



# A measure of social behavior in team-based, multiplayer online games: The Sociality in Multiplayer Online Games (SMOG) scale



Chelsea M. Hughes<sup>\*</sup>, Brandon J. Griffin, Everett L. Worthington Jr.

<sup>a</sup> Virginia Commonwealth University, 800 W. Franklin St., Richmond, VA 23284-2018, USA

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## ABSTRACT

Video games have become a platform for social interaction. Across three studies, we develop a scale to measure social behavior in team-based, multiplayer online games – the Sociality in Multiplayer Online Games (SMOG) Scale – and provide evidence for its initial construct validity. We reviewed all measures relating to video games ( $N = 253$  measures) to determine whether there was a need for such a scale. As a pilot study, we conducted two focus groups ( $N = 16$ ) to inform item generation. In Study 1 ( $N = 250$ ), we ran an exploratory factor analysis on the items. The SMOG scale was made of two orthogonal factors, assessing anti-social behavior (destructive, SMOG-D) and pro-social (constructive, SMOG-C) behavior. In Study 2 ( $N = 104$ ), we conducted a confirmatory factor analysis and provided evidence supporting initial construct validity of the SMOG: when statistically controlling for age, sex, and frequency of game-play, dominance positively predicts both SMOG-D and SMOG-C scores; and affiliation negatively predicts SMOG-D and positively predicts SMOG-C.

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## 1. Introduction

A growing field of research has examined the relationships between social behavior, video game play, and personality. The vast majority of studies to-date has focused on the effects of video game play on real-world social behavior (for a review, see Greitemeyer & Mügge, 2014). In these cases, the real-world social behaviors have been the primary variable of interest; the social behavior occurring in-game has been considered to a much lesser extent. Yet according to the Entertainment Software Association (in their annual non-refereed gaming research study, conducted by a third-party contractor), 42% of Americans play video games for at least 3 h per week; 54% of the most frequent gamers play with others; and those frequent gamers average over 11 h per week playing with other people (ESA, 2015; 2016). People are spending a significant amount of time interacting with others through video games.

These game-based interactions are not just pervasive, but also make an impact on the players. Research shows that in-game behaviors elicit real-world psychological responses. In a sample of undergraduates ( $N = 185$ ), Grizzard, Tamborini, Lewis, Wang, and Prabhu (2014) studied the relationship between virtual-world

immoral behavior and its real-world effects. Participants were placed on one of two teams: either a guilt-inducing condition (playing the game as a terrorist) or a control condition (playing the game as a UN soldier). Those who played as terrorists reported experiencing greater guilt after the fact and increases in the salience of violated moral values. Grizzard et al. consequently suggested that behaviors people commit against others in the virtual world can elicit emotional responses much like real-world behavior does. These responses are not only emotional, but also behavioral. Play of relaxing or cooperative video games has been associated with subsequent increases in prosocial and decreases in anti-social behaviors (Dolgov, Graves, Nearents, Schwark, & Volkman, 2014; Whitaker & Bushman, 2012).

Specifically regarding in-game social communication, the online gaming environment is notorious for destructive social behavior amongst its players, such as verbal aggression and sexual harassment (Fox & Tang, 2014; Tang & Fox, 2016). These experiences result in real emotional distress (Fox & Tang, 2015). Conversely, gamers often develop and maintain intimate friendships with their teammates through their game-based interactions (e.g., Pace, Bardzell, & Bardzell, 2010). While online social connection and real-world social connection are distinct constructs, both predict similar positive psychological outcomes, like lower depression and greater life satisfaction (Grieve, Indian, Witteveen, Tolan, & Marrington, 2013). Some people actually prefer virtual social

<sup>\*</sup> Corresponding author. 806 W. Franklin St., Richmond, VA 23284-2018, USA.  
E-mail address: [hughescm6@vcu.edu](mailto:hughescm6@vcu.edu) (C.M. Hughes).

interaction to real-world social interaction (Ng & Weimer-Hastings, 2005). As such, the social behavior occurring in-game should be a targeted variable of interest in psychological science.

Some studies have begun to examine in-game social behavior; however, they have been limited by the specificity of gameplay. For example, researchers have used automated behavioral reports from video games to determine associations between personality traits and the content of messages sent to other players (Yee, Ducheneaut, Nelson, & Likarish, 2011). Other studies have looked at specific forms of social behavior, like in-game evidence of sexual harassment towards other players (Fox & Tang, 2014). These studies examine specific phenomena of social behavior in gaming. Yet traditionally, scholars have theorized that active social behavior falls into two categories: anti-social behavior, which is interpersonally destructive; and pro-social behavior, which is interpersonally constructive (Clarke, 2003). The purposes of the present study were two-fold; first, to develop a psychometrically validated, generalizable scale that measures in-game social behavior; and second, to examine the influence of personality on in-game social behavior. Specifically, the present study details the development of a scale that measures anti-social and pro-social behavior in team-based, multiplayer online games, as well as investigates the predictive value of personality traits on those anti-social and pro-social behaviors.

