Psychological Maps

An Investigation into Individuals Movements and Future Behaviour

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Introduction

Psychologists have questioned which source of information would best inform about who a person is. Raymond Cattel (1958) argued that people differ in the degree to which they wish to present themselves in the best light, which confounds efforts about attempting to understand individuals. Therefore, the most valuable source of data employed would be the most difficult to manipulate. Observing how people behave in their normal daily life was considered more objective than laboratory studies and questionnaires.

This recommendation was not widely adopted by psychologists focused on personality as the method was highly labour intensive and ultimately unhelpful for individuals attempting to implement psychological research. However, due to advances in smartphone technology, psychologists now may employ a multitude of sensors which are employed by a smartphone to get accounts of how people live. Sources of information can include: where people go, how people interact with others digitally, what is the context of the behaviour and other details about ambient noise, temperature or light exposure.

To test this concept, we devised an experiment investigating if we can distinguish between introverted and extroverted individuals by analysing their movements across a two week period. Furthermore, we are interested in testing if smartphones can offer better predictions of relevant future behaviour than self-report personality measures, as Cattel predicted.

Method

The 28 participants will be recruited from a poster campaign. They will be requested to complete an online survey that takes basic details about their course of study and any formal pressures upon where they will spend their time (e.g., employment positions, amount of contact hours in class). They will only answer if these pressures push them into areas which would be considered social venues (restaurants, bars, cafes or residential settings). They are also prompted to complete a personality inventory (HEXACO; Ashton & Lee, 2009). Finally, participants will install a location logging mobile application (peg log).

The peg log application (which can be found on Google Play) was developed as existing apps employed for research are commonly unmaintained, unfunctional or not publicly available. Commercially available apps are not usually suitable for location logging for long term secure data collection. We were able to construct an app that returns the most accurate location signal from either: Wi-Fi, GPS or cellular networks every minute to get a measure of latitude, longitude, accuracy rate and a timestamp. This data would then be placed in a secure encrypted database.

After the location recording period the participant will be involved in a group task with two to four other participants. Participants will be sat around a large table and informed that they need to remain there for the next twenty-five minutes. Participants are given materials to colour with.

peg log.1

Participants are informed that they do not need to colour or talk for the duration of the time and can freely talk if they so wish. They are also told that they will be filmed for the duration of their time there.

