ABSTRACT

Smartphones and mobile fitness applications or apps have brought a new experience to physical activities such as running, walking, and cycling. Increased sharing of these activities by users of social networking sites affords the collection of large physical activity datasets. This study assesses to what extent raw data from mobile fitness applications (MFAs) posted on Twitter can be used for studying physical activity and what added value they can provide. A total of 22,258 tweets collected over a nine-month period using RunKeeper mobile fitness app were analyzed. A quantitative analysis of the entire data set and a content analysis of a subset of 2,868 tweets were performed. The data from MFAs exchanged via Twitter provided rich information on various aspects of physical activity including timing and distance of runs, bicycle rides, and walks. Personal reflections shared by RunKeeper users contained additional details on how the activity was experienced. Although further research is needed to determine the representativeness and generalizability of such data, the results of this study may indicate an important direction for extending current methodological practices in physical activity research.

Keywords: Application Programming Interface (API), Mobile Fitness Apps (MFAs), Physical Activity Research, Social Media, Social Networking Sites

INTRODUCTION

Smartphones and mobile fitness applications or apps (MFAs) have brought a new experience to physical activities such as running, walking, and cycling. Furthermore, the emergence of mobile technologies and, more specifically, the rapid diffusion of smartphones offer new opportunities not only for tracking physical activity but also for scholarly research. A phone with integrated GPS modules and combined with accelerometers and wireless data transfer

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capabilities, offers a large potential for objective data collection. The development of smartphone applications has considerably amplified this potential. As a result, various types of mobile applications for healthcare are currently available in application stores (Pagoto & Bennett, 2013; West et al., 2012).

One type of application of particular interest is a mobile fitness application. Mobile fitness applications or apps use built-in global positioning system (GPS) capabilities of smartphones to track the distance and speed of activities of the smartphone owner such as running sessions, bicycle rides, and walks. Users can then upload the data to their online profiles on specific fitness-oriented social networks. Using online social networking platforms such as Daily Mile, Map My Fitness, and RunKeeper, users can set specific fitness objectives, monitor their progress, and share their fitness activities with others.

Facebook and Twitter users can also announce the activities they engage in with their friends and followers. “Just completed a 7.13 km run with @RunKeeper. Check it out! #RunKeeper,” is a typical physical activity report that is frequently posted on social networks and originates from RunKeeper.com, a popular fitness-focused social networking site. The RunKeeper GPS app for fitness tracking provides a platform for managing and sharing fitness activities using iOS and Android based mobile devices. The RunKeeper fitness community has over 25 million members throughout the world.

This article describes a method for gathering raw data on physical activity exchanged via Twitter by fitness communities by using of the RunKeeper mobile fitness app. The authors review existing research methods for gathering physical activity data and reflect on the process of data collection, including the development of a custom PHP script and a mixed-method approach for data analysis. The advantages of capturing physical activity data without recruiting research participants, limitations, and directions for future research are discussed.

**RESEARCH METHODS IN PHYSICAL ACTIVITY**

A review of the relevant literature indicates the existence of a wide range of research methods and data collection techniques that are applied to the study of physical activity. Among them, self-reporting methods, observational methods, and the use of objective measurement devices are among the most common (Strath et al., 2013; Thomas, Nelson, & Silverman, 2010). A combination of these methods is often used.

Self-reporting methods, as the name indicates, rely on research participants to provide accurate responses to questions regarding behavior or attitudes. Self-reporting methods such as quantitative surveys, for example, International Physical Activity Questionnaire (IPAQ) can afford relatively fast, low-cost, and large scale data collection (Booth, Ainsworth, & Pratt, 2003; Hagstromer, Oja, & Sjostrom, 2006; Hallal & Victora, 2004; van Poppel, Chinapaw, Mokkink, Van Mechelen, & Terwee, 2010). The accuracy and trustworthiness of the responses, however, can be an issue due to reliance on the research participant’s memory (Trost, Pate, Freedson, Sallis, & Taylor, 2000; Prince et al., 2008), potentially socially desirable answers (Shephard, 2003). Various standardized physical activity questionnaires exist, of which IPAQ is commonly used (Booth, Ainsworth, & Pratt, 2003).

With observational methods, the researcher is present in the direct environment of the research subjects in order to observe factors including but not limited to context, location, or intensity of behavior (Trost, Sirard, Dowda, Pfeiffer, & Pate, 2003). Although these observational methods have the advantage over self-reporting methods in that they allow the researcher to register what the research subjects actually “do” and not what they “say they do,” the main drawback is the obtrusiveness caused by the presence of the researcher which can cause the research subjects to behave differently.
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