Mobile Fitness Apps and Twitter – A Systemic Review

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Abstract

This research aims to create/leverage correlations between online social networking and effective exercise motivation and adherence. There is a substantial body of research regarding social networking and increased physical activity, but little regarding the effective usage of advanced web technologies to address exercise adherence. This would be relevant as 50% of people drop out of exercise programs within six months. We propose to incorporate mobile fitness application technologies and Twitter in exercise-oriented social networks to provide an interoperable historical record of one's exercise adherence. These types of exchanges can occur between trusted peers, and can also be used to power collaborative feedback mechanisms. In just over three months of data collection, we have collected and processed over 1,650,000 mobile fitness app Tweets.

Keywords
Physical activity, exercise, online social networking, Twitter

1. Introduction

Obesity and lack of physical exercise continues to be a drain in today's society, adversely affecting human health and thus leading to the necessity of medical care and a destructive impact on human well-being and productivity [1]. Medical research has shown the correlation between physical inactivity and several medical conditions and health problems [2].

2. Physical Activity

Howley (2001) defines physical activity as "bodily movement produced by skeletal muscles that require energy expenditure at a level to produce health benefits". Regular physical activity has long been regarded as an important component of a healthy lifestyle. This impression has been reinforced by scientific evidence linking regular physical activity to a wide array of physical and mental health benefits, yet despite this evidence and the public's apparent acceptance of the importance of physical activity, millions of adults remain essentially sedentary (Pate et al., 1995). In the United States, the costs associated with the burden of inactivity has surpassed an annual cost of $76 billion, and given the growing prevalence of physical inactivity among Americans, these costs are expected to increase even further (Almeida, 2008).

Effective interventions to promote physical activity have been identified, but the implementation of these interventions remains a challenge. The growing prevalence of conditions associated with physical inactivity has led to an urgent need to identify strategies that may increase physical activity levels among the United States population. The lack of physical activity has been formally recognized as a serious public health burden associated with increased risk for many chronic disease states, such as cardiovascular disease, diabetes, obesity, and some cancers (Almeida, 2008). In 2008, a consortium led by the United States Federal Government released an evidence-based, ten year national objectives report titled Health People 2020. As part of this report, fifteen national guidelines were established that provide objectives supporting the health benefits of regular physical activity among youth and adults, including participation in moderate and vigorous physical activities and muscle-strengthening activities (Healthy People 2020).

Research for the report suggests that more than 80% of adults do not meet the guidelines for both aerobic and muscle-strengthening activities. Of greater concern, more than 80% of adolescents fail to meet the physical activity guidelines for youth (Healthy People 2020).

3. **Online social networks and health**

Christakis and Fowler (2009) [3] suggest that "people are inter-connected and so their health is inter-connected. Inter-personal health effects in social networks provide a new foundation for public health". As online connections between people become ever more interweaved with offline real-world interests, social networking methods are moving toward simulating real-life social interactions, including physical activity, health and disease management. Rather than randomly approaching each other, people meet through things they have in common [4].

Health economist Jane Sarasohn-Kahn suggests that "health-related social technologies capture the exchange of health information and personal stories in a way that transcends both medical textbooks and chatting with a friend on the phone – yet offers some of the benefits of both" (Fox & Jones, 2009). With recent advancements in technology, interest in social network analysis has risen. It is now possible to calculate solutions to historically logistical challenges, which has led to an expanded application of social networks and an increase in the number of new methods for analyzing networks (O'Malley & Marsden, 2008).

4. **Mobile fitness apps**

While there are various personal devices that monitor/track a person's exercise characteristics (e.g. Body Media, Fitbit, MapMyFitness, Nike+, etc.), the effectiveness of online sharing via social networks of one's physical activity is limited in scientific research. Studies have indicated that "lack of motivation" is a key factor in why a person does not exercise. One factor to address is the relationship between participant and provider (i.e. personal trainer) and/or participant and social network, including their influence. People join gyms not only for health and fitness, but also for the social atmosphere. To fully understand the power of combining social networking and exercise adherence, the physical barrier of the four walls of an exercise facility is removed and technology is used that enables a measurable improvement towards one's fitness goals.

5. **Research Objectives**

This study will research the use of social and mobile technologies and its ability to address motivation and thus increase exercise adherence/general health. To achieve this goal, our research will consist of:

- State-of-the-art review of five (5) mobile fitness apps;
- Tweet and Twitter user analysis.

6. **Methodology for collection of Twitter information**

To effectively gather and analyze the vast amount of Twitter related information, collection and analytical tools were needed including a tweet collection tool and a Twitter interface to build a database of publicly available data (see Figure 1).

The cloud based application called TwapperKeeper was used for Tweet data collection specific to mobile fitness apps (MFA) hashtags, while the Wang Fitness Tweet API was used to gather information that correlated MFA tweeters and their publicly available demographic data.
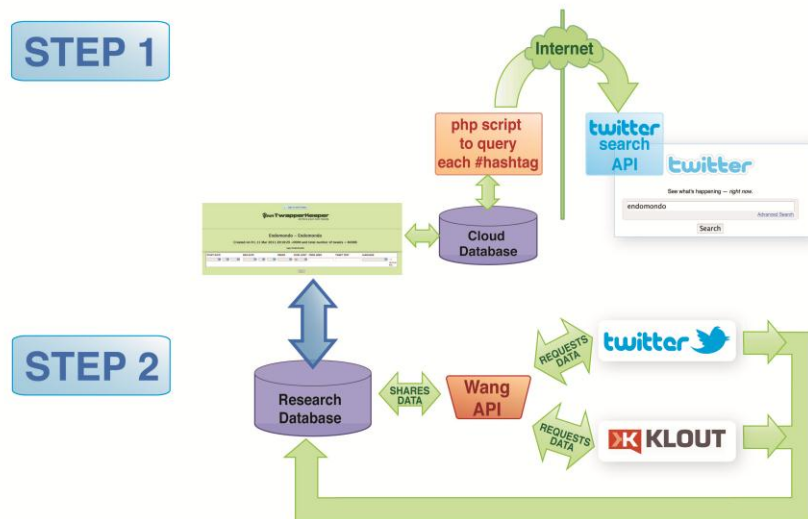
Figure 1 - Twitter data collection model

7. Results and Conclusions

The data shows that by tracking mobile fitness app hashtags, a wealth of information can be gathered to include but not limited to exercise frequency, daily use patterns, location based workouts and language characteristics. While a majority of these hashtags are to share a specific workout with their Twitter social networking, the data would suggest other reasons for sharing as well.

8. Discussion

Online social networks are dichotomous with its relationship to exercise and fitness. On the one hand, individuals can become even more sedentary by being tied to their computer station in order to remain with their network. On the other hand, with the advent of mobile devices able to manage a plethora of applications, persons are able to become more active and stay in touch with their community. This review serves to analyze those who are using their SN to affect behavior with respect to activity, so is in essence self-selective. It will have limited ability to track changes in behavior of those who are not already active either in SN or physical activity, except in those cases where they are introduced to it by their community. While it seems apparent that it can affect the quality of the fitness activity within a network, it still begs the question as to whether it can affect the unique index quantity overall.

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