Sensor data: Measuring acceleration of smartphones in mobile web surveys

The use of mobile devices, such as smartphones, in web survey responding has increased markedly. This technical-driven trend in survey responding allows surveyors to collect JavaScript-based paradata that can be used to describe response behavior. It also allows to gather sensor data (e.g., acceleration), all of which collect data that recognize user actions. Similar to paradata, sensor data can be passively collected by means of JavaScript.

We developed “SurveyMotion (SM),” a JavaScript-based tool that measures the motion level of smartphones. Technically speaking, SM gathers the total acceleration (TA). We conducted a cross-sectional web survey with $N = 2,357$ respondents (no device randomization). 61.6% of the respondents used a smartphone to complete the survey.

The study contains data from 29 smartphone manufacturers, 208 smartphone models, and 13 Internet browsers. Only for 2.8% ($n = 41$) of the respondents no motion data (i.e., acceleration) could be measured.

A closer look at the user-agent-strings of these respondents’ sheds light on the matter. In sum, three main reasons could be identified for unsuccessful measurement: (1) Inactivated JavaScript, (2) device-related issues (e.g., comparatively old or low budget devices), and (3) browser-related issues (e.g., comparatively old browser versions).

It seems that the collection of JavaScript-based sensor data (i.e., acceleration) in mobile web surveys is an achievable and promising new way to research response behavior and completion conditions.