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Group Identification is a Mediator of the Effect of Players' Anonymity on Cheating in Online Games

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3 **Group Identification is a Mediator of the Effect of Players' Anonymity on**
4 **Cheating in Online Games**
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7 *¹Vivian Hsueh-Hua Chen, ² Yuehua Wu,*

8
9 *¹Wee Kim Wee School of Communication and Information, Nanyang Technological*
10 *University, Singapore, ²School of Media and Design, Shanghai Jiao Tong University,*
11 *Shanghai, China.*
12

13
14
15
16 *¹Nanyang Technological University, Wee Kim Wee School of Communication and*
17 *Information, 31 Nanyang Link, Singapore 637718. Email: chenh@ntu.edu.sg. Telephone:*
18 *+65-6790-5833. Fax: +65- 6792-4329 (Corresponding author)*
19

20
21 *² Shanghai Jiao Tong University, 1954 Hua Shan Rd. (or 655 Pan Yu Rd.), Shanghai*
22 *Email: yhwu22@sjtu.edu.cn Telephone: +86-10-82865135*
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The Effect of Anonymous Gaming on Game Cheating: The Mediating Role of Group Identification

This study aims to add to the discussion about the applicability of the Classical Deindividuation Theory and Social Identity Model of Deindividuation Effects (SIDE) in explaining online behaviors. It explores the effect of anonymity in facilitating social influence of group identity in online game cheating. A nationally representative survey was conducted face to face. Results from the survey administered in Singapore confirm predictions derived from the SIDE and challenge the Classical Deindividuation Theory. Specifically, it was concluded that the frequency of gaming with online strangers (anonymous gaming) significantly predicted the frequency of cheating in online games. The effect of anonymity on game cheating was found to be significantly mediated by the group identification with online gaming communities/groups. Gender differences were found. Male gamers cheated more frequently than female gamers. Female gamers are more likely to cheat as a consequence of group identification than male gamers. Implications and future research are discussed.

Keywords: game cheating; Social Identity Model of Deindividuation Effects; virtual community.

1. Introduction

As the Internet becomes widely accessible, worldwide computer-mediated communication (CMC) has emerged as a routine means of communication and social interaction. Compared to traditional face-to-face (FtF) communication, CMC is characterized by a number of new features, including reduced social cues and social anonymity (Kiesler, Siegel, & McGuire, 1984). The psychological and social implications of the (relative) anonymity afforded by the Internet have been widely discussed and examined (see Christopherson, 2007, for a review). Specifically, some researchers have sought to use anonymity to account for online problematic behaviors, such as 'flaming' and 'grief gaming' (e.g. Chen, Duh, & Ng, 2009; Moor, 2007; Thompsen, 1996). To add to the relevant literature

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3 in the field, this study purports to examine the effect of anonymity on one relative under-
4 explored problematic behavior -- game cheating (Kücklich, 2008; Kimppa & Bissett, 2005).
5 Game cheating has been prevalent ever since the invention of video games (Consalvo, 2005).
6
7 Cheating in games can ruin the 'fairness' of gaming and affect the interests of other game
8 players (Kimppa & Bissett, 2005; Yan & Randell, 2009) as well as game companies.
9
10 Rampant game cheating often leads to bad game reputation and loss of game players or
11 subscribers in the case of multiplayer online games (Duh & Chen, 2009; Zetterström, 2005).
12
13 Subsequently, it affects game companies' profits. Considering the time and effort invested in
14 both game development and game play, cheating deprives game players and game companies
15 of their labor and can be regarded as a moral offence (Kimppa & Bissett, 2005). The
16 prevalence of cheating in multiplayer computer games (Consalvo, 2007; Webb & Soh, 2007)
17 therefore poses new moral and legal questions for both the gaming and broader Internet
18 community (Kimppa & Bissett, 2005; Parker, 2007; Zetterström, 2005). Hence, game
19 cheating is an important topic for research.
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34 The geographic separation and anonymity afforded by online games, among other
35 unique features of networked computer games, is believed to be one of the reasons for an
36 increase in the possibility and frequency of game cheating behaviors (Parker, 2007). However,
37 this argument lacks solid empirical evidence. Based upon the Social Identity Model of
38 Deindividuation Effects (SIDE) (Reicher, Spears, & Postmes, 1995), the present study looks
39 at how anonymous game playing influences game cheating and examines the underlying
40 mechanism of this effect. Specifically, it takes into account the effect of group identification
41 in the relationship between anonymous gaming and game cheating.
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51 **2. Literature Review, Theoretical Framework and Hypotheses**