Kiesler (1983) suggested that most behavior can be characterized according to its interpersonal functions along two dimensions: dominance (i.e., surgency/extraversion) and affiliation (i.e., agreeableness/nurturance). Dominance is a personality trait characterized by assertiveness, forcefulness, firmness, and persistence (Trapnell & Wiggins, 1990). Affiliation is a personality trait characterized by kindness, tenderness, and charitableness (Trapnell & Wiggins, 1990). Research has demonstrated that these characteristics are predictive of both pro-social and anti-social behavior. Regarding dominance, the literature wholly suggests positive relationships between dominance and both pro-social and anti-social behaviors (as opposed to socially neutral behaviors). Several studies have evidenced a moderate ( $r = 0.34$ ) correlation between dominance and helpfulness (Freifeld, 1993; Poindexter, 1994). Among college students, dominance is correlated positively with volunteerism ( $r = 0.14$ ) and prosocial values ( $r = 0.18$ ; Carlo, Okun, Knight, & de Guzman, 2005). Yet trait dominance also is associated positively with anti-social behaviors such as ridicule, verbal aggression, and pranking ( $r = 0.26$ – $0.28$ ; Lee, Ashton, & Shin, 2005; Parkins, Fishbein, & Ritchey, 2006).

The study of anti-social and pro-social behavior is particularly applicable in relation to bully behaviors, wherein bullying is conceptualized as an anti-social behavior, and bully intervention is conceptualized as a pro-social behavior. In a study of 1129 Dutch children, using both self- and other-report measures, Olthof, Goossens, Vermande, Aleva, and van der Meulen (2011) found that trait dominance positively predicted both bullying and bully-intervening behavior. Conclusively, it is the dominant individuals who are enacting destructive and constructive social behaviors in the community.

Regarding affiliation, research has consistently demonstrated a positive relationship with pro-social behaviors, and a negative relationship with anti-social behaviors. Graziano and Eisenberg (1997, pp. 795–825) posit that affiliation might be the core trait contributing to pro-social behavior. By their nature, affiliative individuals are soft-hearted, compliant, altruistic, and favor interpersonal harmony and cooperation (Anderson, John, Keltner, & Krings, 2001; Graziano, 1994; Graziano & Tobin, 2009, pp. 46–61; McCrae & Costa, 1997). Affiliation is associated positively with volunteerism, prosocial values, prosocial motivation, empathy, and bully-intervention (Carlo, Okun, Knight, & de Guzman, 2005;

Graziano, Habashi, Sheesem, & Tobin, 2007; Tani, Greenman, Schneider, & Fregoso, 2003). Conversely, the literature shows that affiliation is negatively associated with anti-social behavior. In a meta-analysis of 15 studies (total  $N = 4673$ ), Miller and Lynam (2001) examined how affiliation predicts a variety of anti-social behaviors, ranging from childhood delinquent behaviors to diagnostic criteria for Antisocial Personality Disorder. The research found an unweighted mean effect size of  $-0.37$ ,  $p < 0.001$ , suggesting that affiliation is negatively associated with anti-social behavior. This negative relationship, though weaker ( $r = -0.12$ ) has also been demonstrated among less severe anti-social behaviors, like classroom and workplace bullying (Lee et al., 2005; Tani et al., 2003). Although these relationships have been shown to exist in real-world behavior, whether they also exist in gaming has not been investigated. Gaming directly impacts the lives of players through their in-game interactions, and personality plays a substantial role in those interactions. Thus, it is crucial to investigate this, especially for young adults who might spend substantial time playing online multiplayer interactive games.

In the current studies, we develop a psychometric scale to assess the frequency of destructive (anti-social) and constructive (pro-social) behaviors in gaming. First, we conducted a pilot study. We established the need for such a scale through a literature review ( $N = 253$  articles that measured aspects of game playing in online games). Then we generated items using two focus groups of gamers in an undergraduate population ( $N = 16$ ).

In Study 1 ( $N = 250$ ), we conducted an exploratory factor analysis using the items generated from the pilot study on a mixed sample of undergraduate students and a general adult population to uncover the structure of responses to the items. In Study 2 ( $N = 104$ ), we replicated the factor structure using confirmatory factor analysis, and we further winnowed the scale to create the Sociality in Multiplayer Online Games (SMOG) scale. We also provided initial evidence for the construct validity of the SMOG, using Kiesler's (1983) interpersonal circle, characterized by dominance and affiliation.

## 2. Pilot study

The pilot study consists of two parts: first, we conducted a full literature review on the questionnaires, inventories, measures, and scales that examine behavior, attitudes, and content related to gaming; second, we conducted two focus groups to inform item generation for the scale assessing social behavior in video games. Given the lack of research in the area of in-game social behavior and the intent of assessing a broad range of social behaviors, we determined that unstructured focus groups of gamers would best inform the generation of the items (as suggested by Nassar-McMillan & Borders, 2002).

### 2.1. Method

#### 2.1.1. Measure review

On 17 October 2015, we ran the term “games” through the *PsycTESTS* database using the overall search function. We chose this broad term based on the inconsistent terminology around video gaming (e.g., “videogames,” “video games,” “online gaming,” or other variants) Thus, any test with the word “games” in its title, construct, or abstract was retrieved.

#### 2.1.2. Focus groups

Participants of the focus groups ( $N = 16$ ) were undergraduates recruited from a video gaming club at a university through posted flyers. They were randomly assigned into two focus groups ( $n = 8$ ,  $n = 8$ ). Of the participants,  $n = 11$  (68.8%) identified as male, and

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