

# Adolescents' Conformity to Their Peers' Pro-Alcohol and Anti-Alcohol Norms: The Power of Popularity

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**Background:** Research on adolescent development suggests that peer influence may play a key role in explaining adolescents' willingness to drink, an important predictor of drinking initiation. However, experiments that thoroughly examine these peer influence effects are scarce. This study experimentally examined whether adolescents adapted their willingness to drink when confronted with the pro-alcohol and anti-alcohol norms of peers in a chat room session and whether these effects were moderated by the social status of peers.

**Methods:** We collected survey data on drinking behavior, social status, and willingness to drink among five hundred thirty-two 14- to 15-year-olds. Of this sample, 74 boys participated in a simulated Internet chat room session in which participants were confronted with preprogrammed pro-alcohol or anti-alcohol norms of "grade-mates" which were in fact preprogrammed e-confederates. Accordingly, we tested whether participants adapted their willingness to drink to the norms of these grade-mates. To test whether adaptations in participants' willingness to drink would depend on grade-mates' social status, we manipulated their level of popularity.

**Results:** The results indicated that adolescents adapted their willingness to drink substantially to the pro-alcohol (i.e., more willing to drink) as well as anti-alcohol (i.e., less willing to drink) norms of these peers. Adolescents were more influenced by high-status than low-status peers. Interestingly, the anti-alcohol norms of the popular peers seemed most influential in that adolescents were less willing to drink when they were confronted with the anti-alcohol norms of popular peers. Additionally, the adolescents internalized these anti-alcohol norms.

**Conclusions:** This study gives more insight into peer influence processes that encourage or discourage alcohol use. These results could be fundamental for the development of prevention and intervention programs to reduce alcohol use among the adolescents.

**Key Words:** Peer Influence, Drinking Norms, Adolescents, Popularity.

EARLY DRINKING ONSET and excessive drinking during adolescence are associated with an increased risk for developing substance use and health-related problems later in life (Chen et al., 2008; Grant et al., 2001; Norstrom and Ramstedt, 2005; Theobald et al., 2001). Besides these long-term consequences, adolescent alcohol use may also result in short-term negative health consequences, such as aggression (Huang et al., 2001), motor vehicle accidents, unprotected sex (Bonomo et al., 2001), and vandalism (Felson et al., 2008). Although underage drinking is illegal and/or discouraged by national and local health authorities,

a considerable part of the adolescent population initiates drinking at an early age or manifests heavy drinking patterns. Research indicates that 43% of European adolescents between 15 and 16 years old engage in binge drinking within a 1-month period, and at least half of adolescents use alcohol before the age of 13 (Hibell et al., 2009). More than 17% of the American youth between 12 and 20 years old report binge drinking in a 1-month period and 5.5% report heavy drinking (Substance Abuse and Mental Health Services Administration, 2009).

Because of the aversive consequences of alcohol, it is important to study the predictors of adolescents' drinking in order to establish possible targets for alcohol preventive interventions. Research on adolescent alcohol consumption has revealed that peers' drinking is one of the strongest correlates of adolescent alcohol use (e.g., Björkqvist et al., 2004; Hawkins et al., 1992). Peer influence is therefore considered to be one of the most important predictors of alcohol use in adolescence. Despite the significance that is attached to peer influence, it has not been rigorously tested and theoretical explanations are needed that focus on influence processes when adolescents are exposed to peers in drinking situations.

Young adolescents usually have little drinking experience. As a consequence, their anticipated physiological reactions

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to alcohol (e.g., whether they feel relaxed or energetic after drinking) are not yet important motivations to start drinking. Additionally, adolescents' alcohol initiation largely depends on reactions to specific social situations rather than that it is planned or intended. Adolescents often encounter situations in which the opportunity to drink arises and they could respond to that situation without premeditation (Gibbons et al., 2003). To obtain a proxy of this unplanned reaction, adolescents are asked to indicate how they would react in a specific situation in which they have the opportunity to drink. Although adolescents might not have clear intentions to drink, it is expected that they have a notion of how they might react in specific situations. Gibbons and colleagues (2003) describe this as "behavioral willingness." As willingness involves little thinking about the behavior or its consequences, longitudinal studies showed that it is a stronger predictor of risk behavior such as alcohol initiation than behavioral intentions, especially among the young adolescents (Gerrard et al., 2002; Gibbons et al., 1998a,b; Pomery et al., 2009).

Because drinking is a social activity for adolescents—their almost never drink by themselves—their willingness to drink in a specific situation largely depends on its social consequences (Gibbons et al., 2003; Pomery et al., 2009). During adolescence, peer relationships become more strongly valued and this period is characterized by increased attention to the opinion of peers and higher sensitivity for peer approval (Burnett et al., 2011; Nelson et al., 2005; Steinberg, 2008). This could indicate that adolescents are more willing to drink when they aim to prevent negative evaluations by peers (Schroeder and Prentice, 1998). Peer norms would in this case play a crucial role, as peer norms provide indirect information about what drinking behaviors are appropriate and respected and accordingly what behaviors will likely lead to social acceptance (Borsari and Carey, 2001). Indeed, several studies showed that peer norms are predictive of adolescents' willingness to drink (Blanton et al., 1997; Gibbons et al., 2004; Ouellette et al., 1999).

