



## “Working out for likes”: An empirical study on social influence in exercise gamification



Juho Hamari, Jonna Koivisto\*

Game Research Lab, School of Information Sciences, FIN-33014 University of Tampere, Finland

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### ABSTRACT

Today, people use a variety of social and gameful (mobile) applications in order to motivate themselves and others to maintain difficult habits such as exercise, sustainable consumption and healthy eating. However, we have yet lacked understanding of how social influence affects willingness to maintain these difficult habits with the help of gamification services. In order to investigate this phenomenon, we measured how social influence predicts attitudes, use and further exercise in the context of gamification of exercise. Our results show that people indeed do “work out for likes”, or in other words, social influence, positive recognition and reciprocity have a positive impact on how much people are willing to exercise as well as their attitudes and willingness to use gamification services. Moreover, we found that the more friends a user has in the service, the larger the effects are. Furthermore, the findings of the empirical study further provide new understanding on the phenomenon of social influence in technology adoption/use continuance in general by showing, in addition to subjective norms, how getting recognized, receiving reciprocal benefits and network effects contribute to use continuance.

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### 1. Introduction

In their daily lives, people are often ridden with a tendency to favour short-term rewards instead of long-term rewards. This cognitive bias, titled hyperbolic discounting (Ainslie, 1975), leads us to sometimes neglect behaviours that would be beneficial to us and consequently causes us to, for example, procrastinate, skip exercise, smoke, and overconsume. When trying to break these cycles, a strong willpower is not always enough, and therefore, people are constantly seeking for novel ways to motivate themselves. During the last couple of years, new technological approaches for these motivational problems have been introduced. For example applications for fitness (Fitocracy; Zombies, Run!), housekeeping (Chore Wars), and even keeping up with one’s aspirations in life (Mindbloom) all attempt to motivate people by restructuring relatively long-term goals by providing the users with short-term goals, activities, rewards and social support.

This emerging technological approach for motivating people toward different types of beneficial behaviours draws from the design of social network services as well as games and has commonly been titled as gamification which refers to implementation of elements familiar from games to create similar experiences as games commonly do (Deterring, Dixon, Khaled, & Nacke, 2011;

Hamari, Huotari, & Tolvanen, 2015). Such features have thus far been implemented in various contexts (Hamari, Koivisto, & Sarsa, 2014). Furthermore, very positive views and perhaps even unwarranted expectations regarding gamification have been expressed (see e.g. IEEE, 2014). However, doubts have also been cast on the concept and its effectiveness in truly motivating people (Gartner, 2012). Thus far, meta-studies indicate that most studies do report positive findings from gamification implementations. However, understanding over what kind of gamification works, which psychological aspects mediate the effects, and in which contexts the approach can be beneficial is not yet sufficient (Hamari et al., 2014). Nevertheless, the amount of research on the topic is rapidly increasing (Hamari et al., 2014), and to further highlight the timeliness of these developments, business analyses by Gartner (2011) and IEEE (2014) have reported predictions that the number of gamification endeavours will be increasing considerably in the coming years.

Moreover, common to many such motivational applications is the attempt to employ social influence through a user community in order to entice people to maintain their sustainable behaviour. The generally increased use of social features in technologies can also be observed elsewhere. People adopt technologies increasingly through word-of-mouth (Cheung & Thadani, 2012) or different kinds of recommendation systems (Li, Wu, & Lai, 2013; Stibe, Oinas-Kukkonen, & Lehto, 2013; Xiao & Benbasat, 2007) as well as consume socially (Zhou, Zhang, & Zimmermann, 2013).

\* Corresponding author. Tel.: +358 50 318 73 63.

E-mail address: [jonna.koivisto@uta.fi](mailto:jonna.koivisto@uta.fi) (J. Koivisto).

Moreover, social networking services frequently expose people to opinions and attitudes of others, which may further influence the behaviour of the participants (see e.g. Zhou, 2011). While the number of technological approaches invoking social influence and related psychological phenomena for steering human behaviour towards sustainable, healthy, and otherwise beneficial behaviours is growing, research-based knowledge on whether these technological solutions with social features are able to actually motivate people to pick up and continue with the encouraged behaviours is still somewhat scarce.

Therefore, in this study we investigate how social influence aids people in continuing and maintaining the beneficial behaviours promoted by the gamification technology. We specifically focus on one category of beneficial behaviour; namely physical exercise and the gamification service devised to encourage such behaviour. In particular, in this study we seek to magnify 'social influence' and investigate how several social factors work in parallel to increase willingness to use gamification and continue exercising. We compose the social influence from four factors: (1) subjective norms, (2) recognition from accepting the social influence, and (3) perceived reciprocal benefits. As an antecedent to social influence we measure (4) network effects (in order to investigate on which aspects of social influence having a larger network affects). The theorization expands upon the traditional measurement of social influence by extending the widely employed models, the theories of reasoned action (TRA) and planned behaviour (TPB). The study employs data gathered through an online survey from the users of an exercise-related gamification service.

