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Beyond Traditional Interaction: Exploring the functional form of the exposure-offending association across online network size

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ABSTRACT

Purpose: An emerging body of literature suggests online social networks (SNS) have the capacity to influence individual criminal behavior. However, there are fundamental differences between SNS and traditional peer groups. It is therefore likely that peer influence operates differently in SNS. The present study examines the role of network size and functional form of the relationship between individual and peer deviance in online networks.

Methods: Data for these analyses come from a survey of 583 undergraduates at a mid-southern university. Empirical analyses rely on a series of multivariate negative binomial regression models.

Results: Findings indicate there is a nonlinear relationship between exposure to criminal behavior online and self-reported offending. Network size moderates this relationship. Respondents embedded in the smallest networks exhibit a linear association between peer and individual behavior, while those in the largest networks display a saturation point, after which exposure to additional deviance becomes redundant.

Conclusions: The current study expands upon the emerging body of criminological research exploring the implications of online environments as venues for social learning. We showcase how processes of peer influence operate in online social networks and potentially affect criminal behavior.

Introduction

The association between individual and peer behavior is one of the most consistently observed phenomenon in the criminological literature (Pratt et al., 2010). While much of this research assumes that peer influence operates through traditional, face-to-face contact, technological advancements have revolutionized socialization. As a result, the very nature of social interaction has been fundamentally altered. Similar to traditional studies of peer influence, an emerging body of literature suggests online or virtual communication also has the capacity to influence behavior (McCuddy & Vogel, 2014; Meldrum & Clark, 2013; Miller & Morris, 2014). However, online social networks are categorically different from traditional peer groups, and it is unclear how the peer influence process operates in online environments.

On the whole, online social networks are much larger than traditional networks and typically consist of a mixture of intimate friends, casual acquaintances, former friends, and a potentially large number of periphery 'friendships.' Given compositional differences between traditional and online networks, it bears to reason that peer influence may differ in online social networks. However, no study to date has explicitly examined whether and how online social network characteristics, such as the size of the peer group, condition the association between peer influence and offending.

We address this issue in two ways. First, building on recent research, we examine whether the nonlinear association between individual and peer behavior observed in studies of traditional peer groups is also characteristic of online social networks. Zimmerman and Messner (2011) demonstrated that exposure to pro-deviant peers influenced individual offending only to a certain point. After this saturation point was met, additional exposure to pro-deviant peers became redundant and had a diminishing effect on self-reported offending (see also Zimmerman & Vásquez, 2011). Given the mixed composition and relatively large size of online networks, it remains unclear if exposure to pro-deviant messages will achieve a saturation point after which they will have diminishing returns.

Second, we examine whether and how network size conditions the association between exposure to pro-deviant peer behavior online and self-reported offending. Both peer group size (McGloin & Piquero, 2009) and the proportion of criminal versus non-criminal messages (Haynie, 2002) have a direct influence on personal behavior. Therefore, the number of peers in one's social group plays an instrumental role in the peer influence process; yet is remains unclear whether the same is true of online networks.

On the one hand, online networks allow for personal interaction with a significantly greater number of friends, many of whom have very peripheral relationships with users. This concentration of non-

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intimate connections may diminish the capacity of online peers to influence individual behavior. Specifically, those embedded in small online networks may be more influenced by exposure to criminal behavior given the concentration of close, intimate peers relative to those in average or large networks. On the other hand, online social networks do not typically differentiate between close, intimate friends and less personal associations. As a result, the influence of intimate peers may be washed out when an abundance of peripheral relationships are present in an online network. Vicarious reinforcement of criminal behaviors by an increased number of friends may also influence personal offending. If these processes are operant, a large number of casual connections may be more effective in reinforcing pro-deviant behavior.

It is imperative for criminologists to understand how peer group processes operate in online networks since the rapid adoption of this mode of communication may provide an additional forum to facilitate the spread of pro-crime messages and behaviors. To address these gaps in the literature, the current study is framed around two overarching research questions. First, does the nonlinear relationship between exposure to peer deviance and self-reported offending observed in the traditional networks characterize online social networks? Second, when holding the level of exposure to criminal messages constant, does network size condition the association between peer deviance online and self-reported offending? To this end, several hypotheses are explicated and empirically evaluated using survey data from 583 undergraduate students at a large mid-southern university.

Literature review

Virtual peer effects and criminal behavior

The use of online networks, specifically social network sites (SNS), has grown tremendously in recent years. For instance, research suggests 90% of persons between the ages of 18 and 29 visit these websites on a regular basis (Duggan & Smith, 2013). A growing body of research is beginning to consider the contribution of online social networks to the development and well-being of adolescents and young adults, and a handful of studies have examined the role of online communication in crime causation. This body of research suggests a direct link between exposure to deviant or criminal behavior online and self-reported deviance or offending (McCuddy & Vogel, 2014; Meldrum & Clark, 2013; Miller & Morris, 2014). This relationship has been observed in both middle and high school (Meldrum & Clark, 2013) and college (McCuddy & Vogel, 2014; Miller & Morris, 2014) samples.

