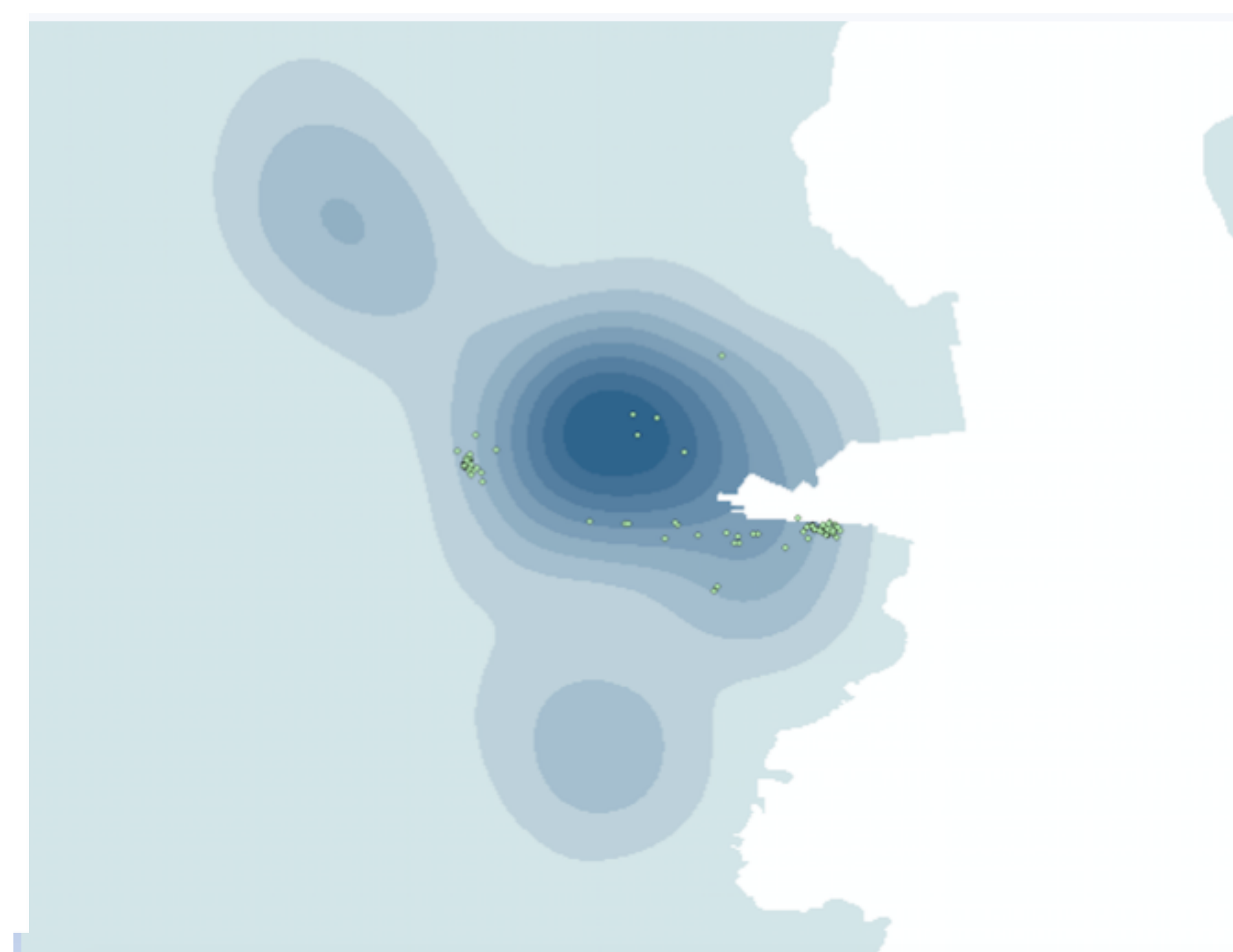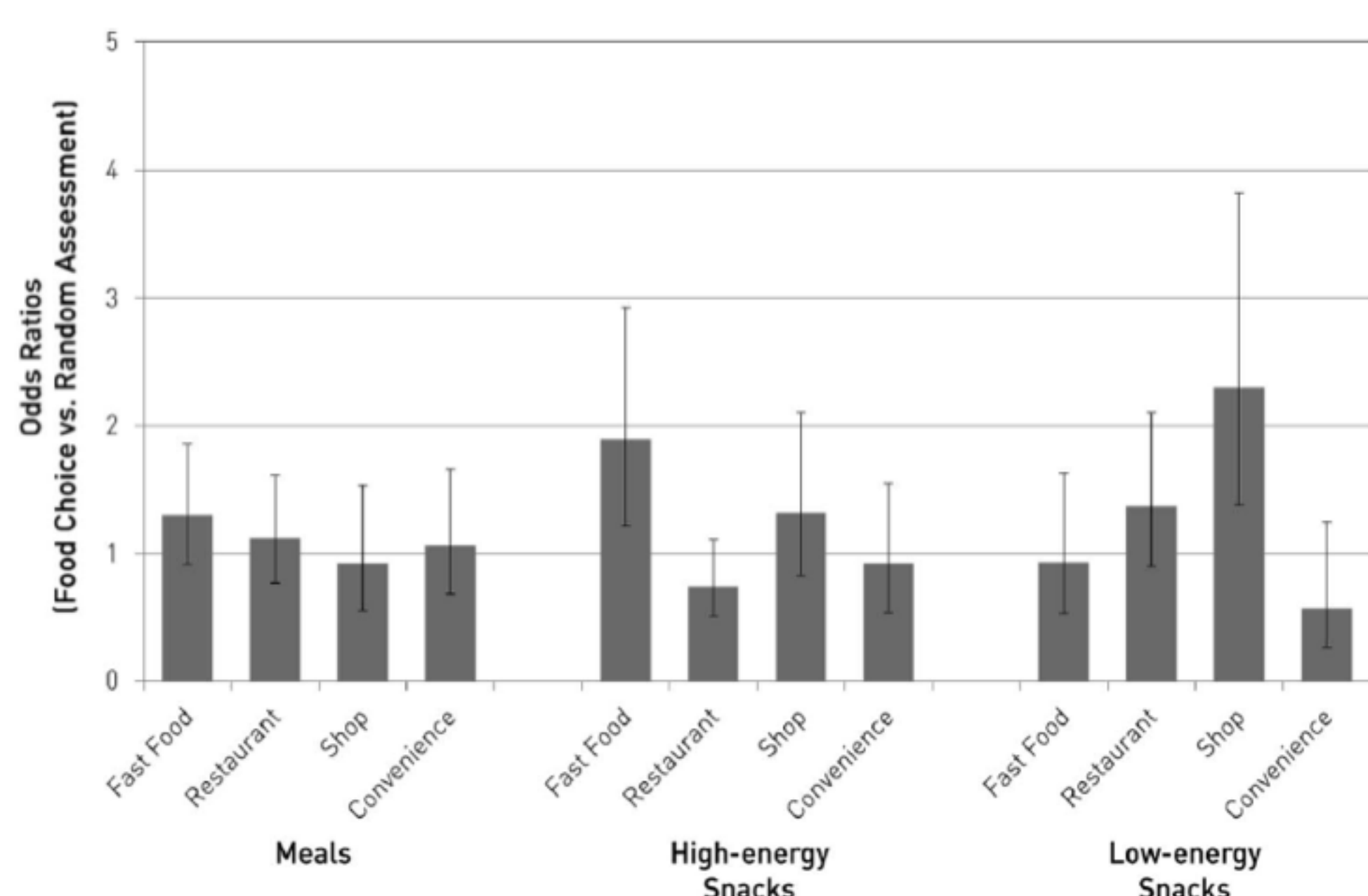
Results so far

Figure 1. Illustration of the influence of food environments on snacking. The figure shows an odds ratios of the presence of food outlets predicting food choices (source: Elliston, Ferguson, Schüz and Schüz, 2016)

Figure 2. Heat map of food outlet density in Hobart and GPS stamps of a participants location recorded throughout the monitoring period

Figure 3. Two participants GPS location with a 50m radius encompassing nearby food outlets. The participant on the top left is close to six food outlets, whereas the participant at the bottom right does not have any food outlets nearby. Based on this information, we would expect that the person at the top is more likely to be eating than the person at the bottom.

Questions

- Questions we hope to answer from this study:
    1. Can we predict eating based on an individual's location?
    2. Does food intake/craving change depending on what food outlets are nearby?
    3. Do individuals need to consciously recognise what food outlets are nearby in order to be influenced by their presence, or does just being in certain environments influence eating/hunger/craving levels?

- If passively knowing an individual's location is sufficient to predict eating, mHeath apps may be able to use personalised dietary interventions when individuals enter locations where they are at risk of dietary lapses
    - e.g. if an individual consistently snacks at fast food outlets, we could monitor their location via automatic GPS recordings and send through dietary interventions as they enter environments where fast food outlets are nearby

References:
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