Adolescence is an important transitional phase in which adolescents' alcohol norms change from abstinence to drinking. Although peer norms are widely believed to affect adolescents' willingness to drink, there is little understanding of how these peer influence processes operate. Before effective intervention strategies can be developed to reduce the encouraging effects of peer norms on adolescents' willingness to drink, it is crucial to gain insight in these peer influence processes and to understand which peers have the strongest influence on adolescents' willingness to drink. Additionally, research is lacking on whether adolescents are only influenced by peer norms that promote drinking or also by norms that promote little or no drinking. Several theories propose that adolescents will be especially motivated to conform to peers if they expect social rewards (see Cialdini and Trost, 1998). It has been suggested that adolescents may be most likely to conform to peer norms if these peers have a desirable social image and if adolescents believe that by adapting

to these peer norms they may obtain some of these peers' characteristics (Gerrard et al., 2002; Gibbons et al., 2003). Peers with a high social status are admired and are therefore able to influence others (Cillessen and Rose, 2005; Cohen and Prinstein, 2006; Prinstein and Cillessen, 2003). Adolescents may believe that conformity to high-status peers will allow them access to desirable resources (i.e., increasing their own social status) (Moffitt, 1993). Additionally, because adolescents believe that the status of the peers they conform to might affect their own status, adolescents may try to avoid assimilation with low-status peers (Cohen and Prinstein, 2006; Kinney, 1993).

Previous research primarily addressed the influence of friends in general and did not take social status within the larger peer network into account. Indeed, research suggests that individuals are more strongly influenced by their close friends than by more distant peers (Baer et al., 1991; Yanovitzky et al., 2006). However, whether peers will influence an adolescent largely depends on the salience of these peers to the adolescent, and perceived popular peers are found to be especially salient during adolescence (Cillessen and Rose, 2005; Prinstein et al., 2003). Focusing solely on the influence of friends could then lead to an underestimation of peer influence when popular peers or even peers who are very unpopular are not included in studies (Brown et al., 2008). Unpopular peers represent a negative social status, which adolescents may actively try to avoid. We will therefore examine the influence of popular and unpopular peers' drinking norms on adolescents' willingness to drink.

Additionally, earlier research mainly focused on the negative effects of peer influence on alcohol use, such as the early initiation of drinking and engagement in heavy, risky drinking patterns. Nonetheless, there is no rationale why peer influence should be negative per definition (Allen and Antonishak, 2008). Cross-sectional studies suggest that having friends who show prosocial behaviors predicts less engagement in violent behavior and lower levels of alcohol use (Prinstein et al., 2001; Spoth et al., 1996). Another study showed that adolescents who were aggressive at time 1 were less aggressive at time 2 when they had nonaggressive friends (Adams et al., 2005). In a longitudinal study, Maxwell (2002) found that a same-sex friend could not only influence alcohol initiation and maintenance, but also influence abstinence and discontinuation of alcohol use. These studies are indicative of peer influences that reduce deviant behavior. In this study, we will focus on the influence of both peer norms that encourage alcohol use and peer norms that discourage alcohol use. Studying the negative as well as the positive effects of peer drinking norms and exploring which peers are most influential might lead to new insights into peer influence processes that could have important implications for alcohol prevention.

The central hypothesis of this study is that adolescents will be more likely to conform to the drinking norms of popular peers and to reject the norms of unpopular peers. In an experimental design, we tested whether male adolescents

adapted their willingness to drink when confronted with ostensible peers who communicated either pro-alcohol or anti-alcohol norms. The reason that we focus on boys is that there is some evidence that men experience more social pressure to drink than women (Suls and Green, 2003). Additionally, boys seem to be more influenced by relationships at the group level, while dyadic relationships seem more influential for girls (Rose and Rudolph, 2006). The social status of the peers in the chat room was experimentally manipulated, resulting in either popular or unpopular status. Adolescents were asked to respond to drinking scenarios in a simulated Internet chat room (cf. Cohen and Prinstein, 2006). The use of chat rooms is a common way of peer online communication among adolescents (Van den Eijnden et al., 2008) and is comparable to social networking sites like Facebook or forums, which are all characterized by interactions with peer groups. Adolescents were told that their answers to the drinking scenarios were also visible to the ostensible peers in the chat room. However, if adolescents then adapted their answers to the norms of their peers, it would be unclear whether they had conformed to make a good impression or whether they really accepted and internalized these peer norms. To answer this question, adolescents were asked to answer the same drinking scenarios in an additional "offline" session in which they believed that their answers were invisible to their peers (cf. Cohen and Prinstein, 2006).

Using an experimental design to study the influence of peer norms has several advantages over cross-sectional and longitudinal designs that have predominantly been used in previous studies. First, cross-sectional designs do not allow a proper distinction between influence and selection processes. Adolescents tend to select friends with drinking behaviors like their own, which could indicate that the similarity between adolescents' alcohol use and peer drinking norms is mainly caused by selection processes (Bauman and Ennett, 1996). Second, an important restriction of most longitudinal studies is the use of retrospective self-reported data to deduce peer influence processes. Asking adolescents how much they and their peers drank in the past week does not capture real-time peer influence processes. Measuring real-time peer interactions instead would prevent biases in self-reports and would gain insights into the moment at which the influence occurs (Bot et al., 2007). Third, many studies assess peer norms by asking adolescents to indicate how much their peers drink which in fact reflects the adolescents' perceptions of norms. Research that included both perceived and actual descriptive norms found that adolescent drug use was more strongly related to perceived peer norms than to actual peer norms (Bauman and Ennett, 1996; Iannotti and Bush, 1992; Perkins et al., 2005; Rice et al., 2003). It seems that people project their own behavior to others, which means that using the perception of norms as indicator of peer influence processes could lead to an overestimation of peer influence (Bauman and Ennett, 1996; Norton et al., 2003). Applying an experimental design will overcome these limitations and may result in a thorough examination of causal relationships

between peer influence, social status, and adolescent alcohol use.

