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### Adolescent sexual risk behavior on the internet

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## **The Influence of Descriptive and Injunctive Peer Norms on Adolescents' Risky Sexual Online Behavior**

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### **Abstract**

The aim of this study was to investigate the influence of descriptive and injunctive peer norms on the engagement in risky sexual online behavior. A four-wave longitudinal study among a representative sample of 1,016 Dutch adolescents (12-17 years old) was conducted. Two autoregressive cross-lagged structural equation models were analyzed to investigate the relationship between perceptions of peer norms and risky sexual online behavior. The findings of this study indicate that both, descriptive and injunctive peer norms, predicted adolescents' engagement in risky sexual online behavior. The effect of descriptive peer norms was stronger and more consistent over the four waves. As expected, perceptions of peer norms were predictors, but not consequences, of risky sexual online behavior. The findings suggest that problematic behaviors on the internet are influenced by perceptions of what peers do, or approve of, in ways similar to offline risk behaviors.

## **The Influence of Descriptive and Injunctive Peer Norms on Adolescents' Risky Sexual Online Behavior**

Adolescents today spend considerable parts of their leisure time on the internet. While using the internet, adolescents may engage in rather risky online behavior, such as sending intimate information to strangers online or searching for sexual partners online (Livingstone, & Helsper, 2008; Ybarra, Mitchell, & Finkelhor, 2007). Although increasing numbers of studies have focused on the prevalence of adolescents' risky sexual online behavior, less is known about *why* adolescents engage in these behaviors. Specifically, online risk research has been criticized for ignoring the offline lives of youth, including their friends and peers, when explaining online activities (Livingstone & Haddon, 2008).

Among the influences in adolescents' offline lives, peers may play an important role in explaining risky online behavior. During adolescence, individuals' social orientation shifts markedly from parents to peers (Guyer, McClure-Tone, Shiffrin, Pine, & Nelson, 2009; Michael & Ben-Zur, 2007). As a consequence, peer norms become directive for adolescents and strongly influence their risk behavior (Arnett, 2007; Bauman & Ennett, 1996). The aim of the present study is to investigate the influence of peer norms on adolescents' risky sexual online behavior.

### **Social Norms Theory**

One of the theories that explains why peers influence adolescents' risk behavior is social norms theory (Berkowitz, 2005). This theory assumes that peer influence is based on adolescents' beliefs about the norms that are prevalent among their peers (Berkowitz, 2005). Social norms can typically be divided into descriptive and injunctive peer norms (Borsari & Carey, 2003). Descriptive peer norms are adolescents' perceptions about the quantity and frequency of a certain risk behavior among peers. Injunctive peer norms are beliefs about the approval of a behavior among peers. Descriptive and injunctive norms are adolescents' subjective beliefs about their peers' behavior and approval (Borsari & Carey, 2003), and therefore, they may be based on misperceptions of peer norms (Prentice & Miller, 1993, 1996; Schroeder & Prentice, 1998).

A growing number of studies conducted within social norms theory have indicated that adolescents' problem behavior is influenced by descriptive and injunctive peer norms (Berkowitz, 2005; Borsari & Carey, 2003; Prentice & Miller, 1993, 1996; Schroeder & Prentice, 1998; Rimal & Real, 2003; Larimer, Turner, & Mallett, 2004). Individuals are willing to comply with perceived group norms because they are afraid of sanctions, such as being excluded from the group (Rimal & Real, 2003). The norms that are prevalent within a group are constructed and disseminated through communication (Rimal & Real, 2003). Most

of the studies on social norm theory focus on prevalent problem behaviors which generally take place in a social context, such as smoking or drinking alcohol (Borsari & Carey, 2003). For these types of behaviors, social norms within a group may be clearly articulated because adolescents typically talk about these behaviors and engage in them together.