52 ***2.1. Game Cheating***

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3 Cheating can be generally understood as breaking rules (Schwieren &
4
5 Weichselbaumer, 2010). However, rule-breaking in games cannot always be easily defined.
6
7 There are no clear-cut rules applicable to all games, game players, and game communities.
8
9 Different people view and define game cheating in distinct ways (Consalvo, 2005). While
10
11 some players find certain game practices acceptable, others may label those same practices as
12
13 cheating. What constitutes cheating in games is often debatable depending on different actors,
14
15 technologies (Botvich et al., 2010) and situations involved. In this study, game cheating is
16
17 defined as strategies that a player uses to gain an unfair advantage over his/her peer players or
18
19 to achieve a target which is not supposed to be achieved according to the game rules or at the
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21 discretion of the game operator (Yan & Randell, 2009).
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25 Despite increasing research attention to game cheating, the empirical investigation of
26
27 cheating is still limited. The extant literature on game cheating primarily focuses on
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29 methods/classification of cheating (e.g. Kimppa & Bissett, 2005; Webb & Soh, 2007; Yan &
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31 Randell, 2009), motivations to cheat (Consalvo, 2007), and ways to combat cheating (Botvich
32
33 et al., 2010; Hu & Zambetta, 2008; Zetterström, 2005). The current literature, however, does
34
35 not fully specify the social psychological mechanisms of the cheating behavior in video
36
37 games. To fill this gap, the purpose of the present study is to explore how the anonymity
38
39 afforded by the online environment and relevant online social activities influence cheating
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41 behaviors in networked computer games. Detailed hypotheses are presented in the following
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43 sections.
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46 47 ***2.2. Anonymity, Deindividuation, and the Social Identity Model of Deindividuation Effects***

48
49 Anonymity is one of the major characteristics of online environments (Johnson, 1997).
50
51 Being anonymous online gives individuals opportunities to behave in socially undesirable or
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53 even harmful ways without being sanctioned (Kiesler et al., 1984; Sproull & Kiesler, 1986),
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3 as in the cases of online flaming (insulting, swearing or using offensive language on the
4
5 Internet) and game cheating.
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8 Deindividuation theory is one of the major theories describing the effects of
9
10 anonymity. Originating from Le Bon's (1895, trans. 1947) concept of 'submergence', the
11
12 theory suggests that immersion and anonymity in groups might evoke a deindividuated state,
13
14 which causes a decrease in self-observation, self-evaluation, and concern for social
15
16 comparison and evaluation, leading to weakened internalized controls and anti-normative
17
18 behaviors (Zimbardo, 1969). The theory of deindividuation has been extended to the domain
19
20 of CMC. It was argued that certain features of CMC, such as anonymity and immersion in the
21
22 medium, produce the classic deindividuating conditions of reduced self-awareness and
23
24 disinhibition (Reicher et al., 1995). Hence, researchers have utilized this theory to account for
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26 deviant online behaviors such as grief gaming (Chen et al., 2009).
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30 With regard to online problematic behavior and the "deindividuation" effects of
31
32 anonymity within the group, an alternative explanation is offered by the Social Identity
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34 Model of Deindividuation Effects (known as SIDE) (Reicher et al., 1995). Building on self-
35
36 categorization theory (Turner, 1987), SIDE argues that the 'deindividuated' state evoked by
37
38 anonymity does not lead to the loss of individuality or self-awareness; rather, it increases the
39
40 salience of social/group identity and hence leads to greater conformity to group norms
41
42 (Postmes, Spears, Sakhel, & Groot, 2001; Reicher et al., 1995). Being anonymous means that
43
44 there is a lack of individuating cues for people to be identified as individuals, which,
45
46 according to self-categorization theory, induces a psychological state of 'depersonalization'
47
48 (Turner, 1987). Once depersonalized, the self-concept shifts from personal identity to social
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50 identity (Reicher et al., 1995; Turner, 1987). Individuals tend to behave according to how
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52 they believe other people from the same (or higher) social category or group will behave
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54 (Chan, 2010).
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3 A meta-analysis of 60 previous studies found that SIDE received a far stronger
4 empirical support and was a better predictor of CMC behavior than classical deindividuation
5 theory (Postmes & Spears, 1998). For example, online flaming was found to be influenced by
6 social norms within a group (Postmes, Spears, & Lea, 2000). Postmes, Spears, Sakhel and
7 Groot's (2001) experimental study also revealed that anonymity increased the influence of
8 group norms in discussions online. In brief, rather than displaying uninhibited and anti-
9 normative behavior, SIDE predicts that people in anonymous CMC tend to conform to
10 perceived group norms. It is within this theoretical framework that the present study attempts
11 to explore the effect of anonymity on game cheating. The primary intention for this study is
12 not to fully test the SIDE itself. Rather, we use this model to help interpret and understand
13 certain aspects of game cheating behavior in Massively Multiplayer Online Games.
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27 ***2.3. Anonymous Gaming, Group Identification, and Game Cheating***

