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Social gaming is inSIDE: Impact of anonymity and group identity on performance in a team game-based learning environment



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ABSTRACT

The present experiment aimed to determine how quiz performance in a team game-based learning environment can be predicted from the Social Identity model of Deindividuation Effects (SIDE). According to this model, anonymity influences social behavior by accentuating the salience of group identity and reducing interpersonal differences, leading to greater group identification and motivation to work for one's own group. As these effects could lead to higher cognitive performance, the goal of the present research was to extend predictions based on the SIDE model on performance in online game-based learning environments. After measuring their prior computing knowledge, 343 Master Degree students were placed in virtual teams on a trivial criterion to perform a series of online quizzes about computing and the Internet. An anonymous (or individuated) username was attributed to each team member to connect to the online learning environment, and information about comparison between teams was used to manipulate the degree of salience of group identity (high versus low). As predicted by the SIDE model, anonymity boosted performance when group identity was salient, but only for students with low prior knowledge. Unexpectedly, it was also found that anonymity boosted the performance of students with high prior knowledge when group identity was not salient. A similar pattern was found for perceived mastery of computing and the Internet. Theoretical and practical implications of the SIDE model are discussed, and specifically its application to social gaming to optimize online learning.

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1. Introduction

One of the challenges of the 21st century is the growing need to help students develop skills and knowledge in computing and the Internet. This need is also crucial to prepare students to become teachers and use computers and other technologies efficiently inside and outside the classroom. However, students preparing to be future teachers, as well as teachers themselves, often have a lack of knowledge and skills in computing and the Internet. Indeed, a National Report on innovation in teaching practices using digital environments and their implications for teacher training revealed that only 37% of French teachers indicate being comfortable with information and communication technologies (ICT) (Fourgous, 2012). An IPSOS survey (2012) with a sample of 404 French teachers, questioned via the Internet about their teaching practices, revealed that 27% rarely or never used ICT in the classroom, and 27% of those reported a lack of training in this domain. Similarly, a study showed that only 28% of Canadian pre-service teachers felt comfortable using ICT after a Teacher Education Program (Martinovic & Zhang, 2012). A previous European survey conducted among teachers in 27 European countries found that 66% of respondents said they had used computers with their students in the classroom during the previous year, but 62% of them said they used them rarely, i.e., in less than 25% of their classes (Empirica, 2006). It is therefore important to find solutions to engage future teachers, and students in general, to acquire computing knowledge, and to develop skills to use ICT efficiently in the classroom. As our purpose was to increase performance and motivation to acquire computing knowledge, we examined the role of social and psychological processes, such as social comparison theory (Festinger, 1954) and its extensions to social identity theory (e.g., Abrams & Hogg, 1990; Tajfel, 1974, 1978; Tajfel & Turner, 1986) and self-categorization theory (e.g., Oakes, 1987; Oakes, Haslam, & Turner, 1994; Turner, 1982, 1987; Turner & Haslam, 2001; Turner,

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Oakes, Haslam, & McGarty, 1994; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). We postulated that these processes could be used as powerful social incentives for acquiring computing and Internet skills and knowledge.

More specifically, we based our study on a model derived from social identity theories: the Social Identity model of Deindividuation Effects (SIDE) (Reicher, Spears, & Postmes, 1995; Spears & Lea, 1992, 1994), which uses social identity and anonymity to bolster the identification to team, leading to higher implication for the sake of one's team. A common aspect of these social identity theories is that intergroup comparisons have a crucial impact on various attitudes and behaviors in social life, but only a few studies have examined their impact on cognitive performance and, to our knowledge, no study have been conducted in game-based learning environments.

Despite the great number of video games and serious games that have been developed for educational purposes (e.g., Arena & Schwartz, 2013; Coffman & Klinger, 2008; Eschenbrenner, Nah, & Siau, 2008; Squire & Barab, 2004; Warburton, 2009; see Young et al., 2012, for a review), only a small number are based on social psychology theories (Baldwin & Dandeneau, 2009). Instead, they are often designed intuitively from social processes such as competition to reinforce their attractiveness, and some use quizzes where teams compete against each other to attain learning objectives (Goldberg & Dintzis, 2007). More recently, it has been shown that giving students quizzes with formative feedback may increase self-evaluation, engagement, and exam performance (Balter, Enstrom, & Lingenberg, 2013). Similarly, delivering performance feedback based on social comparison processes may have similar beneficial effects for self-evaluation in learning environments. Such feedback can be delivered automatically and anonymously in the classroom using clicker devices (e.g., Fies & Marshal, 2006; Lantz & Stawiski, 2014), or remotely in digital game-based learning environments (e.g., Cameron & Dwyer, 2005; Erhel & Jamet, 2013; Jackson & McNamara, 2013; Ma, Oikonomou, & Jain, 2011; Wouters, van Nimwegen, van Oostendorp, & van der Spek, 2013). Consequently, performance feedback were used in the present study to test their impact on quiz performance in a team game-based learning environment aiming to motivate students to acquire computing and Internet knowledge.