Less is known about the impact of perceived peer norms on adolescents' risky sexual online activities. The influence of peers may be different for risky online activities because, in contrast to typical adolescent risk behaviors, such as drinking or smoking, adolescents may not engage in risky online activities in a group context. Engagement in risky sexual online behavior is much more private, and peer pressure may be weaker. Moreover, previous studies have shown that these behaviors are uncommon among adolescents (Baumgartner, Valkenburg, & Peter, 2010a; Liau, Khoo, & Ang, 2005). As a result, adolescents may have less knowledge about the existing group norms concerning risky sexual online behavior. Nevertheless, the findings of a recent study suggest that perceptions of descriptive peer norms affect risky sexual online behavior (Baumgartner, Valkenburg, & Peter, 2010b). Adolescents who perceived their friends engaging in risky sexual online behavior, such as sending intimate pictures or videos to strangers online, were likely to subsequently engage in these behaviors as well. This finding indicates that perceptions of descriptive peer norms may be important even in the context of less prevalent and more private behaviors.

Whereas the aforementioned study suggests that online behavior is related to descriptive peer norms, the role of injunctive peer norms in risky sexual online behavior is still unclear. However, it seems plausible to assume that perceiving others to approve of risky sexual online behavior may lead to an increased willingness to engage in these behaviors. For example, Real and Rimal (2007) and Larimer et al. (2004) have shown that injunctive peer norms may be even more predictive of intentions to drink alcohol than descriptive peer norms. Especially for less prevalent behaviors, such as engagement in risky sexual online behavior, assumptions about peer approval may be influential. Even if adolescents do not think that their friends engage in these behaviors, they may have implicit assumptions about their friends' opinions concerning these behaviors. Adolescents may be willing to engage in risky sexual online behavior only if they believe their friends would approve of such behavior.

### **Causal Relationship Between Perceived Peer Norms and Behavior**

While the relationship between peer norms and risky behaviors has often been demonstrated, the causality of the effect is less clear. Most studies in social norms theory have investigated only the effect of social norms on risky behavior. However, risky behavior may equally well have an influence on subsequent perceptions of peer norms. This inverse causal relationship between behavior and perceived peer norms is compatible with cognitive

dissonance theory (Festinger, 1957) and the false consensus effect (Ross, Greene, & House, 1977). To avoid cognitive dissonance when engaging in risky sexual online behavior, individuals may justify their behavior by claiming that others do the same thing. By exaggerating the number of friends who engage in this behavior, adolescents may downplay possible negative consequences of such behavior. Thus, adolescents may cognitively normalize their behavior by judging their peers' behavior and approval to be consistent with their own behavior and perceptions. Within social norm theory, it has often been assumed that perceived peer norms are not based on accurate estimations of peer behavior but on misperceptions. These misperceptions may be the result of cognitive dissonance processes leading to a false consensus effect, that is, the tendency of people to overestimate their similarity with others (Lewis, Lee, Patrick, & Fossos, 2007; Ross, et al., 1977). Therefore, perceptions of descriptive and injunctive norms may not only be predictors but also consequences of individuals' engagement in risky sexual online behavior (Gerrard, Gibbons, Benthin, & Hessling, 1996; Lewis, Lee, Patrick, & Fossos, 2007).

### **Current Study**

The present study investigates the role of injunctive and descriptive peer norms in the explanation of risky sexual online behavior by using a four-wave longitudinal design. We expect that descriptive and injunctive peer norms have an influence on risky sexual online behavior over and above the effect of other predictors such as age, gender, and frequency of online communication. Moreover, we investigate whether peer norms are predictors or consequences of risky sexual online behavior. By investigating the role of social norms for risky sexual online behavior, the current study advances our knowledge in three respects. First, the study sheds light on the predictors of engagement in risky sexual online behavior. Knowing these predictors is important in order to prevent such behavior in the future. Many prevention programs have successfully used a social norms intervention strategy (Berkowitz, 2005; Schroeder & Prentice, 1998, Mattern & Neighbors, 2004). These prevention programs normally target perceptions of either descriptive or injunctive peer norms. Prevention programs targeting peer norms can be effective only if it is known whether and which of these perceptions influence risky sexual online behavior.