## MATERIALS AND METHODS

### *Participants*

Our study consisted of 2 parts: a pretest including class questionnaire assessments and a chat room experiment. The pretest included 532 adolescents (46% boys) of 4 high schools in the Netherlands. Participants' average age was 14.3 years ( $SD = 0.72$ ). The majority was of Dutch nationality (96.4%) and 62.7% of the total sample had ever drunk alcohol. The data were collected in 14 second-grade classes and 9 third-grade classes of higher general secondary education and preuniversity education. The Dutch school system is different from the school system in the United States and some other Western countries; for example, the second and third grades in the Netherlands are equivalent to the eighth and ninth grades in the United States. Dutch schools are differentiated by academic levels; higher general secondary education and preuniversity education are the 2 highest levels (see De Bruyn and Cillessen, 2006).

From this pretest sample, 74 male adolescents were selected to participate in the chat room experiment. Eligibility criteria for the experimental study were as follows: (i) male, (ii) average social status, and (iii) reported to have had drunk alcohol at least once. We included only participants with an average social status because we assumed the effect of peer social status could best be captured in adolescents with an average peer status, because these adolescents may have the opportunity to move both up and down in status. The reason we included only participants who had drunk alcohol before is that, for ethical reasons, we did not want to expose adolescents who had never drunk alcohol to positive drinking norms of peers. The drinking history of the experimental group was comparable to that of the total sample.

### *Procedure*

For the pretest, we recruited relatively small-size schools, with 3 to 5 classes in grades 2 and 3 (higher general secondary education and preuniversity education). Only small schools were included because a prerequisite for the grade-wide sociometric assessment and the chat room experiment was that participants would be acquainted with each other, as described below. Each school provided a list with the names of all students within each class, resulting in a total number of 571 adolescents. The study was approved by the ethical committee of the Faculty of Social Sciences of the Radboud University in Nijmegen, and parents gave passive consent for their offspring's participation ( $n = 570$ ). Data were missing for 36 students who were absent on the day of testing ( $n = 534$ ). Data of 2 participants were excluded because their data were unreliable ( $n = 532$ ). In this pretest, we examined students' peer-perceived popularity and their friendship affiliations using sociometric assessments. Additionally, we assessed students' alcohol use and their willingness to drink in several hypothetical situations.

A few weeks after the classroom assessment, 89 male adolescents with an average social status who reported to have ever drunk alcohol were selected from this sample to participate in the chat room experiment. In our study, we retrieved 2 dimensions of social status: scores on "most popular" and scores on "least popular." For our experimental group, we selected participants who scored neither high on "most popular" nor on "least popular." Per grade, we counted the number of nominations on "most popular" and the number of nominations on "least popular." We computed an average score of these variables and selected participants who scored below average on "most popular" and below average on "least popular." All male adolescents who met this description and who

reported to have ever drunk alcohol were included in the study ( $n = 89$ ). Fourteen participants were removed from the analyses because the experimental manipulation failed, as described below ( $n = 75$ ). Data of 1 participant were excluded because his chat room data were unreliable ( $n = 74$ ).

The chat room experiment had a 2 (popular/unpopular peers)  $\times$  2 (pro-/anti-alcohol) between-subject design. Participants were randomly assigned to 1 of 4 conditions. In the "popular peers and pro-alcohol" condition, participants were led to believe that they were interacting with 3 popular peers, who endorsed pro-alcohol norms. In the "unpopular peers and pro-alcohol" condition, participants were interacting with 3 ostensible unpopular peers, who endorsed pro-alcohol norms. In the "popular peers and anti-alcohol" condition and the "unpopular peers and anti-alcohol" condition, popular or unpopular peers endorsed anti-alcohol norms, respectively.

### Materials

**Sociometric Assessment.** A sociometric assessment was used to measure peer-perceived popularity and friendship affiliations. Peer nominations are considered the most reliable and valid method to measure peer status in adolescence (Jiang and Cillessen, 2005). Participants received a numbered, alphabetized list of all students within their grade and were asked to write down the numbers of the peers who were "most popular" and the peers who were "least popular." Participants could nominate a maximum number of 24 peers for each question. For each student, the number of received nominations was calculated, with a high score on "most popular" indicating high status and a high score on "least popular" indicating low status.

Participants were also asked to write down the numbers of the peers in their grade whom they felt were their "best friends." Again, participants could nominate as many peers as they wanted, with a maximum of 24 peers. These friendship data were used to identify the best friends of the most popular and the least popular peers, which were used as an experimental manipulation of the social status of the e-confederates in the chat room.

**Willingness to Drink.** Willingness to drink is usually assessed by describing a drinking situation and then asking the participants to indicate how willing they would be to take the drink (Gibbons et al., 2003). In our study, willingness to drink was assessed with a similar hypothetical scenario instrument, which was developed for this study. For the construction of this instrument, 4 focus group interviews were conducted (2 with 14-/15-year-old boys and 2 with 14-/15-year-old girls). These groups were asked to come up with examples of situations in which adolescents can choose to drink alcohol with peers or not. As a result, 10 hypothetical drinking scenarios were developed. Examples of scenarios are "You are hanging out with friends outdoors. One of your friends brought along some alcohol and asks if you want some. What would you do?" and "You think one of your friends gave you a coke, but when you taste it, you notice that there is alcohol in it. What would you do?" Answers were given on a 10-point Likert-scale, ranging from 1 (I would certainly not take the alcoholic drink) to 10 (I would certainly take the alcoholic drink). Cronbach's alpha of this willingness to drink instrument in the pretest was 0.96. Supporting the construct validity of this instrument, the scores on the hypothetical scenarios correlated significantly with self-reported alcohol use of the adolescents in the past 7 days ( $r = 0.43$ ,  $p < 0.001$ ). This instrument assessing willingness to drink was used 3 times in this study. First, participants' willingness to drink was assessed in the grade-wide pretest to determine the average response to each scenario. Later, the same scenarios were assessed twice in the chat room experiment: first in an "online" version in which the answers of the participants were visible to the "peers" and the second time in an "offline" version in

which the answers were invisible to the "peers." The scores on the scenarios in the chat room were used as dependent variable.