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29 Previous studies based on SIDE demonstrate that individuals tend to act according to
30 perceived group norms and expectations when social group identity is salient and fellow
31 group members are deindividuated in computer-mediated groups (Chan, 2010; Postmes &
32 Spears, 1998; Postmes et al., 2001). Group norms often times are not explicitly stated as
33 online groups are not formed based on a 'predefined social structure' (Postmes et al., 2001).
34 Instead, norms are frequently inferred from the common behaviors or predominant attributes
35 of typical group members (Reicher, 1987). Past literature has shown that game cheating can
36 be considered as a norm among video game players. Consalvo (2007) concluded from her in-
37 depth interviews and a survey of game players and developers that cheating was a daily
38 practice for gamers and most players "engage in the practice on a regular basis" (p. 93),
39 despite the negative connotations associated with the term 'cheating'. Yee (2002) listed
40 "competing unfairly" as one of the motivations for players to engage in multiplayer online
41 games. In a similar vein, Simone et al (2012) argued that a proclivity to cheat is part of
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3 human nature. When given an option, players will typically cheat in a video game. A
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5 common perception of the online (gaming) environment as a space for experimentation on
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7 breaking rules (Consalvo, 2005) as well as the perception that bending rules in video games
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9 has almost no detrimental effect (Kimppa and Bissett, 2005), also promotes cheating
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11 behaviors among gamers.
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14 Game cheating, despite being anti-normative, is already embedded in the normative
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16 culture of play in video games. Many gaming magazines, websites and forums tell players the
17
18 exact ways of how to cheat in video games, for example, offering cheat codes or telling their
19
20 audiences how to exploit certain features (see Kücklich, 2004). Hence, game cheating can be
21
22 considered a predominant attribute of typical gaming community members. In this sense,
23
24 cheating in games can be understood as a normative behavior among gamers who belong to
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26 the same gaming community. It is important to clarify the use of the term 'normative' in
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28 describing game cheating. As mentioned in the previous section, game cheating is considered
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30 anti-normative and problematic in a general sense. The fact that game cheating is perceived
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32 to be a normative behavior within a gaming community does not justify or change the fact
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34 that game cheating is still considered as an anti-normative behavior in general. In this sense,
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36 game cheating is an anti-normative behavior that is being recognized as normal and common
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38 within given gaming communities.
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43 As noted previously, SIDE predicts that anonymity reinforces the influence of group
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45 norms in online communities. As a result anonymous gaming could increase the likelihood of
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47 game cheating behavior, perceived as a group norm, influencing gamers' in-game behavior.
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49 In other words, when people play games under anonymous conditions, they are more likely to
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51 follow what they believe other players are doing, and performing cheats can be one of them.
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53 Therefore, we propose the following hypothesis.
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3 **H1:** The more often a person plays games anonymously, the more often he/she cheats
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5 in games.
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8 Salience of social identity (often measured by group identification) is another major
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10 concept in SIDE and SIDE-based research (Lee, 2006; Postmes et al., 2001; Reicher, 1984).
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12 According to self-categorization theory (Turner, 1987), social influence is cognitively
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14 mediated by one's self-categorization as a group member. Empirical studies also
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16 demonstrated that heightened in-group identity produces greater adherence to group norms
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18 (e.g. Mackie, 1986). Ren and colleagues (2012) conducted a field experiment on a movie-
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20 related online community, where they found that increased group identification led to more
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22 frequent site visits and fostered stronger identity attachment as compared to other conditions.
23
24 Building upon self-categorization theory, SIDE argues, with empirical support, that
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26 anonymity in the group can enhance identification with the group and thereby increase
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28 conformity to group norms. In other words, group identification mediates the effect of
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30 anonymity on individual behaviors (Lee, 2006; Postmes et al., 2001). In the context of
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32 playing games within a group, cheating can be considered as a kind of normative behavior or
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34 a group feature. Hence, one can argue that anonymous gaming can foster or enhance a
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36 player's social in-group identification in an online gaming community/group. The salience of
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38 gaming group identity is a mediator of the effect of anonymous gaming on game cheating.
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40 Specifically, we will test the following hypotheses.
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47 **H2:** The more often a person plays games anonymously, the more salient the group
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49 identification he/she demonstrates in a game community.
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54 **H3:** Gaming group identification is a mediator of the relationship between anonymous game
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56 playing and game cheating.
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3. Method

Studies based on SIDE and deindividuation theory have been primarily conducted in laboratory conditions involving “zero-history groups discussing hypothetical scenarios with no real-life consequences”, where “experimental control came at the cost of limited ecological validity” (Lee, 2006, p. 443). Considering the possible shortcomings of experimental research, SIDE researchers emphasize the need to apply the theory and assess its use in more realistic contexts, that is to study anonymous conditions that occur in naturalistic settings on the Internet instead of conditions created in a lab (Postmes, Spears, & Lea, 1998). Although the self-reporting survey approach is also criticized for its limitations in validity due to potential response bias, some studies have found a relatively high rate of self-reported deviant behaviors such as drug use. (Zanis, McLellan, Randall, 1994). Given the right questionnaire design and context that assures anonymity and/or confidentiality, survey respondents can give honest reports about criminal or various deviant behaviors (see Farrington, 1973; Harrison, 1994). Thus, we could reasonably argue that a survey design allows a closer access to real-world attitudes and behaviors than experimental design (Northrup, 1996). This improvement in ecological validity is an advantage over studies based on experiments. Hence, this study employed a survey to examine the influence of anonymity and salience of group identification in gaming on game cheating behaviors.

