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# How games induce cooperation? A study on the relationship between game features and we-intentions in an augmented reality game

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A B S T R A C T

Seamless cooperation between individuals is essentially a crucial aspect of any successful endeavor. A host of literature has been published in the academic realm about how cooperation could be cultivated. However, true cooperation often forms organically without external enforcement. Recently, there has been one special example of a context where cooperation seemed to have effortlessly sprung up between people who might not even have had previous connections. The context is *video/online games*; games such as *Ingress, Pokémon Go*, and *World of Warcraft* bind people together to work against insurmountable odds and to overcome jointly held challenges. Organizations of many types have recently begun to *gamify* their structures and services in order to cultivate such seamless cooperation. However, before this potential of games can be successfully wielded outside video games, we need to understand better how games are able to cultivate such cooperation. Therefore, in this study we investigate how games can induce and cultivate *we-intention* of working as a group. Specifically, we investigate how cooperative game features affect different forms of group dynamics and how they further translate into we-intentions. We employ data from users of the augmented reality game Ingress (N = 206). The results show that cooperative game features induce we-intentions via positively increasing group norms, social identity, joint commitment, attitudes toward cooperation, and anticipated positive emotions. The findings imply that practitioners who are looking to increase cooperation should find that gamification inspired by cooperative game design is beneficial and preferable over individual-based gamification efforts.

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## 1. Introduction

Cooperation is an anchor of our society and a key ability of people, who are working, studying, and carrying out most leisure activities together to achieve shared goals. During the past decade, modern information & communication technologies (ICT) that digitally connect people around the globe have birthed completely new forms of cooperation in organizations and beyond. A large variety of *collaborative technologies*, such as online communities (Hutter, Hautz, Füller, Mueller, & Matzler, 2011), crowdsourcing

platforms (Geiger & Schader, 2014), or instant messaging services (Shen, Cheung, & Lee, 2013) have emerged that facilitate working together anytime and across geographical borders. However, many studies report that it is challenging to motivate people to adopt and use such collaborative technologies (Arazy, Gellatly, Brainin, & Nov, 2016; Hutter et al., 2011; Lin & Bhattacherjee, 2008; Lin & Lu, 2011; Wasko & Faraj, 2005; Zhao & Zhu, 2014). Thus, much work has sought to understand which factors drive people to cooperate (Bagozzi & Dholakia, 2002, 2006; Tsai & Bagozzi, 2014) and how design features in information systems and services can support and cultivate cooperative behaviors (Jung, Schneider, & Valacich, 2010; Straub, Gimpel, Teschner, & Weinhardt, 2015; Valacich, Dennis, & Connolly, 1994; Zhang, Venkatesh, & Brown, 2011).

Concerning video games, it can be observed that, in many games, cooperation emerges effortlessly; people start to pool individual efforts, cooperate seamlessly even against the most unimaginable

odds, and express strong enthusiasm while acting together (Chen, Sun, & Hsieh, 2008; Cole & Griffiths, 2007; Ducheneaut, Yee, Nickell, & Moore, 2006; Scharkow, Festl, Vogelgesang, & Quandt, 2015; Teng & Chen, 2014; Yee, 2006). Thus, today, practitioners turn to games for inspiration on how to design information systems, services, and organizational structures more cooperatively (Bui, Veit, & Webster, 2015; Morschheuser, Maedche, & Walter, 2017; Ribeiro, Farinha, Pereira, & Mira da Silva, 2014; Schacht, & Maedche 2015; Thom, Millen, Dimicco, & Street, 2012). This trend can be understood as part of the *gamification* movement, which represents the use of game elements and mechanics outside traditional video game environments (Hamari, Koivisto, & Sarsa, 2014; Huotari & Hamari, 2017). Initial empirical studies indicate that applying game mechanics and features of cooperative games, such as point systems that reward cooperation (Blohm, Bretschneider, Leimeister, & Krcmar, 2011; Chen & Pu, 2014; Siu, Zook, & Riedl, 2014; Thom et al., 2012), team competitions (Chen & Pu, 2014; Peng & Hsieh, 2012), or virtual worlds with avatars (Rico, Martínez-Muñoz, Alaman, Camacho, & Pulido, 2011) can positively influence cooperation in various contexts. However, we still lack a comprehensive understanding of how games cultivate cooperation (Liu, Li, & Santhanam, 2013; Hamari & Keronen, 2017b; Morschheuser, Maedche, et al. 2017), which keeps us from successful wielding the potential of cooperative games in gamification (Bui et al., 2015; Liu, Santhanam, & Webster, 2017; Morschheuser, Hamari, & Koivisto 2017).

Recently, the concept of *we-intentions* has gained attention in information system (IS) research concerning understanding cooperation with collaborative technologies. Compared to typically studied individual intentions, the concept of we-intention relies on the idea that true cooperation requires collective intentions and therefore cannot be analyzed only as the sum of individual intentions (Searle, 1990; Tuomela, 2000). The concept is increasingly gaining attention in IS research, in order to study cooperation and cooperative behaviors in online communities (Bagozzi & Dholakia, 2002; Cheung & Lee, 2010; Dholakia, Bagozzi, & Pearo, 2004; Shen, Cheung, Lee, & Chen, 2011; Shen et al., 2013; Tsai & Bagozzi, 2014) and crowdsourcing systems (Bagozzi & Dholakia, 2006; Shen, Lee, & Cheung, 2014; Shen, Lee, Cheung, & Chen, 2009). Owing to the strong similarities between such virtual communities and online games, this theoretical framework provides excellent support for investigating cooperation in games.