Second, this study may advance social norms theory by testing whether it is also applicable to less prevalent and more intimate online behaviors. If social norms are predictors of sexual online behavior, the validity of the social norms approach could be extended to online behaviors. Finally, the present study may advance the knowledge of the causal relationship between perceived peer norms and risky sexual online behavior.

## Method

### Procedure

A four-wave longitudinal study with a representative sample of 1,765 Dutch adolescents was conducted. Adolescents were surveyed four times with a six-month time lag. Participants were 12 to 17 years of age with a mean age of 14.49 years ( $SD=1.68$ ) in the first wave. Sampling and fieldwork were performed by Veldkamp, a Dutch research institute. In the first wave, 1,765 adolescents completed the questionnaire (initial response rate: 84%). Of the 1,765 adolescents who completed the first questionnaire, 1,445, 1,206, and 1,016 participated in waves 2, 3, and 4, respectively. The attrition rates ranged from 18% to 16%. We only included the 1,016 adolescents who participated in all four waves in the analyses (50.3% females). Institutional approval and parental consent for adolescents' participation were obtained.

### Measures

**Risky sexual online behavior.** Risky sexual online behavior was assessed with four items. Participants indicated on a 5-point scale ranging from 0 (*never*) to 4 (*six times or more*) how often, in the last six months, they had participated in one of the following activities: 1) searching for someone on the internet with whom to talk about sex; 2) searching for someone on the internet with whom to have sex; 3) sending a photo or video in which they were partly naked to someone they only knew online; and 4) sending an address or telephone number online to someone they only knew online. Because the prevalence of these behaviors was very low, we recoded the variables into binary variables, 0 (*never*) and 1 (*engaged in risks at least once*). The resulting four binary risky sexual online behavior variables were added, resulting in a count variable of risky sexual online behavior. This new variable had values from 0 to 4. Mean scores (standard deviations in parentheses) for the four waves were 0.24 (0.61), 0.21 (0.58), 0.17 (0.54), 0.17 (0.51), respectively.

**Descriptive peer norms.** To measure descriptive peer norms, adolescents indicated for each of the four risk behaviors on a 5-point scale ranging from 0 (*no one*) to 4 (*nearly all of my friends*) how many of their friends showed this behavior. Cronbach's alpha of the resulting scales ranged from .72 to .78 for the four waves. Mean scores (standard deviations in parentheses) for the four waves were 0.41 (0.51), 0.38 (0.49), 0.40 (0.55), 0.40 (0.51), respectively.

**Injunctive peer norms.** Injunctive peer norms were measured by asking adolescents to rate how much their friends approved of each of the risky sexual online behaviors. For example, one question read "What do your friends think of searching on the internet for someone to talk about sex?" Answer categories ranged from 0 (*not at all ok*) to 4 (*very*

*acceptable*). Cronbach's alpha for the four items ranged from .78 to .82 in the four waves. Mean scores (standard deviations in parentheses) were 0.74 (0.75), 0.73 (0.70), 0.74 (0.73), 0.75 (0.71), respectively.

**Control variables.** Gender, age, and frequency of internet communication were included as control variables. Gender and age were included because it may be assumed that engagement in online risk behavior varies according to age and gender (Baumgartner et al., 2010a). Moreover, susceptibility to peer influence may also be influenced by age and gender (Steinberg & Monahan, 2007). The frequency of internet communication was included because it has been a predictor of risky online behavior in previous research (Baumgartner et al., 2010b; Livingstone & Helsper, 2007). To measure the frequency of internet communication, participants indicated how often they use instant messaging, internet chats, and social networking sites. The response categories ranged from 0 (*never*) to 10 (*every day*). The three variables composed an additive scale, with means scores (standard deviations in parentheses) of 4.52 (2.18), 4.65 (2.16), 4.84 (2.15), 4.82 (2.13).