**Chat Room Experiment.** The selected male participants were invited to take part in our chat room experiment, which applied the same procedures as used by Cohen and Prinstein (2006). Each participant was tested individually in a private room at their school. Participants were told that the goal of our experiment was to study how adolescents communicate with each other over the Internet, and they were led to believe that 3 other male students from their grade were at the same time participating in the chat room in different parts of their school. However, these students were in fact pre-programmed electronic confederates (i.e., e-confederates). To reinforce the impression of a real Internet chat room, the laptop was ostensibly connected to the Internet (with wires), and the researchers made internal fake phone calls to make sure that all participants were ready to enter the chat room at the same time. Participants were asked to respond to a series of questions in the chat room and were told that the order of answering by the participants in the chat room was randomly decided. In reality, the participant was always the last one to answer each question to ascertain that he was exposed to the answers of the e-confederates before giving his own answer.

Before entering the chat room, participants were first asked to type the first name and last initial of their 3 best friends at school and to choose their 2 favorite hobbies of 9 possibilities such as "hanging out with friends," "going out," "reading," or "working with computers." The participants were instructed that they could use this information to become familiar with the other chat room participants, yet in fact we used this personal information to manipulate the popularity of the e-confederates, as described below. Next, participants "logged on" to the chat room and their personal information appeared on screen under their personal response window. To lend credibility to the announcement that participants were logging on, information such as "Downloading participant information" and "Connecting..." was visible on the computer screen. Participants were under the impression that their personal information (names of best friends and hobbies) and their response window were also visible to the 3 other participants in the chat room (the e-confederates), and the participant could also see the personal information and the response windows of each of the 3 other participants. This information remained visible during the experiment.

The popularity of the e-confederates was manipulated by providing the names of their best friends and their hobbies. In the "popular" condition, we placed the first names and last initials of 3 male friends of the most popular peers under the response window of each of the 3 e-confederates. In the "unpopular" condition, we provided the first names and last initials of 3 male friends of the least popular peers under the response window of each e-confederate. To determine whose names should be used for the manipulation of the e-confederates' social status, we made use of the sociometric data collected from the pretest. The sociometric assessment, as described above, identified the peers who were rated as most and least popular. No "controversial" peers who scored high on both popularity and unpopularity were included in the study. The friendship assessment, in turn, indicated who the friends of these most and least popular peers were. Only friends who scored above average on the number of "most popular" nominations ("popular" condition) or above average on the number of "least popular" nominations ("unpopular" condition) were selected to be listed on screen. It was not a prerequisite that the friendships were reciprocal.<sup>1</sup> The

<sup>1</sup>Especially in the unpopular condition, these friendships were not in all cases reciprocal. In 40% of the cases in the unpopular condition, 1 of the 3 named friends was reciprocal; in 33% of the cases 2 of the friends were reciprocal, and in 27% of the cases all 3 named friendships were reciprocal

manipulation of the social status was reinforced with the information on the e-confederates' hobbies. Hobbies that are assumed to be characteristic of popular students, such as playing/watching sports and going out, were placed under the response window of the e-confederates in the "popular" condition. Hobbies that are assumed to be characteristic of unpopular students, such as reading and working with computers, were listed in the "unpopular" condition (cf. Cohen and Prinstein, 2006). To ensure that participants would pay attention to the e-confederates, they were informed that they should give their personal opinion on each of the e-confederates at the end of the experiment.

After participants were acquainted with the 3 e-confederates, they were asked to respond to the same hypothetical scenario instrument as in the pretest to assess their willingness to drink. For each presented scenario, participants could again indicate on a scale ranging from 1 to 10 how willing they would be to take the alcoholic drink. Participants reacted to each scenario after they had seen the preprogrammed answers of the 3 e-confederates, which appeared sequentially in their response windows. The answers of the e-confederates can be divided into 2 types per condition. On 6 of the 10 scenarios (i.e., conformity items), e-confederates gave answers that were approximately 1 SD above the pretest mean score for that scenario (in the pro-alcohol condition) or approximately 1 SD below the pretest mean score for that scenario (in the anti-alcohol condition). Worded differently, the e-confederates' answers on conformity items were programmed in such a way that they reflected more willingness to drink alcohol (in pro-alcohol condition) or less willingness to drink alcohol (in anti-alcohol condition) than the average grade mate. On 4 of the 10 scenarios (i.e., control items), e-confederates gave answers that were equal to the pretest mean score for that scenario. Thus, participants would experience social pressure on the conformity items, but not on the control items. If participants would adapt their responses to the answers of their peers, they would be more willing to drink (or *less* willing in the anti-alcohol condition) in the conformity scenarios than in the control scenarios. Participants' scores for each scenario were standardized and were formed into 2 new variables for each participant: the average score on conformity items and the average score on control items, with higher scores indicating more willingness to drink alcohol.