The intention is to foster a situation where the core of a participant's extroversion can be expressed (Ashton, Lee, Paunonen, 2002). Conversing with other participants will only done for its own sake. Participants willingness to engage in discussions also relates to their confidence regarding their disregard for being filmed, which relates to extraversion.
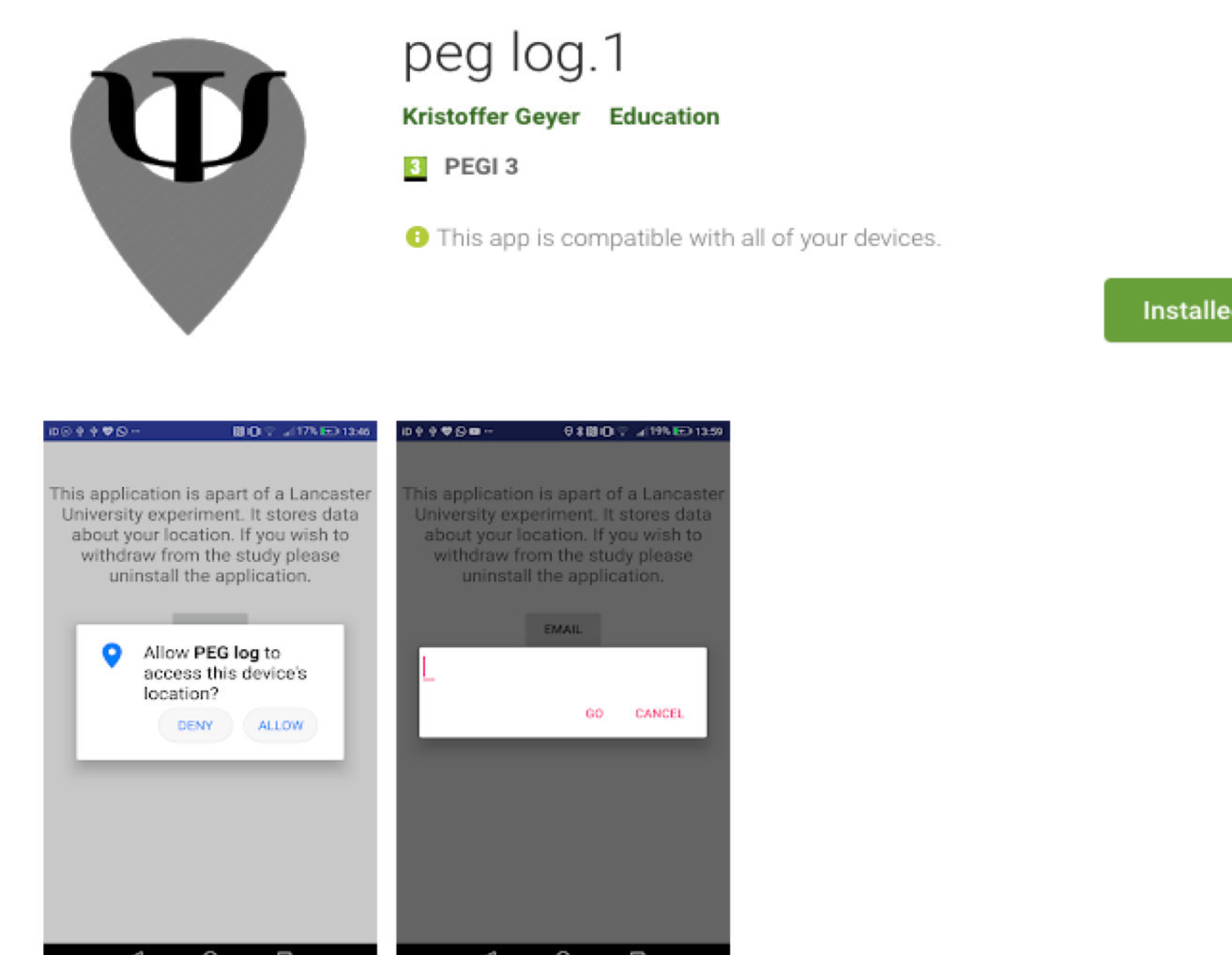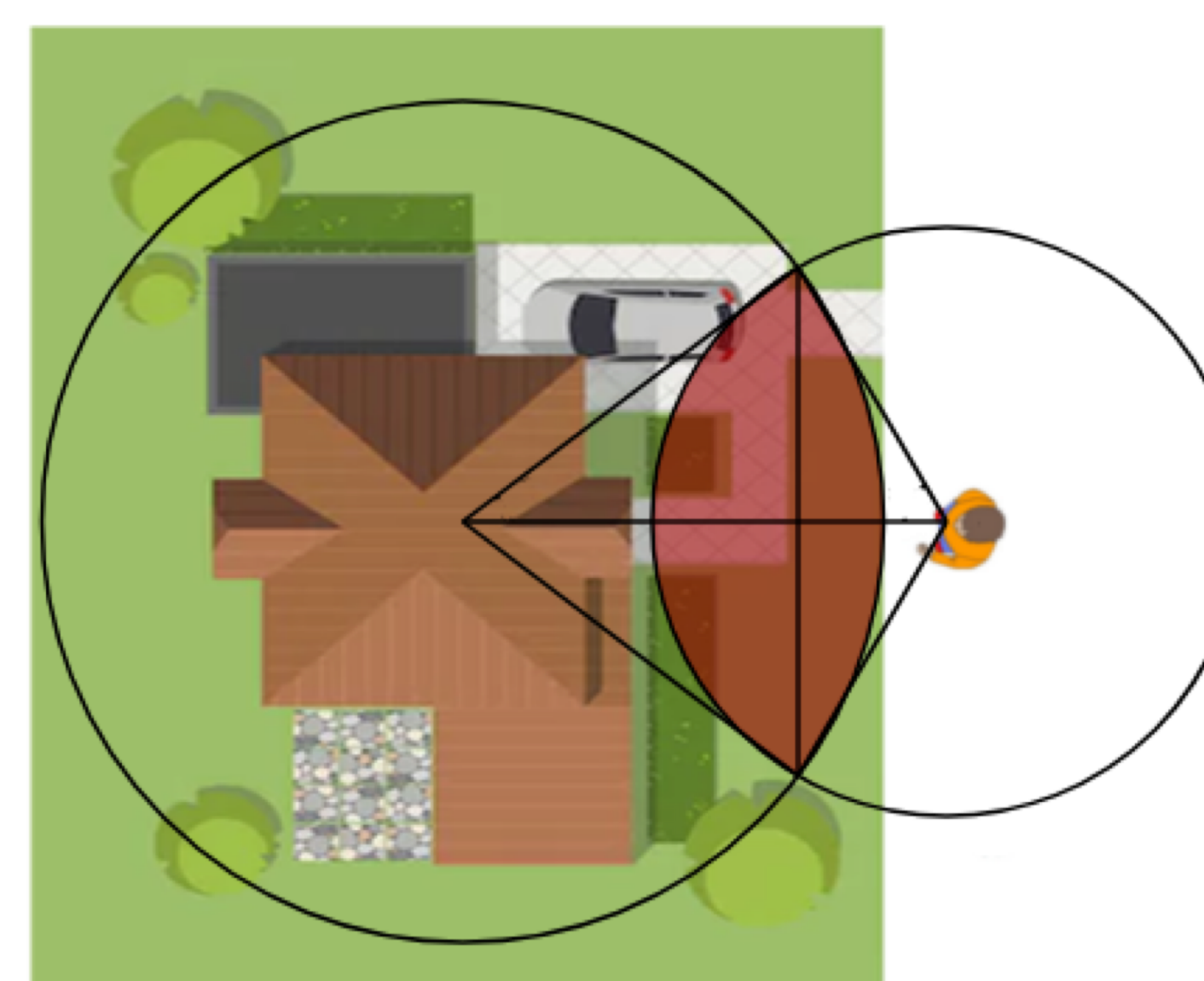
Analysis - location
Two major sources of information are anticipated to identify who is extrovert or introvert:

- Extroverts will access a greater variety of locations
- Extroverts will spend a greater duration of time in social venues

Data reduction method
If location readings have a low degree of accuracy, how can we be certain that a person is in a particular area?

To analyse the variety of time spent in a location we will be using a data reduction method by taking advantage of the accuracy level provided by the smartphone application. The accuracy will be dependent on a lot of features: signal available, satellites around, weather, etc. Then we will see if the distance between two points is greater than the combined value of the accuracy, so we can be sure that the points don't overlap. This will provide an account of all the different areas occupied which may provide insights into a person's level of extroversion.

To identify the time spent in the particular areas inside social venues, we will generate a database of residence and businesses which facilitate socialising. Each participant's location log will be compared with the database to identify the duration of time spent at such locations. The issue of inaccurate readings will be overcome by duration of time spent being multiplied by the confidence that one of these locations was accessed.
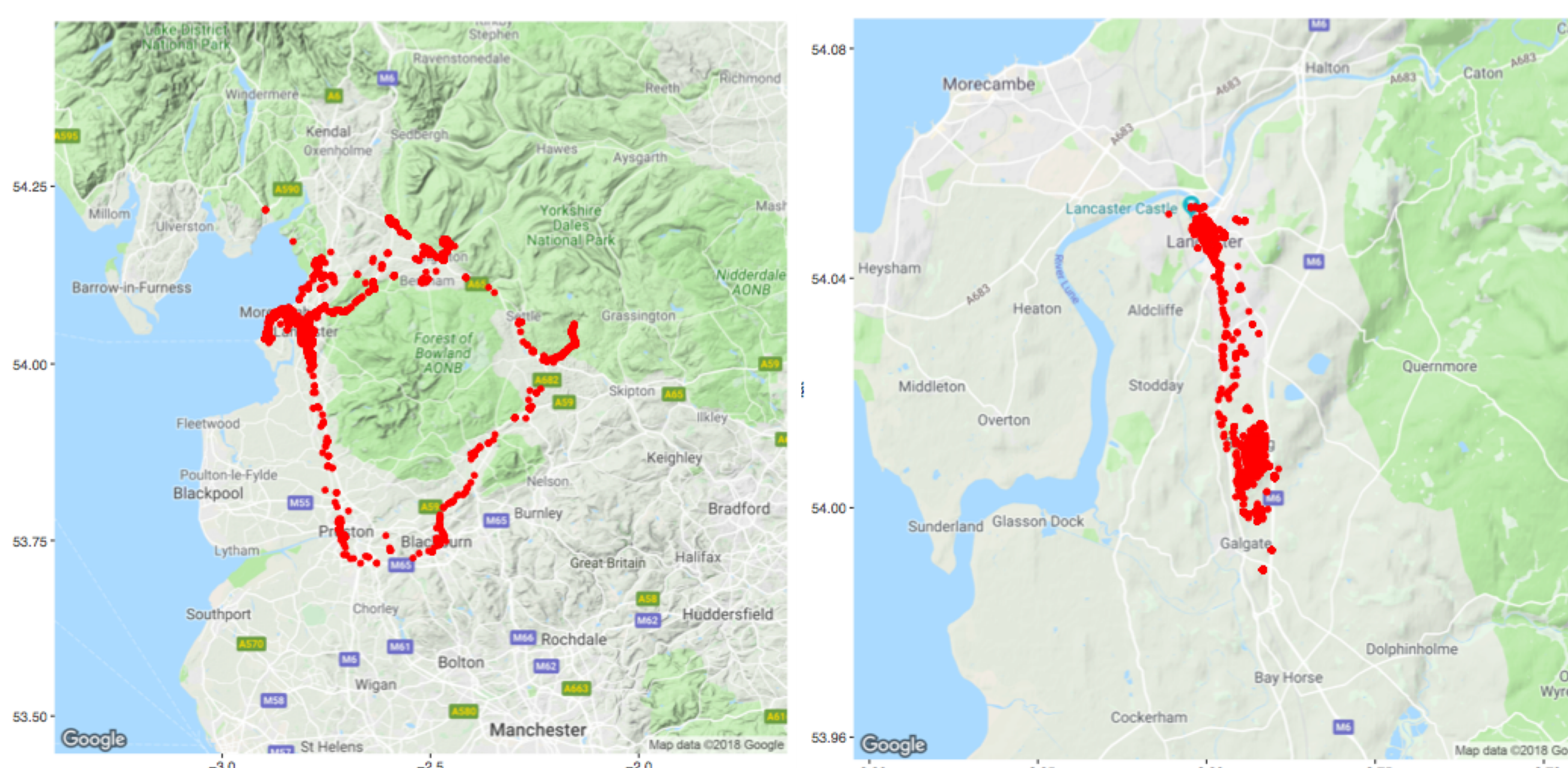
Analysis - colouring
The period of the time that each of the participant spent talking will be coded by the PI. A second coder will code 25% of the transcripts. If the coding of the two raters is not sufficiently similar (>90%) then the source of disagreement will be identified, established and accounted for when participants are reattempting to code for the duration of the time speaking.

Implications

This work has the potential to empower psychologists to better understand individuals' personality. Understanding someone's personality could aid to understand how they may act in the future. Therefore, this research could aid criminal investigations, rehabilitation, preventative policing and within many other aspects of criminal justice tasks.

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