3.1. Sampling

The data for this study were collected as part of a larger survey study of online game behaviors of adolescents in Singapore. Data collection took place over a period of three weeks in May and June of 2009. Based on the data provided by the Singapore Department of Statistics most recent census in 2008, stratified sampling was employed to recruit respondents according to the population distribution in Singapore. The number of samples collected from each Mass Rapid Transit station and neighborhood center was representative of the

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3 population ratio of the nearby living area to the entire population. A total of 1400 paper-
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5 pencil surveys were randomly distributed at all neighborhood centers and the nearest Mass
6
7 Rapid Transit railway stations in Singapore. A set of screening questions was used to identify
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9 qualified respondents. Respondents had to be 18 years of age or below, a Singaporean citizen
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11 or permanent resident, had to live within the target residential area, and play video games. A
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13 total of 961 valid responses (69% response rate) were collected for data analysis. Participants
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15 received no incentives.
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18 **3.2. Measures**

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20 Aside from demographic information, the survey included measures for the three most
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22 played games, frequency of gaming, anonymity, gaming group identification and game
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24 cheating. Most of the variables involved in this study were measured with items using a 7-
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26 point Likert scale. All the 7-point scale items used the same endpoints (1= never, 7= very
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28 frequently).
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32 To measure the dependent variable of game cheating, respondents were asked to self-
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34 report on the frequency they used cheats or hacked a game, and “used mods or other player-
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36 generated code that changed something in the game”. Mean scores of these two items were
37
38 obtained to represent respondents’ game cheating frequency (Cronbach’s $\alpha = .63$).
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40

41
42 Zimbardo (1969) defined anonymity as the inability of others to identify or single out
43
44 an individual such that the individual cannot be evaluated, criticized, judged or punished. A
45
46 common feature of online communication is the relative anonymity of contact with others,
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48 especially during initial interactions. The lack of visual and social cues in the online
49
50 environment provides opportunities of pretense and deceit even with real-life friends, which
51
52 arguably maintains a certain level of anonymity. However, people may also knowingly play
53
54 games with real-life friends over the Internet. Taking both conditions into consideration, the
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56 extent of anonymity during game play is measured by the frequency of playing games with
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3 strangers online. The more frequently a gamer plays games with complete strangers, the more
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5 frequently they are anonymous in game. Specifically, respondents were asked to rate the
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7 frequency with which they played with people they only met inside the online games. Even if
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9 gamers later develop close relationships with strangers whom they first met in games online,
10
11 the lack of identifiable cues may still persist. Following Tanis and Postmes (2008),
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13 ‘anonymity’ in this study has a limited meaning, pertaining to gamers who play online games
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15 anonymously with others not in their interpersonal real life social networks, but who belong
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17 to the same overarching gaming community.
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20
21 Gaming group identification is measured by respondents’ involvement in gaming
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23 communities or groups. Group identification here can be equated with group salience,
24
25 common in SIDE literature¹. Specifically, a four-item scale was used to gauge the salience of
26
27 group identification. Respondents were asked to report the frequency of (1) playing games as
28
29 a part of a guild or other online group within the game, (2) reading or visiting websites,
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31 reviews or discussion boards related to the games they play, (3) writing or contributing to
32
33 websites, reviews or discussion boards related to the games they play, and (4) organizing or
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35 managing game groups or guilds. (Cronbach’s $\alpha = .79$).
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39 **4. Data Analysis and Results**

40 **4.1. Descriptive Statistics**

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44 During data screening, unreasonable input, such as people reporting gaming for 24
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46 hours a day and 7 days a week, and people reporting gaming for more than 7 days a week, 24
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48 hours a day and missing data were excluded. A total number of 941 cases were kept for final
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50 analyses.
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57 ¹ The overlap and distinction of the two terms is beyond the scope of this paper. Please refer to Turner
58 (1999) and Leach et al (2008) for detailed discussion on this issue.
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3 Descriptive statistics showed that the participants in this study aged from 13 to 18,
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5 with the mean age of 16 and the 16-18 age range being the largest group (65%). The sample
6
7 had more males (57%) than females (43%). In terms of ethnic background, respondents were
8
9 primarily Chinese (81%), with Malays (11%) and Indians (5%) constituting the next two
10
11 major ethnic groups. This generally reflects the population makeup in Singapore. The highest
12
13 level of education attained was secondary school (55%), junior college (23%), polytechnic
14
15 (17%), institute of technical education (4%), and university (2%). The average gaming time
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17 was 14.15 hours ($SD = 14.2$) per week. All participants in this study played games.
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19