To test whether participants would privately accept and internalize the drinking norms of their peers, they were asked to respond again to the same set of hypothetical drinking scenarios, but this time after they "logged-off" from the chat room. Participants were told that this time the other "participants" could not see their answers and neither could they see the answers of the other "participants." To reinforce the announcement that it was a private session, information such as "now logging off..." flashed on screen. During this "offline session" only the response window of the participant appeared on screen; the response windows of the other 3 "participants" were removed. Participants read the instruction on screen that we were studying how students communicated via a computer and how they responded when they are alone. They were asked to respond to the same hypothetical scenarios again, and they were told that they could answer in the same way or different than before in the online session. Participants were instructed that at least they should make sure that their answers reflected their own opinion. Again, participants' scores to each scenario were standardized and 2 new variables were created: an average score on conformity items and an average score on control items, with higher scores indicating more willingness to drink alcohol.

Within 1 week after data collection was completed, all participants were debriefed via e-mail. This e-mail contained information about the design and the cover story of the chat room experiment and explained that the other "participants" in the chat room were not real peers, but preprogrammed e-confederates. The e-mail also contained a telephone number and e-mail address of one of the

researchers that participants could use in case they had any further questions or remarks about the experiment.

We conducted separate analyses for the pro-alcohol and anti-alcohol conditions and for the "online" and "offline" sessions.

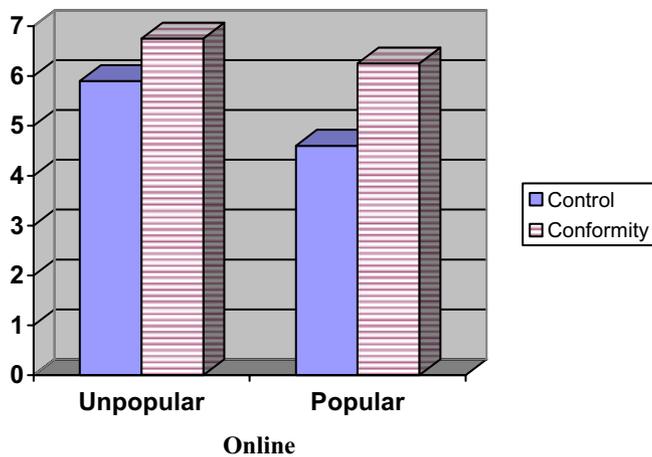
## RESULTS

### *Manipulation Check*

Participants rated the popularity of each of the 3 e-confederates in the chat room on a 5-point scale, ranging from 1 (not popular at all) to 5 (very popular). We computed an average score of the popularity of the e-confederates, which showed that the e-confederates in the "popular" condition ( $M = 3.39$ ,  $SD = 0.47$ ) were rated as more popular than the e-confederates in the "unpopular" condition ( $M = 2.59$ ,  $SD = 0.70$ ),  $F(1, 87) = 41.15$ ,  $p < 0.001$ . However, a more detailed manipulation check revealed that 14 of the 88 participants rated popular e-confederates as unpopular, or unpopular e-confederates as popular, indicating that our manipulation of social status failed for these 14 participants. We therefore excluded their data and conducted further analyses on the data of the remaining 74 participants. This resulted in a stronger difference in popularity ratings between the "popular" ( $M = 3.49$ ,  $SD = 0.41$ ) and "unpopular" conditions ( $M = 2.41$ ,  $SD = 0.64$ ),  $F(1, 72) = 75.78$ ,  $p < 0.001$ .

### *Pro-Alcohol Condition "Online"*

To test whether participants in the pro-alcohol condition would conform to the answers of popular peers and reject the norms of unpopular peers on the conformity items but not on the control items, we conducted repeated-measures analyses of covariance (ANCOVA). The standardized scores on conformity and control items were entered as a within-subject variable and the social status of the e-confederates (condition: popular/unpopular) was entered as a between-subject variable. The pretest scores on the conformity items and the control items were entered as 2 covariates. The results of these analyses are presented in the upper half of Table 1. As predicted, we found an interaction effect between item type (conformity/control items) and confederates' social status (popular/unpopular) (Fig. 1). The simple effects of social status were analyzed with 2 separate ANCOVAs: the first with conformity items as dependent variable and the second with control items as dependent variable. The relevant pretest scores were entered as a covariate. We found an effect of social status for the control items,  $F(1, 31) = 19.60$ ,  $p < 0.001$ ,  $d = -1.37$  (large effect size; Cohen, 1988), indicating that participants scored higher (more willing to drink alcohol) on the control items when they were in the unpopular condition than when they were in the popular condition. No effect was found on the conformity items,  $F(1, 31) = 2.99$ ,  $p = 0.094$ . Additional repeated-measures analyses were conducted with item type (conformity/control) as within-subject factor and pretest



**Fig. 1.** Scores on conformity and control scenarios (i.e., willingness to drink) in the pro-alcohol/online condition. Values are participants' scores on the alcohol scenarios; higher scores indicate more willingness to drink.

scores as covariates. Results showed that participants' scores on the conformity and control items in the "popular" condition differed significantly,  $F(1, 15) = 106.46$ ,  $p < 0.001$ ,  $d = 1.93$  (large effect size). This finding indicates that participants in the "popular" condition scored higher on the conformity items than on the control items. In the "unpopular" condition, this difference was also significant, but less pronounced,  $F(1, 13) = 10.34$ ,  $p = 0.007$ ,  $d = 0.53$  (medium effect size), suggesting that participants conformed to both popular and unpopular e-confederates, but the influence of popular e-confederates was substantially stronger.<sup>2</sup>