## 2. Theory and background

### 2.1. Gamification

So far, the gamification approach (Deterding et al., 2011; Hamari et al., 2015) has been harnessed and studied, for example, in the domains of education (e.g. Bonde et al., 2014; Christy & Fox, 2014; de-Marcos, Domínguez, Saenz-de-Navarrete, & Pagés, 2014; Denny, 2013; Domínguez et al., 2013; Farzan & Brusilovsky, 2011; Filsecker & Hickey, 2014; Hakulinen, Auvinen, & Korhonen, 2013; Simões, Díaz Redondo, & Fernández Vilas, 2013), commerce (Hamari, 2013, 2015), intra-organizational communication and activity (Farzan et al., 2008a, 2008b; Thom, Millen, & DiMicco, 2012), government services (Bista, Nepal, Paris, & Colineau, 2014), public engagement (Tolmie, Chamberlain, & Benford, 2014), environmental behaviour (Lee, Ceyhan, Jordan-Cooley, & Sung, 2013; Lounis, Pramaturi, & Theotokis, 2014), marketing and advertising (Cechanowicz, Gutwin, Brownell, & Goodfellow, 2013; Terlutter & Capella, 2013), and activities such as crowdsourcing (Eickhoff, Harris, de Vries, & Srinivasan, 2012; Ipeirotis & Gabrilovich, 2014), to name a few.

In addition to the above mentioned domains, several studies have examined gamification in the context of this study: health and exercise. Table 1 outlines findings made in the area of gamification of exercise and health. The results of the studies indicate positive effects from gamification, for example, on physical activity (e.g. Chen & Pu, 2014; Chen, Zhang, & Pu, 2014), healthy eating habits (e.g. Jones, Madden, & Wengreen, 2014), as well as willingness to continue using the health-related system (e.g. Cafazzo, Casselman, Hamming, Katzman, & Palmert, 2012; Elias, Rajan, McArthur, & Dacso, 2013). However, some studies suggest that novelty effects might affect the perceptions of benefits from the gamification approaches (Koivisto & Hamari, 2014). Furthermore, the findings from studies conducted in the domain of gamification of health and exercise are somewhat in line with the results from literature examining the use video games for health benefits. A

review by Biddiss and Irwin (2010) reported that inconclusive results were found in terms of significantly increasing physical activity. However, potential for effects from short-term interventions was noted indicating that, similarly to gamification implementations, benefits may be derived especially in the short-term due to novelty factors, but indications of long-term benefits are still scarce.

Regarding social aspects in gamification of health and exercise particularly, for example, Chen and Pu (2014) and Chen et al. (2014) studied social features in an exercise gamification context with the aim of increasing physical activity. They experimented with social conditions of cooperation, competition and a hybrid setting with features of both of the previous. In their studies, the social conditions did increase physical activity when compared to exercising alone. Of the conditions, the cooperation setting lead to most positive effects. Furthermore, the findings of the controlled trial study by Allam, Kostova, Nakamoto, and Schulz (2015) indicated that a combination of gamification and social support features implemented in their web-based intervention increased physical activity. Therefore, the studies by Chen and Pu (2014), Chen et al. (2014), and Allam et al. (2015) suggest that social aspects and especially supportive social interactions could have an important effect in motivating users towards behaviours with gamification.

### 2.2. Social influence in social psychology

Human beings have a psychological need for experiencing relatedness (Deci & Ryan, 2000; Ryan & Deci, 2000), which refers to the needs of belonging and being connected with others. When these needs are fulfilled in a given context, the experienced relatedness may increase intrinsic motivations toward activities related to that context (Ryan & Deci, 2000; Zhang, 2008). In other words, for example in the information technology context, experiencing relatedness through the use of a system potentially makes the user more willing to engage with the system and continue using it (Zhang, 2008).

One method for creating such senses of relatedness is by organizing into groups. Groups form around mutual goals and through different stages of group formation usually develop to share mutual norms which are an important antecedent for group cohesion (Tuckman, 1965). The process of group cohesion is revealed in the tendency of a group of people to stay together and pursue some instrumental objectives, and thus, reciprocally benefit from the social community (Carron & Brawley, 2000).

Becoming a member of a social community may thus lead to individuals being affected by the social influence from others. Depending on whether the individual wishes to become part of the social community, he or she may accept the social influence, for example, the diffusion of the behavioural norms of the community that are communicated through the process of signalling the norms (Ajzen, 1988, 1991; Fishbein, 1979). Depending on whether the individual accepts the norms, the social community provides feedback to the individual on his or her behaviour (Hernandez, Montaner, Sese, & Urquiza, 2011; Lin, 2008). In case the individual has accepted the social influence and has received positive feedback from the relevant community, this may further lead to satisfaction for the individual who is conforming and complying with the norms (Kelman, 1958; Lin, 2008; Lindenberg, 2001).

Theories on group formation (Tuckman, 1965), relatedness regarding emergence of intrinsic motivations (Ryan & Deci, 2000) and social influence (Cialdini, Green, & Rusch, 1992; Kelman, 1958) suggest that social influence also includes the *affective experience* derived from gaining *recognition* from accepting and conforming with the social influence. The fulfilment of needs of relatedness essential to intrinsic motivation requires a supportive

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