20
21 In terms of cheating in games, 30% of the participants reported never cheating in
22
23 games, the majority (70%) of gamers cheated at least occasionally. The mean score on game
24
25 cheating was 2.80 ($SD = 1.80$). 17% of the participants fell into the category of frequent
26
27 cheaters (score of 5 or above). Consistent with the existing literature (Consalvo, 2007; Webb
28
29 & Soh, 2007), these results indicate that game cheating is a common behavior among young
30
31 gamers in this study. Moreover, the researchers conducted six focus group sessions to study
32
33 game cheating with late adolescents nine months after data collection for this survey study
34
35 had been done. Participants in the focus group were experienced gamers who were familiar
36
37 with game cheating. Their age ranged from the age of 17 to 29 ($M = 23$) and their gaming
38
39 experiences were between 1 to 20 years ($M = 10.5$). Out of 29 participants, 18 indicated that
40
41 their friends and they themselves cheated very frequently, 2 said they did it sometimes, 5 said
42
43 they did it infrequently, and 3 said they had never cheated. The focus group result also
44
45 showed that all participants viewed game cheating as something “everyone is doing” and “If
46
47 you don’t do it, you will lose out”. This further validated our assumption that game cheating
48
49 is a group norm in the gaming community.
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54 The mean anonymity score was 3.43 ($SD = 2.10$) out of 7. Twenty-nine percent of the
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56 participants reported that they never played games with people whom they had met online for
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the first time (complete strangers), whereas 33% played with complete strangers quite frequently (scoring 5 or above on the 1-7 frequency scale). The mean gaming group identification score was 3.20 ($SD = 1.50$) out of 7.

An additional factor of interest for this study was gender. Most studies found significant gender differences (e.g. Bianco & Schmelz, 2007; Jensen, Arnett, Feldman, & Cauffman, 2002) in the incidence of cheating and unethical behaviors in general. In this study gender was first controlled when regression analyses were conducted to test the hypotheses. Subsequently, moderated mediation analysis was conducted to establish whether gender acts as a significant moderator effect.

4.2. Regression Analyses and Results

Regression analyses were performed to test the hypotheses. H1 and H2 were tested first as they are the prerequisites of H3. In a series of regression analyses, a path analysis – displayed in Figure 1 – was conducted to establish the mediating role of group identification in the relation between the predictor variable (anonymous gaming) and the outcome variable (game cheating) (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004). Correlations between the variables in the regression analysis are reported in Table 1.

Table 1. Correlation table for variables in regression analysis.

| Variables | Gender | Anonymous Gaming | Gaming Group identification | Game Cheating |
|-----------------------------|--------|------------------|-----------------------------|---------------|
| Anonymous Gaming | -.24** | | | |
| Gaming Group Identification | -.26** | 0.42** | | |
| Game Cheating | -.20** | 0.23** | 0.40** | |
| **p < 0.01 | | | | |

1
2
3 The first regression analysis had to establish whether there was a significant relationship
4 between anonymous gaming and game cheating (H1) (see Path c in *Figure 1*). Several
5 researchers (Rucker et al., 2011; Zhao et al., 2010 and references therein) question the
6 necessity of this step as significant mediation effects can be found even when the regression
7 coefficient of Path c is non-significant². Nevertheless, the authors find it useful to report all
8 of the significant regression coefficients in the analysis. The second regression analysis was
9 needed to establish whether there was a significant relationship between anonymous gaming
10 and gaming group identification (the mediator) (H2) (see Path a in *Figure 1*). In the third
11 multiple regression analysis, the outcome variable was regressed on both the predictor (Path
12 c') and the mediator. To validate the mediation model, the mediator of group identification
13 must be significantly related to the outcome variable of game cheating (see Path b in *Figure 1*)
14 after controlling for the effect of anonymous gaming on game cheating. According to Frazier
15 et al. (2004), a complete mediation would be established if the effect of anonymous gaming
16 on game cheating (c') did not differ from zero after controlling for the effect of group
17 identification. If group identification was a partial mediator, the relation between anonymous
18 gaming and game cheating (c') would be significantly smaller (but still be greater than zero)
19 when group identification was included than when the outcome was only regressed on
20 anonymous gaming (c). Rucker et al. (2011), however, caution that full mediation can be
21 established only when all possible mediators and suppressor variables are identified and
22 included in the model. Therefore, no claims of full mediation are made here. [A bootstrap
23 interval \(Preacher & Hayes, 2004\) was calculated to test the significance of the mediated
24 effect.](#)
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In addition, bootstrap confidence interval (Preacher & Hayes, 2004) was calculated to test the significance of the mediated effect.

Figure 1. Diagram of paths in the mediation model of game cheating (H3).