#### Anti-Alcohol Condition "Online"

Subsequently, the same analyses were conducted for the anti-alcohol condition (see upper half Table 1). Again, we hypothesized that participants would conform to the answers of the popular peers and reject the norms of unpopular peers, on the conformity items but not on the control items. We found an interaction effect between item type and the social status of the e-confederates (Fig. 2). Two separate ANCOVAs showed a main effect of social status on the conformity items,  $F(1, 37) = 5.89$ ,  $p = 0.02$ ,  $d = 0.48$  (medium effect size), indicating that participants scored lower (less willing to drink alcohol) on the conformity items in the "popular" than in the "unpopular" condition. No effect of social status was found for the control items,  $F(1, 37) = 0.40$ ,  $p = 0.529$ . Repeated-measures analyses within each condition showed a significant difference between the conformity and control items in the "popular" condition,  $F(1, 17) = 20.08$ ,  $p < 0.001$ ,  $d = 0.99$  (large effect size), indicating that participants in the "popular" condition scored lower on the

**Table 1.** Repeated-Measures Analyses on the Effect of Condition (Popular/Unpopular Confederates), Item Type (Conformity/Control), and the Interaction Between Condition and Item Type in the Prediction of Willingness to Drink While Controlling for Pretest Scores<sup>a</sup>

	df	F	p	Partial $\eta^2$
<b>Pro-alcohol "online"</b>				
Covariates				
Pretest conformity items	1, 30	0.35	0.556	0.01
Pretest control items	1, 30	6.50	0.016	0.18
Within groups				
Item type (conformity/control)	1, 30	82.60	0.000	0.73
Between groups				
Social status confederates	1, 30	15.40	0.000	0.34
Interaction				
Item type*social status	1, 30	15.52	0.000	0.34
<b>Anti-alcohol "online"</b>				
Covariates				
Pretest conformity items	1, 36	1.01	0.322	0.03
Pretest control items	1, 36	8.44	0.006	0.19
Within groups				
Item type (conformity/control)	1, 36	16.66	0.000	0.32
Between groups				
Social status confederates	1, 36	0.75	0.392	0.02
Interaction				
Item type*social status	1, 36	10.88	0.002	0.23
<b>Pro-alcohol "offline"</b>				
Covariates				
Pretest conformity items	1, 30	0.00	0.988	0.00
Pretest control items	1, 30	2.07	0.161	0.06
Within groups				
Item type (conformity/control)	1, 30	1.23	0.276	0.04
Between groups				
Social status confederates	1, 30	11.00	0.002	0.27
Interaction				
Item type*social status	1, 30	1.53	0.225	0.05
<b>Anti-alcohol "offline"</b>				
Covariates				
Pretest conformity items	1, 36	1.66	0.206	0.04
Pretest control items	1, 36	9.26	0.004	0.21
Within groups				
Item type (conformity/control)	1, 36	2.11	0.155	0.06
Between groups				
Social status confederates	1, 36	2.49	0.123	0.07
Interaction				
Item type*social status	1, 36	3.19	0.083	0.08

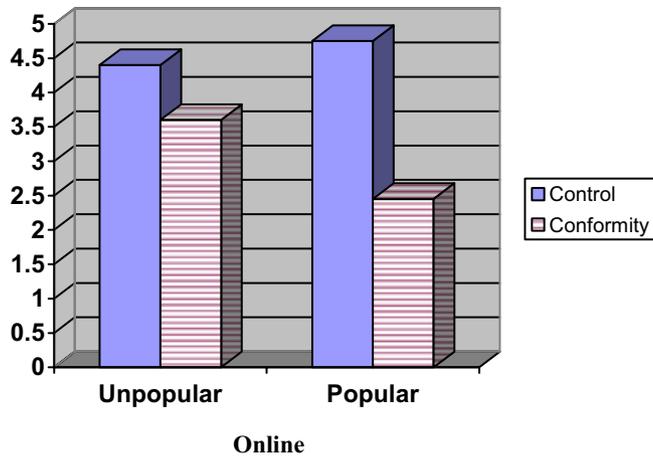
<sup>a</sup>The upper half of the table presents the scores of the pro-alcohol and anti-alcohol conditions in the "online" chat room session. The lower half presents the scores in the "offline" session.

conformity items than on the control items. In the "unpopular" condition, the difference between the conformity and control items was not significant,  $F(1, 17) = 0.64$ ,  $p = 0.437$ , indicating that participants conformed to popular e-confederates, but not to unpopular e-confederates' anti-alcohol norms (see footnote 2).

#### Pro-Alcohol Condition "Offline"

To test whether the participants conformed to the drinking norms of their "peers" to make a good impression, or whether they privately accepted and internalized these norms, we conducted the same analyses for the "offline sessions." The results are presented in the lower half of Table 1. If the participant had internalized the e-confederates' norms, we would find the same effects in this pro-alcohol "offline"

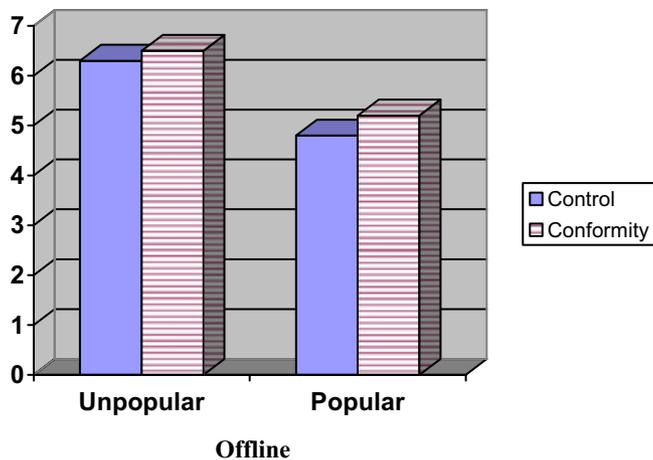
<sup>2</sup>As described before, the manipulation of the experimental condition (social status of the e-confederates) failed for 14 participants, who were therefore excluded from the analyses. However, when including these participants, we found the same significant results.