1.1. Theoretical foundations of social identity theories

According to social identity theory (Tajfel, 1974, 1978; Tajfel & Turner, 1986; see Postmes & Branscombe, 2010, for a review), an individual's social identity is determined by the group to which he/she belongs. When individuals feel that they belong to a given group, they tend to establish comparisons between "them" and "us", in order to maintain an advantage of their group over other groups. It has been demonstrated that the mere categorization of people into distinct groups, even when based on trivial criteria, is sufficient to create a social identity for them (e.g., Tajfel, Billig, Bundy, & Flament, 1971).

Self-categorization theory (Turner, 1982; Turner et al., 1987) expands the idea that social identity processes are fundamental to understand group behaviors by distinguishing between social identity (self-definition in terms of social category membership) and personal identity (self-definition in terms of personal or idiosyncratic attributes). According to this theory, group identification leads individuals to perceive themselves in terms of the characteristics they share with other members of their in-group (their group or social identity) rather than in terms of the idiosyncratic characteristics that differentiate them from other individuals (their personal identity; Turner et al., 1987).

The Social Identity model of Deindividuation Effects (Reicher et al., 1995; Spears & Lea, 1992, 1994), which lies at the heart of the present study, extends previous theories and models of Computer-Mediated Communication (see Footnote¹), such as media richness theory (Daft & Lengel, 1984) and reduced social cues model (Kiesler, Siegel, & McGuire, 1984), by demonstrating that certain features of Internet communication, such as (visual) anonymity, may accentuate (and not reduce) the salience of possible social identities. Consequently, less attention is devoted to differences within the group and more attention is paid to similarities. In other words, according to the SIDE model, anonymity enhances the salience of social identity originating from intergroup comparisons and may have an influence on group members' attitudes and behaviors. Unfortunately, only a few studies to date have examined the impact of social identity and intergroup comparisons on cognitive performance (see Michinov, Michinov, & Toczek-Capelle, 2004; Tanis & Postmes, 2008).

1.2. Effects of intergroup comparison on performance

Social identity theories have always focused mainly on intergroup relations and favoritism toward one's group (e.g., Abrams & Hogg, 1990; Tajfel & Turner, 1986). Indeed, intergroup comparisons have been identified as having a crucial influence on various attitudes and behaviors, and more particularly on self-esteem (Lemyre & Smith, 1985; Marmarosh & Corazzini, 1997; Redersdorff & Martinot, 2009; Wright & Forsyth, 1997) and discriminatory behaviors (e.g., Cadinu & Reggiori, 2002; Locksley, Ortiz, & Hepburn, 1980; Tarrant, 2002). However, to our knowledge, few studies have examined the impact of intergroup comparison on performance (e.g., James & Greenberg, 1989; van Knippenberg, 2000; Ouwerkerk, Ellemers, & de Gilder, 1999; Pilegge & Holtz, 1997; Turner & Haslam, 2001; Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998), even though it has been recognized that intergroup comparison increases people's motivation to work on behalf of their in-group (James & Greenberg, 1989) and reduces *social loafing*, i.e. the tendency to reduce one's effort in a group when one's own contribution is not identifiable (Huguet, Charbonnier, & Monteil, 1999; Karau & Williams, 1993). For example, Worchel et al. (1998) observed that various conditions enhancing commitment to group work (future interaction, interdependence, and wearing a uniform in the presence of an out-group member) can eliminate group members' tendency to loaf. They demonstrated that when group salience is reinforced by contextual cues such as wearing a uniform or having a group name, intergroup comparison tends to increase manual and cognitive task performance. In a gaming context, Farzan, Dabbish, Kraut, and Postmes (2011) manipulated the online visual representation of teams and individuals in a non-collaborative game such as Tetris[®]. They showed that the mere presence of others, and probably comparison with other teams and/or individuals, increased the number of game play sessions. In other words, persistence in the game was higher when participants were assigned to teams than when they played individually. This effect was obtained irrespective of experimentally induced social conditions: "within" (i.e. gamers tried to score higher than their teammates), "between" (i.e. gamers tried to help their team win), or "within/between" (i.e. gamers tried to score higher than their teammates and to help their team win). Although

¹ Computer-Mediated Communication is defined as any exchange of information (either factual, intellectual, or emotional) occurring through the use of two or more networked computers (McQuail, 2005).

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