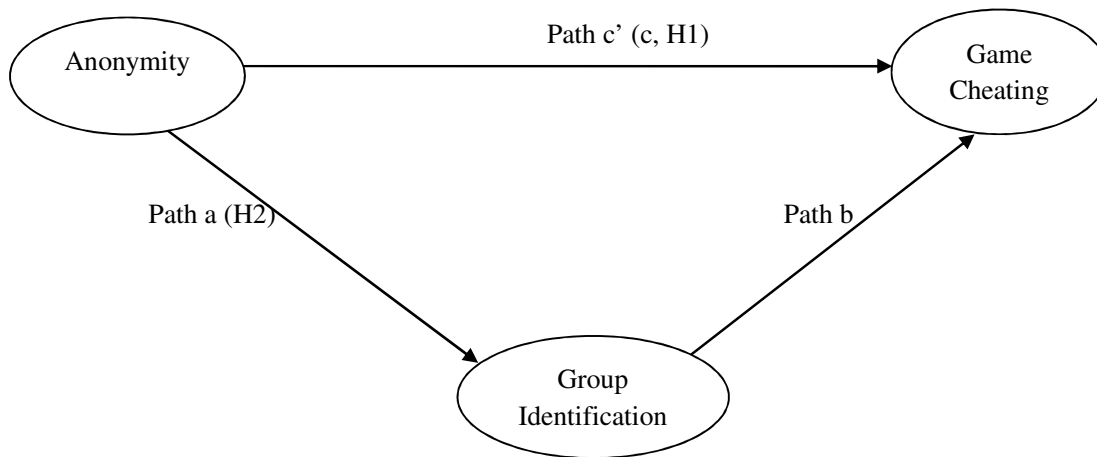


Table 2 shows the results of testing the three hypotheses delineated above. Gender as a control variable was found to be significant in all the three regression analyses, suggesting a significant gender effect on gamers' cheating behavior.

Table 2. Testing mediation model of game cheating using multiple regression.

| Testing steps in mediation model | <i>b</i> | <i>SE b</i> | β | <i>F</i> | <i>df_{regression}</i> | <i>df_{residual}</i> | Adjusted <i>R</i> ² |
|----------------------------------|----------|-------------|---------|----------|--------------------------------|------------------------------|--------------------------------|
| Step 1 (Path c) | | | | 36.11** | 2 | 924 | 0.07 |
| Outcome: game cheating | | | | | | | |
| Predictor: anonymous gaming | .16 | .03 | .19** | | | | |
| Control: gender | -.55 | .12 | -.15** | | | | |
| Step 2 (Path a) | | | | 129.79** | 2 | 924 | 0.22 |
| Outcome: group identification | | | | | | | |
| Predictor: anonymous gaming | .29 | .02 | .40** | | | | |
| Control: gender | -.48 | .09 | -.16** | | | | |
| Step 3 (Path b and c') | | | | 69.63** | 3 | 923 | 0.18 |
| Outcome: game cheating | | | | | | | |
| Mediator: group identification | .46 | .04 | .38** | | | | |
| Predictor: anonymous gaming | .03 | .03 | .04 | | | | |
| Control: gender | -.34 | .11 | -.09** | | | | |

***p* < 0.01

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4 Specifically, male gamers cheated significantly more often than female gamers, and had a
5
6 higher score for group identification. Meanwhile, statistical results fully supported the three
7
8 hypotheses and the mediation model. First, anonymous gaming was found to be a
9
10 significantly positive predictor of online game cheating behavior (controlling for gender) (β
11
12 = .19, $t = 5.79$, $p < .01$), indicating that the more often a person played games with people
13
14 he/she met online for the first time (online strangers), the more often he/she cheated in games.
15
16 Hence, H1 was supported. In Step 2, gaming group identification (the hypothesized mediator)
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18 was regressed on anonymous gaming, which again revealed a significant regression
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20 coefficient ($\beta = .40$, $t = 13.51$, $p < .01$), suggesting that the frequency of anonymous gaming
21
22 was positively associated with gamers' group identification (controlling for gender), which
23
24 provides support for H2.
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31 In Step 3, game cheating frequency was regressed on both anonymous gaming and
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33 gaming group identification. Gaming group identification was found to be a significant
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35 predictor of game cheating ($\beta = .38$, $t = 11.26$, $p < .01$) after controlling for anonymous
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37 gaming and gender (Path b), whereas the effect of anonymous gaming was not significant (β
38
39 = .04, $t = 1.07$, $p = .29$, *ns*) (controlling for group identification and gender), which means
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41 Path c' did not differ from zero. Bootstrap 95% CI for the indirect effect of anonymous
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43 gaming on the frequency of cheating was [0.10, 0.17] indicating a significant mediation effect
44
45 of gaming group identification. This result shows that gaming group identification mediated
46
47 the relationship between anonymous gaming and online game cheating was supported.
48
49 Therefore, H3 is supported. The percentage of variance explained by the path model ($100 \times$
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51 R^2) with only anonymous gaming as a predictor of game cheating (7%) significantly
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53 increased when gaming group identification was added as a predictor (18%).
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As the effect of gender was quite pronounced in the model, we decided to run a moderated mediation regression analysis using the PROCESS for SPSS macros (Hayes, 2013). The result of this analysis is summarized in Table 3.