**Fig. 2.** Scores on conformity and control scenarios (i.e., willingness to drink) in the anti-alcohol/online condition. Values are participants' scores on the alcohol scenarios; lower scores indicate less willingness to drink.

session, as in the pro-alcohol “online” session. To recall, in the “online session,” participants scored higher on the conformity than the control items and this difference was largest in the popular condition.

Repeated-measures ANCOVA showed no interaction effect between item type and the social status of the e-confederates. Two separate ANCOVAs showed an effect of social status on the conformity items,  $F(1, 31) = 6.13, p = 0.019, d = -1.00$  (large effect size), indicating that participants scored higher (more willing to drink alcohol) on the “offline” conformity items in the “unpopular” condition than in the “popular” condition. The same effect of social status was found for the control items,  $F(1, 31) = 14.45, p = 0.001, d = -1.33$  (large effect size). Repeated-measures analyses within each condition showed that the difference between the conformity items and the control items was not significant for both conditions (popular condition:  $F(1, 15) = 2.23, p = 0.156$ ; unpopular condition:  $F(1, 13) = 0.00, p = 0.952$ ). These results indicate that participants gave



**Fig. 3.** Scores on conformity and control scenarios (i.e., willingness to drink) in the pro-alcohol/offline condition. Values are participants' scores on the alcohol scenarios; higher scores indicate more willingness to drink.

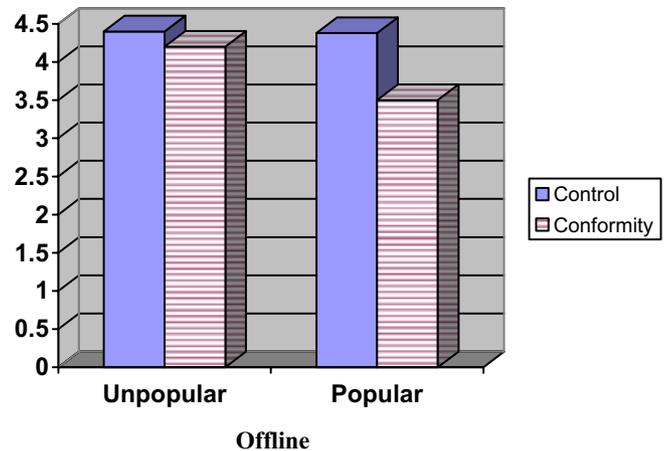
“offline” more positive answers to the hypothetical scenarios when the e-confederates were unpopular than when they were popular, both on conformity and on control items (see footnote 2) (Fig. 3). These findings suggest that although participants conformed to the e-confederates in the “online session,” they had not privately accepted these norms.

*Anti-Alcohol Condition “Offline”*

The same analyses for the “offline session” in the anti-alcohol condition showed a marginally significant interaction effect between item type and the social status of the e-confederates (see lower half Table 1). Two separate ANCOVAs showed a main effect of social status on the conformity items,  $F(1, 37) = 4.30, p = 0.045, d = 0.36$  (small/medium effect size), indicating that participants scored lower (less willing to drink alcohol) on the “offline” conformity items in the “popular” condition than in the “unpopular” condition. No effect of social status was found for the control items,  $F(1, 37) = 0.75, p = 0.391$ . Repeated-measures analyses within each condition showed a significant difference between the conformity and control items in the “popular” condition,  $F(1, 17) = 5.38, p = 0.033, d = 0.26$  (small effect size), which means that participants in the “popular” condition scored lower on the conformity than on the control items. In the “unpopular” condition, the difference between the conformity and control items was not significant (see footnote 2),  $F(1, 17) = 1.14, p = 0.713$  (Fig. 4). Although the effect size in the “offline session” is small (0.26), the direction of these results is similar to the results of the “online session,” which suggests that participants privately accepted and internalized the anti-alcohol norms of the popular e-confederates.

DISCUSSION

Even though it has been suggested that adolescents’ drinking behavior is affected by peer norms, studies that experimentally tested this hypothesis are scarce. Additionally,



**Fig. 4.** Scores on conformity and control scenarios (i.e., willingness to drink) in the anti-alcohol/offline condition. Values are participants' scores on the alcohol scenarios. Lower scores indicate less willingness to drink.

despite the fact that ample research focused on the influence of peers, it is not exactly clear how adolescents are influenced by their peers and which peers are most influential. The present study tested the influence of peer drinking norms on male adolescents' willingness to drink and showed that average popular adolescents conformed their willingness to drink to the pro-alcohol as well as the anti-alcohol norms of peers. However, participants did not conform equally to all peers; they conformed more to popular than to unpopular peers. These findings are consistent with previous research that examined the influence of high-status peer norms on adolescents' willingness to engage in social aggression and health risk behavior (i.e., physical aggression, teasing, vandalism, and substance use) (Cohen and Prinstein, 2006). The results are also in line with the findings from Bot and colleagues (2005) showing higher levels of adolescents' conformity to the drinking of a higher status than a lower status friend. This supports the notion that adolescents' compliance to peer drinking norms may be predominantly motivated by perceived or anticipated social rewards (see Cialdini and Trost, 1998).

Although adolescents were more influenced by popular than unpopular peers, it was remarkable that, overall, the absolute levels of adolescents' willingness to drink were higher when adolescents were confronted with the norms of unpopular compared with popular peers (see Figs 1–4). These results are inconsistent with the findings of Cohen and Prinstein (2006), which showed that adolescents distanced themselves from the aggression and health risk norms of unpopular peers. As willingness to drink is likely to be seen as valued behavior (Engels et al., 2006), participants may tend to outscore the answers of unpopular peers by communicating more willingness to drink. For example, when unpopular peers communicate pro-alcohol norms, adolescents may feel "inferior" if their own willingness to drink is lower than that of these peers. Yet, our findings need to be replicated in future studies and possible explanations for this effect should be further examined.