## Data Analysis

**Autoregressive cross-lagged models.** To investigate the influence of descriptive and injunctive peer norms on risky sexual online behavior, we analyzed two autoregressive cross-lagged panel models (see Figures 4.1 and 4.2). By including autoregressive effects, the model controls for past behavior in each wave and thus increases the validity of the influence of a specific construct at Time  $N$  on the construct at Time  $N+1$  (Schlüter, Davidov, & Schmidt, 2006). The cross-lagged paths represent the causal-correlational relationship between peer norms and risky sexual online behavior. To control for potentially confounding variables, we included the three control variables in the model.

The two models were tested with structural equation modeling. The variable for risky sexual online behavior was a manifest count variable of participation in risky behavior. The peer norm variables in our models represented latent variables. For these variables, two 2-item parcels were used as indicators of the latent construct (Matsunaga, 2008). Error terms of the same indicators over time and disturbances within time were correlated. For all control variables, manifest variables were used. To check whether the skewness of the variables may have affected the analyses, we ran bootstrap analyses for the models (bias-corrected 95% confidence interval, 1000 bootstrap samples,  $N=1,016$  each) (Efron & Tibishirani, 1993).

## Results

### Cross-lagged Models

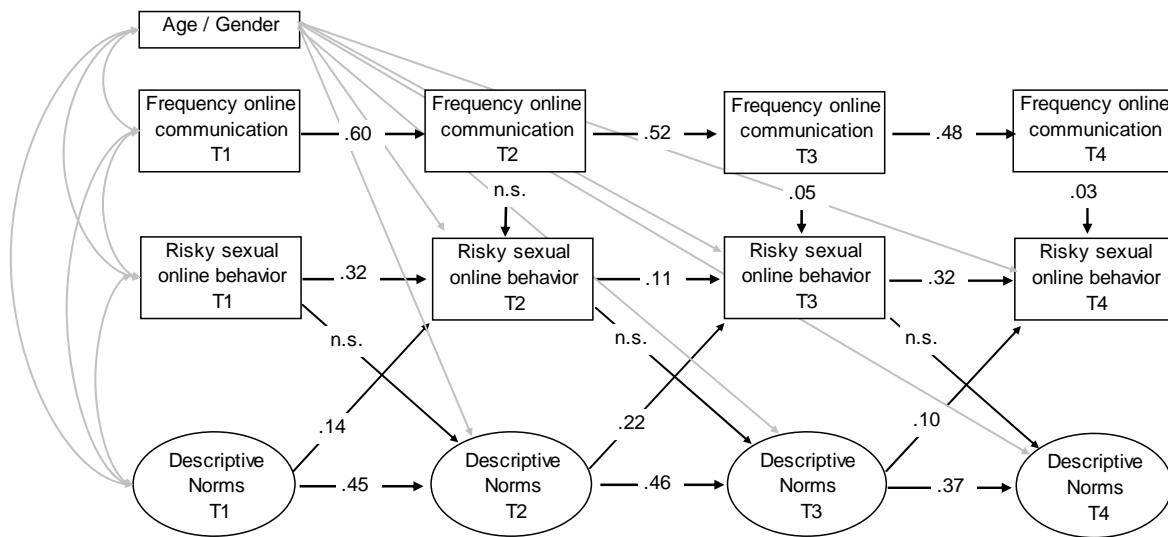
To analyze whether descriptive peer norms predicted risky sexual online behavior, we analyzed the model as shown in Figure 4.1. The model indicated an excellent fit to the data (CFI = .99, RMSEA = .02 [90% CI: .01/.03]), SRMR = .02,  $\chi^2/df=1.56$ ). Engagement in risky sexual online behavior had a moderate stability over time. As can be seen in Figure 4.1, descriptive peer norms predicted engagement in risky sexual online behavior in all of the waves. More specifically, descriptive peer norms at Time 1 had a significant effect on risk engagement at Time 2,  $B = .14$ ,  $SE = .08$ ,  $p < .05$  (bootstrap bias-corrected 95% CI [bc 95% CI]: .004/.32). Time 2 descriptive norms predicted Time 3 risk engagement,  $B = .22$ ,  $SE = .06$ ,  $p < .01$  ([bc 95% CI]: .13/.34), and Time 3 peer norms predicted Time 4 risk engagement,  $B = .10$ ,  $SE = .04$ ,  $p < .01$  ([bc 95% CI]: .03/.19). None of the reverse paths from risk engagement to descriptive peer norms was significant. The effects of descriptive peer norms on risk engagement were significant despite controlling for past behavior, sex, age, and frequency of internet communication.