Table 3. Moderated mediation model of game cheating.

| Testing steps in mediation model | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>F</i> | <i>df_{regression}</i> | <i>df_{residual}</i> | <i>Adjusted R²</i> |
|----------------------------------|----------|-------------|----------|----------|--------------------------------|------------------------------|-------------------------------|
| Path a | | | | 86.87 | 3 | 923 | 0.22 |
| Outcome: group identification | | | | | | | |
| Predictors: | | | | | | | |
| anonymous gaming | 0.27 | 0.03 | 9.78** | | | | |
| gender | -0.62 | 0.17 | -3.71** | | | | |
| anonymous gaming X gender | 0.04 | 0.04 | 1.01 | | | | |
| Paths b and c' | | | | 42.63 | 5 | 921 | 0.19 |
| Outcome: game cheating | | | | | | | |
| Mediators: | | | | | | | |
| group identification | 0.39 | 0.05 | 7.61** | | | | |
| group identification X gender | 0.16 | 0.08 | 1.95 | | | | |
| Predictors: | | | | | | | |
| anonymous gaming | 0.04 | 0.04 | 1.15 | | | | |
| gender | -0.72 | 0.27 | -2.64** | | | | |
| anonymous gaming X gender | -0.03 | 0.06 | -0.59 | | | | |

** $p < 0.01$

It can be concluded that gender does not significantly moderate relationships between the variables in the model in question. Only one interaction, group identification X gender, approaches marginal significance ($p = 0.052$). This means that females are more likely to cheat as a consequence of group identification. Otherwise, gender affects the means of the variables in the model (females are less likely to identify with a group, game with strangers, and cheat), but not the paths between them.

5. Discussion and Conclusion

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3 The current study explored the effect of anonymity and group identification on game
4 cheating behaviors. The result fully supported the three hypotheses. Specifically, it was found
5 that gaming with strangers online (anonymous gaming) significantly increased cheating
6 practices in games (H1). Group identification was found to be stronger among gamers who
7 played games more frequently with people they met online for the first time (H2). The effect
8 of anonymity on game cheating, however, was found to be mediated by group identification
9 within gaming communities (H3).
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18 The results hence are consistent with the assumption of the current study that SIDE
19 accounts better for incidence of cheating in online games than the Classical Deindividuation
20 Theory. It is also in congruence with previous findings by SIDE researchers (Postmes et al.,
21 2001). That is, people in an anonymous gaming situation tend to conform to perceived group
22 norms and follow normative behaviors (cheating in this study) due to the mediation of online
23 gaming group identification. The reduction of individual visibility as a result of anonymous
24 gaming accentuates the process of depersonalization, and further amplifies the perception that
25 the individual belongs to a particular social group. Individuals will tend to judge themselves
26 based on stereotypical group features and behave accordingly (Postmes, Spears, & Lea, 1998).
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38 Furthermore, the findings also support another assumption of the current study that
39 game cheating is a normative behavior/culture within the online gaming community.
40 Although previous studies on gaming argued strongly for this assumption, this study provides
41 the necessary empirical evidence. The findings also provide further explanations as to why
42 and how gamers cheat in online games, contributing to the current game cheating literature.
43 In the context of online games, maintaining anonymity is common for players. When players
44 immerse themselves in the gaming community/culture anonymously and identify with the
45 gaming community, they tend to cheat more frequently in games. Therefore, over time, game
46 cheating becomes a common practice within the online gaming community, affecting even
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3 newly joined game players/community members. This is not solely due to anonymity but also
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5 the influence of the online gaming community culture as discussed earlier. This explains how
6
7 and why players may cheat in video games, and how anonymity can affect cheating behaviors
8
9 from both SIDE and deindividuation perspectives.
10