Early studies in this area were framed within Osgood, Wilson, O'Malley, Bachman, and Johnston (1996); Osgood, Anderson, and Shaffer (2005) routine activities approach: time spent in unstructured interaction with peers online would increase the likelihood of engaging in criminal behavior. Indeed, research by Meldrum and Clark (2013) indicates time spent socializing with peers via virtual methods was positively associated with both delinquency and substance use. Weerman, Bernasco, Bruinsma, and Pauwels (2013) present similar findings, although their results suggest traditional (i.e., face-to-face) interaction is a much stronger predictor of offending than time spent socializing online. Overall these studies consistently found that unstructured online socialization was linked with personal criminal behavior.

Recent studies in this vein shifted focus from time spent socializing online to information shared among peers in online environments. For instance, Miller and Morris (2014) examined the effects of virtual and traditional peers by applying Akers (2009) social learning theory in the examination of both online and offline offending. They found virtual groups may be just as applicable in explaining peer effects on personal offending as traditional interaction. Morris and Higgins (2010) also found key tenants of social learning theory describe the likelihood that individuals will engage in digital piracy. Additionally, McCuddy and Vogel (2014) found a link between exposure to criminal and deviant behavior discussed or displayed in social networks and self-reported offending. Their results demonstrated a strong degree of behavioral concurrency between exposure to criminal behavior online and personal offending.

A major limitation of these studies as a whole is the inability to distinguish between selection and social learning. The selection, or behavioral homophily perspective, suggests that individuals self-select into groups that represent their current identity. That is, "birds of a feather flock together" (e.g., Gottfredson & Hirschi, 1990). The social learning perspective incorporates Akers (2009) and Sutherland's (1947) principles that the learning of criminal behavior takes place in intimate peer groups where interpersonal interaction transmits the techniques, rationalizations, and motivations for engaging in criminal or deviant behavior. McCuddy and Vogel (2014) speculated that either process may be functioning in online networks and establishing behavior concurrency in studies of online socialization is imperative before conducting further theoretical tests of either perspective.

As a whole, these studies provide some evidence that online peer influence operates similarly to traditional peer influence. This suggests online interaction is merely an extension of in-person communication. However, online networks are qualitatively different from traditional peer groups. Online networks allow for personal interaction with a significantly greater number of friends (Acar, 2008). While much online interaction occurs with friends met offline, social network sites, such as Facebook, allow users to maintain frequent contact with distant acquaintances, persons with whom they may otherwise interact on a very limited basis (Pempek, Yermolayeva, & Calvert, 2009). The vastness of cyberspace allows friendships to transcend geographic limits. Online networks allow users to maintain communication with peers who may have traditionally been knifed off due to changes in residence, schools, employment, or educational circumstances. As a result, individuals may be exposed to models of behavior otherwise absent in their traditional networks.

Nonlinearity in traditional networks

Two decades ago, Tittle (1995) claimed an inherent weakness of traditional criminological theories is the assumption that an increase in the causal variable will be proportionate to the effect on the independent variable, implicitly assuming a linear relationship. Ten years later, Agnew (2005) argued both "ceiling" and "threshold" effects might be evident when examining causal variables in models testing a variety of theories. Agnew proposed a certain level, or threshold, must be passed in order for meaningful effects to be detected. Additionally, he hypothesized there may be a "ceiling," after which causal variables will have little or no effect on crime. Taking these propositions into consideration, studies have begun to examine the functional form of the associations between traditional criminological variables and criminal behavior.

Zimmerman and Messner (2011) speculated a nonlinear model might best describe the relationship between personal deviant behavior and exposure to deviant peers. Specifically, they proposed a saturation point in the effect of peer influence on self-reported offending, after which exposure to additional delinquent peers becomes redundant and has diminishing effects on individual behavior. This saturation point is likely to be observed because "a bountiful supply of such peers already exists and any pro-violence messages additional peers might convey will be somewhat redundant and, thus, not particularly consequential" (p. 875). Using data from the Project on Human Development in Chicago Neighborhoods (PHDCN), their findings support this claim, indicating the effect of exposure to peer violence on self-reported violence becomes weaker at very high levels of exposure to peer delinquency. In a subsequent study using the same data, Zimmerman and Vásquez (2011) reported a similar nonlinear relationship between substance using peers and individual substance use. Research by Burt and Rees (2014) comports with these findings, suggesting the association between individual substance use and exposure