Analyzing the model for injunctive peer norms yielded similar but less consistent results. The model fit for injunctive peer norms was also excellent (CFI = 1.00, RMSEA = .01 [90% CI: .00/.02], SRMR = .02,  $\chi^2/df = 1.20$ ). As can be seen in Figure 4.2, injunctive norms at Time 1 did not predict risky sexual online behavior at Time 2,  $B = .03$ ,  $SE = .03$ ,  $p = .24$  ([bc 95% CI]: -.02/.11). Estimations of injunctive norms at Time 2 and Time 3, however, were significant predictors of subsequent online risk engagement,  $B = .10$ ,  $SE = .03$ ,  $p < .01$  ([bc 95% CI]: .04/.17) for Time 2 on Time 3 and  $B = .04$ ,  $SE = .02$ ,  $p = .05$  ([bc 95% CI]: .00/.09) for T3 on T4. Moreover, for injunctive peer norms, none of the reverse paths from risk engagement to injunctive peer norms was significant.

The frequency of internet communication had a small but significant influence on risk behavior at Time 3 and 4 ( $B = .05$ ,  $p < .01$ ;  $B = .03$ ,  $p < .01$ ). Age was negatively related to risky sexual online behavior only at Time 4, and this effect was small ( $B = -.02$ ,  $p < .05$ ). Gender was a significant predictor of risky sexual online behavior for Time 2 and Time 3 ( $B = -.08$ ,  $p < .05$ ;  $B = -.09$ ,  $p < .01$ ), with boys engaging in somewhat more risky behavior.

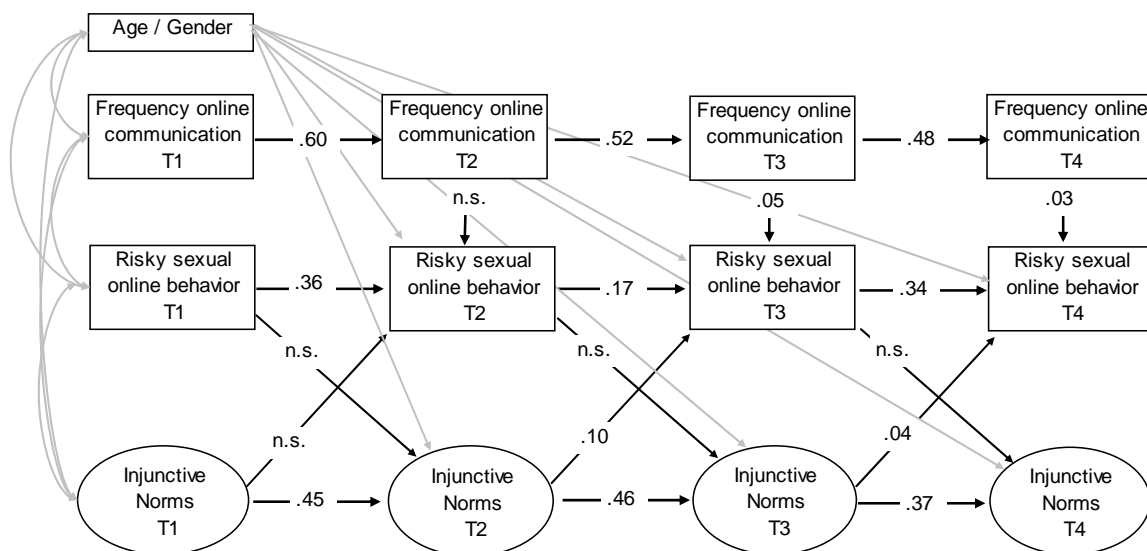


**Figure 4.1.** Model of the Influence of Descriptive Peer Norms on Risky Sexual Online Behavior



*Note.* To simplify presentation, observed indicators and their correlated measurement errors over time as well as correlated disturbances of indicators within time are not shown. Also, regression paths of the same factors between Time 1 and Time 3, Time 1 and Time 4, and Time 2 and Time 4 are not presented.