11 The gender differences found in this study fit with previous research findings.
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13 Females tend to cheat less than males, in games and in real life. Jensen et al. (2004) found
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15 that male students were more accepting towards lying to their parents and also lied more to
16
17 their parents than did female students. In Calbrese and Cochran's (1990) study of academic
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19 cheating in American high schools, it was discovered that girls were less likely to cheat than
20
21 boys. However, they had a stronger tendency to cheat, as compared to boys, if they were
22
23 helping others to succeed whereas males were more likely to cheat for personal success. One
24
25 plausible explanation for this finding derived from previous research (Evans, Craig & Mietzel,
26
27 1993) is that females, as compared to males, tend to be more concerned about their
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29 interpersonal relationships. Hence, females worry more about the social sanction for a
30
31 problematic behavior than do males. If the behavior in question has social merit (e.g. better
32
33 relationship quality), females will be more likely than males to engage in it. This explanation
34
35 also strengthens the argument put forth by SIDE scholars. With the emphasis on social
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37 relationships, females are more likely to be involved in their communities and establish a
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39 shared social identity than males. Consequently, females are more likely than males to follow
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41 a stereotypical group behavior.
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47 Postmes and Spears's (2002) study, also based on SIDE, provides a slightly different
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49 but related perspective. They argued that anonymity offered by the online environment was
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51 associated with greater gender differences than in real life because online group members
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53 cannot individuate each other. When group members are unable to identify each other, self-
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55 stereotyping occurs. That is, individuals behave according to not only group stereotypes but
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3 also gender stereotypes. Hence, females may exhibit commonly recognized female behavioral
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5 traits, such as emphasis on relationships with group members and adherence to group norms.
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8 Besides being in agreement with current research on gaming, this study is innovative
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10 in several ways. First, the findings provide new insights into and the underlying mechanisms
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12 of game cheating. It established a relationship between a form of socially undesirable online
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14 behavior (game cheating) and participants' identification with online gaming groups. This is
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16 the first study that establishes such a relationship. It not only extends the application of SIDE
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18 to a new domain- online gaming, but also contributes to gaming literature by providing an
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20 explanation for game cheating behaviors online from a SIDE perspective. Second, most of
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22 SIDE research has been focused on experimental studies in lab settings. Only a handful of
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24 studies on SIDE, as mentioned in previous sections, were conducted in field settings and even
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26 those were experimental. The current study utilizes self-report survey in the field setting
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28 (online gaming groups) and provides evidence that SIDE claims can still be verified. Third,
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30 for researchers who are interested in studying deviant or anti-social behaviors, the current
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32 study demonstrates that online video gaming is a good testing ground for their theories. The
33
34 online gaming community is easily accessible and highly dynamic. In such a research context,
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36 participants can be observed continuously without intrusion. Gamers are typically willing to
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38 report and explain their (deviant) behaviors in video games they play, especially if the
39
40 researcher(s) are part of the gaming community. To conclude, this study shows that SIDE is
41
42 applicable for explaining game cheating behavior online. It shows that deviant behaviors
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44 online such as game cheating are largely influenced by the online social groups people feel
45
46 they belong to. An online group, despite its fluid, unstable and imaginary nature, is powerful
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48 in constructing and changing its members' attitudes and views on behaviors. Hence, a
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50 behavior that is perceived as problematic and deviant can be reconstructed with a different
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52 interpretation.
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6. Limitations and future research

One caveat is that despite the increased ecological validity offered by this study's survey of real online gaming experiences, the method of recalled self-report has its limitations. The prevalence of game cheating has been reported in the literature (Consalvo, 2005, 2007) and can be considered as a normative behavior within the gaming community. However, no existing study, including this one, can offer definitive conclusions as to whether game cheating is regarded as a positive or negative behavior within gaming communities. In a self-report survey, it is possible that game cheating can be regarded as an inappropriate behavior leading to underreporting or denial among participants. Conversely, over-reporting is also likely, if game cheating is held in high regard in the gaming circles of the participants. It is also possible that in different kinds of game and associated gaming communities, certain kinds of cheating behaviors can be regarded as positive and others as negative. Future research should take this into consideration in the questionnaire design.

Since the theoretical basis for the current study is SIDE, psychological and individual factors that might influence cheating behaviors, such as personality traits and moral values, were not included. Future studies may investigate individual characteristics or moral-value-related variables. In addition, it is possible that the salience of group identification mediates the effect of anonymity because it is correlated with other variables that are the 'true' mediators, which has also been noted by SIDE researchers (Postmes et al., 2001). Furthermore, in the context of this study, game-related variables are highly relevant. Some research has indicated that context and skill can influence a person's cheating behavior (Schwieren & Weichselbaumer, 2010). Hence, game-related factors such as game types, gaming history, gaming skills, gaming context should be considered in future studies. By

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2
3 including factors identified above, future studies may be able to explain more variance in
4
5 game cheating than the current study (18%).
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8 As part of a larger study of online gaming behavior of adolescents in Singapore, this
9
10 study only used an adolescent sample. Although video games are often regarded as an
11
12 activity for adolescents or children, computer gaming has become a popular recreational
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14 activity for people of all ages worldwide. Griffiths, Davies and Chappell (2004) found that
15
16 there are significant differences in gaming habits and preferences between adolescent and
17
18 adult gamers. Therefore, adult game cheating behaviors might differ from those of
19
20 adolescents. Hence, to gain an unbiased and complete picture of game cheating behaviors,
21
22 adult gamers should also be studied in the future.
23

24
25 Lastly, the correlational nature of the mediation analyses makes the inferences less
26
27 strong than when the process is manipulated directly in experimental research. Consequently,
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29 an online gaming experiment can be an effective method for follow-up studies.
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