

POPULATION MOBILITY

OPR graduate student John Palmer, Espenshade, Matt Salganik (Sociology), and Chang Chung have begun a new project titled *The Mobile Phone as a Social Science Research Tool*. Questions of human location and movement are central to many areas of demography, sociology, and other disciplines, and yet our answers are limited by our frequent inability to observe and measure where people are and where they are going. Census data tell us about general patterns of human settlement and migration, but very little about where people spend their time or where and how they travel. While we can study aggregations of individuals' reported places of residence, we know almost nothing about the location of these individuals at any given point in time. Interviews and surveys give us more detail, but these are constrained by scale and self-reporting errors. We are thus confronted with an important obstacle as we try to better understand a wide range of human activity, from immigration and urbanization to social networks and cultural capital distribution.

The increasing worldwide popularity and sophistication of cell phones offers a way around this obstacle. The research potential of these devices in many social science areas is quickly becoming apparent, and the possibilities for using them to track location and movement seem especially promising. Cell phones have long been a potential source of location and movement data because a given phone generally can be traced to the cell tower with which it is in closest proximity, and its movement can be roughly estimated by analyzing the phone's transitions from one tower to another. More accurate data may be obtained if a phone is able to triangulate its location based on the signals sent from systems of fixed satellites, such as the Global Positioning System (GPS). Phones with this capability have recently entered the market and are gaining widespread use.

This collaborative research project involves faculty, graduate students, and undergraduates in Computer Science, Electrical Engineering, OPR, Sociology, and the WWS. Its broad aim is to extend a pilot study on the use of T-Mobile's G1 phone and Google's Android platform to track human location and movement. The objectives are to (1) develop an Android-based application for recording and transmitting data from the phone's internal GPS receiver, wireless network interface, compass, and accelerometer, (2) develop a central system for collecting and analyzing such data, (3) evaluate the strengths and limitations of both the G1 hardware and the Android platform through a small scale, campus-based trial, and (4) develop a strategy for large scale testing and research.