**Figure 4.2.** Model of the Influence of Injunctive Peer Norms on Risky Sexual Online Behavior



*Note.* To simplify presentation, observed indicators and their correlated measurement errors over time as well as correlated disturbances of indicators within time are not shown. Also, regression paths of the same factors between Time 1 and Time 3, Time 1 and Time 4, and Time 2 and Time 4 are not presented.

## Discussion

This study showed that descriptive and injunctive peer norms predicted adolescents' engagement in risky sexual online behavior. The effect of descriptive peer norms, however, seemed to be stronger and more consistent than the effect of injunctive peer norms in the four waves. This finding suggests that the perceived behavior of peers may be more important in the explanation of adolescents' risky sexual online behavior than what adolescents perceive their peers to approve of.

The finding that descriptive norms consistently predicted risk engagement is in line with previous findings showing that, especially for socially unapproved behavior, descriptive peer norms are more directive for behavior than injunctive peer norms (Manning, 2009). Adolescents may only have vague assumptions about their friends' general approval of risky sexual online behavior. Therefore, the perceived behavior of peers may carry an important informational component suggesting that it may be acceptable to engage in a specific behavior.<sup>31</sup> Thus, adolescents may be inclined to engage in risky sexual online behavior if they perceive their friends to engage in it (Buunk & Bakker, 1995). Friends' perceived behavior may thus be a more tangible indicator of peer norms than the estimations of peer approval.

The findings of this study are important for the prevention of risky sexual online behavior. The effect of descriptive peer norms was consistent over the four waves and was stronger than the effect of age, gender, and frequency of online communication. Because descriptive norms were more predictive of subsequent engagement in risky sexual online behavior than injunctive peer norms, potential preventions should target descriptive peer norms rather than injunctive norms. Several studies have shown that social norm interventions targeting adolescents' perceptions of peer norms are successful (Berkowitz, 2005; Schroeder & Prentice, 1998). These interventions normally raise the awareness of potential overestimations of peer behavior. By showing adolescents that most peers do not engage in a certain behavior and that their perceptions of their friends' behavior are most likely inflated, the influence of peer norms can be reduced (Berkowitz, 2005; Schroeder & Prentice, 1998)

This study also has implications for social norms theory. The finding that social norms are also important in the explanation of less prevalent intimate online behaviors suggests that social norms theory has a broader scope than is generally assumed. Moreover, using multiple time assessments, the finding that peer norms consistently predicted behavior further supports social norms theory. Most important, however, our causal-correlational design showed that peer norms predicted engagement in risky sexual online behavior, whereas an inverse relation could not be found. This finding suggests that perceptions of the prevalence of peer behavior and of peers' approval of this behavior influence future behavior

and not vice versa. The relationship between peer norms and risk behavior is thus not based on cognitive dissonance strategies but on the willingness of individuals to comply with prevailing peer norms. Thus, the findings strengthen previous theoretical assumptions that perceived norms influence behavior, rather than that they are correlates or consequences of behavior.

The findings of this study should be interpreted within the limitations of this study. To assess risky sexual online behavior, we used four items. Although our items were based on previous research and theoretical considerations, they do not present established measurements. The interpretation of our results, thus, should be limited to the four online behaviors we measured. Nevertheless, the study underlines the importance of perceived peer behavior and peer approval in adolescents' online activities. Future research should therefore further investigate the role of peers in adolescents' risky online behaviors.

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