Therefore, in this paper, we empirically investigate how games cultivate we-intentions of working as a group by drawing on cooperation theory (Tuomela, 2000) and particularly the concept of we-intentions (Bagozzi & Dholakia, 2002; Tsai & Bagozzi, 2014; Tuomela, 2000). On the basis of survey data, gathered in the context of the augmented reality game Ingress that engages people in generating an interactive map with cultural points of interest, we seek to enhance current understandings of how engagement with cooperative game features induce we-intentions via *group dynamics*, such as group norms, positive and negative anticipated emotions, social identity, joint commitment, and attitudes toward cooperation. Further, we investigate whether engagement with individualistic game features — such as private badges, points or levels — that are currently often used in the context of collaborative technologies (Hamari et al., 2014; Morschheuser, Hamari, & Koivisto, 2016) influence these effects. This paper summarizes this study's findings and discusses theoretical and practical implications.

## 2. Theoretical background and research model

### 2.1. We-intentions and their antecedents

Researchers have put much effort into theoretically conceptualizing and studying the phenomenon of *cooperation* from different perspectives, including philosophy (Gilbert, 1989; Tuomela, 2000), game theory (Nash, 1953), and social psychology (Johnson, 2003). Commonly, pure or *full-blown* cooperation is typically considered to consist of collective social actions, in which more than one person act jointly toward a common goal (e.g. carrying a table jointly) (Gilbert, 1989; Tuomela, 2000).

According to Tuomela (2000, 2011), such cooperation is characterized and determined by a collective *we-intention* of group members towards a shared goal. Thus, recently, studies have commonly drawn on the concept of *we-intention* (Searle, 1990; Tuomela, 2000, 2011) to operationalize cooperation in groups. In contrast to typically investigated personal intentions, which capture individual commitment to an action, we-intentions involve a 'we-perspective', expressing a collective commitment to participate in a cooperative action (Bratman, 1997; Searle, 1990; Tuomela, 2000, 2011). Therefore, we-intentions are explicitly formulated with reference to a collective entity of *we* or *us*, which expresses the intention to jointly perform an activity together with others: "We intend to do X jointly" (Bratman, 1997; Searle, 1990; Tuomela, 2000, 2011).

Since the inception of these conceptualizations, the *we-intentions*–operationalization has been applied in the study of cooperation in several technology-mediated contexts, such as wikis, crowdsourcing platforms, instant messaging services, and other social communities (Bagozzi & Dholakia, 2002, 2006; Shen et al., 2014; Tsai & Bagozzi, 2014). These studies have shown that we-intention is a strong proximal determinant of cooperation and provides a more comprehensive explanation of user participation in group efforts than traditionally investigated personal intentions.

Although the adoption and use of collaborative technologies have been frequently investigated in IS research (Lin & Bhattacherjee, 2008; Lin & Lu, 2011; Majchrzak, Rice, Malhotra, King, & Ba, 2000), studies have mostly investigated individual intentions (*i-intentions*). The we-intention concept has been largely overlooked by the repetitive application of theories such as the technology acceptance model (Davis, 1989), the theory of reasoned action (Fishbein & Ajzen, 1975), and the theory of planned behavior (Ajzen, 1991), all of which solely investigate intentions from an individual perspective. However, it is obvious that participation and cooperation in online communities and other collaborative technologies are commonly a group activity. Typically, users adopt and use such technologies for a common reason or to achieve a shared goal. Thus, cooperation in such collaborative technologies is increasingly investigated through the concept of we-intention in recent IS research (De Oliveira & Huertas, 2015; Shen et al., 2013; Tsai & Bagozzi, 2014). Guided by Bagozzi and Dholakia (Bagozzi & Dholakia, 2002, 2006; Dholakia et al., 2004; Tsai & Bagozzi, 2014), a variety of efforts have been made to empirically investigate the cooperation of users in social communities, crowdsourcing approaches, or instant messaging services (Table 1). A synthesis of extant research indicates that individual factors, such as attitudes (Tsai & Bagozzi, 2014) and anticipated emotions (Bagozzi & Dholakia, 2002; Tsai & Bagozzi, 2014) as well as social antecedents, such as joint commitment (Shen et al., 2009, 2014; Tuomela, 2000), social identity (Bagozzi & Dholakia, 2002; Tsai & Bagozzi, 2014), and group norms (Bagozzi & Dholakia, 2002; Tsai & Bagozzi, 2014; de Oliveira & Huertas, 2015) influence we-intentions to work together with collaborative technologies.

More importantly, it has remained unclear which features in these technologies are responsible for invoking we-intentions and how specific features can, in the end, engage more cooperation. Moreover, the particular context of cooperation in games and gamified approaches has been largely ignored in prior we-intention research.