Additionally, we tested whether participants privately accept and internalize the norms of their peers or whether conformity to their peers reflects impression management. Our results suggest that adolescents mainly conform to the pro-alcohol norms of peers to make a good impression, because they gave different answers in the online condition than in the offline (private) condition. These results are in line with the findings of Corcoran and Segrist (1993) showing that fear of negative evaluation was the most important predictor of beverage selection when others could see which beverage one had selected. At the same time, even though the effect sizes were small, our results also suggest that adolescents do accept and internalize the anti-alcohol norms of popular peers.

Our finding that adolescents internalize the anti-alcohol norms of peers is related to the rationale behind normative education programs. These programs are based on the notion that students overestimate the amount that peers

drink and their comfort with heavy drinking, which is strongly related to their own alcohol use (e.g., Perkins et al., 2005). Correcting these overestimations of the norms of peers by providing a lower drinking norm might lead to a decrease in alcohol use. A few studies indeed indicated that a lowered perceived drinking norm of peers resulted in a drop in alcohol use (Donaldson et al., 1994; Hansen and Graham, 1991). Yet other studies found no effect or even opposite effects of normative education programs (Perkins et al., 2005; Wechsler et al., 2003). These inconsistent results of normative education programs might be partly due to the fact that the norms of some specific peer groups are more important than the norms of others (Dijkstra et al., 2008; see Blanton and Burkley, 2008). The results of our study indicate that adolescents only internalize the anti-alcohol norms of popular peers and not those of unpopular peers. Exposing adolescents to the norms of the total peer group, which is often the case in normative education, might therefore be not (as) effective. This also corresponds with results from peer-led interventions. Peer-led interventions are based on the assumption that interventions aimed at youngsters would be more effective if the health promotion messages are conveyed by peers rather than by adults (Stephenson et al., 2004). Yet, the effects of these peer-led interventions seem to be small (Cuijpers, 2002; Mellanby et al., 2000). Cuijpers (2002) concluded that the effectiveness of a prevention program may be determined by several aspects, such as characteristics of the leader. In line with this assumption, studies that used influential (popular) peers as leaders in peer-led smoking interventions seemed to be more successful (Campbell et al., 2008; Starkey et al., 2009). Moreover, a study by Valente and colleagues (2003) showed that a peer-led tobacco prevention program in schools was most effective if leaders were selected based on peer nominations and groups were formed by allocating students to the leaders they nominated. Our findings suggest that the social status of peers should play an important role in peer-led interventions and in normative education programs, and also more generally, social status should be taken into account when studying peer influence processes.

Despite the strengths of our experimental study, there are some limitations and suggestions for future research that should be mentioned. In spite of the fact that willingness to drink is a strong predictor of actual drinking behavior, especially in adolescence (Gibbons et al., 1998a,b), the present study does not allow definite conclusions about the influence of peer drinking norms on actual drinking behavior. Moreover, no follow-up measures were included in our study. Future studies should examine whether conformation to peer drinking norms relates to adolescents' willingness to drink and actual alcohol use in the long run. Additionally, our study included 3 components, namely the pretest, public conformity (online measure), and private acceptance (offline measure). Yet, with our design, we cannot test whether exposure to the norms of peers can directly result in the private acceptance of peer norms, without the intervening step of public conformity (cf. Cohen and Prinstein, 2006).

Other limitations of our study pertain to the generalizability of our results. The first is that we included only male participants. There are indications that men experience more social pressure to drink than women (Suls and Green, 2003). In line with these findings, a study by Prentice and Miller (1993) showed that when men perceived their alcohol attitudes to deviate from the drinking norm, they adapted their attitudes in line with the norm. Women on the other hand did perceive differences between their own drinking attitudes and the norm, which resulted in alienation, but they did not adapt their attitudes. Although alcohol use may be more important for men than for women, achieving popular status may be important for adolescent girls as well (Eder, 1985). It is therefore interesting to include both sexes in future studies to test whether boys and girls are equally influenced by the drinking norms of popular and unpopular peers.

Second, we only selected students in the 2 highest academic levels of the schools. Some research found no significant differences in the prevalence of adolescent alcohol use according to students' academic level (Monshouwer et al., 2008). However, other studies showed that frequencies of binge drinking are higher among the students with a low education level than among the high educated students (RIVM, 2010). Additionally, the effect of academic level on peer influence susceptibility remains unclear. As far as we know, no studies investigated the relationship between academic level and peer influence. Yet, academic level might be highly correlated with IQ scores (Driessen and Smeets, 2007). Although some research found that resistance to peer influence was positively related to IQ (Steinberg and Monahan, 2007), other research found no differences in IQ between children with high and low resistance to peer influence (Grosbras et al., 2007). Future studies should examine whether academic level moderates the relationship between peer conformity and willingness to drink.

Moreover, in our study, we included participants with an average social status. There are some indications that low-status adolescents may distance themselves from the norms of high-status peers (Eckert, 1989). However, another study showed that adolescents who were ignored and excluded often adapted their behaviors to their peers in order to be included in the group (Carter-Sowell et al., 2008). Again another study showed that peer influence was strongest among the adolescents who were best adjusted and well socialized (Allen and Antonishak, 2008). In line with these findings, Alexander and colleagues (2001) found that popular students adjusted their smoking behavior more to the norms of the school than unpopular peers did. These ambivalent findings indicate that further research is needed to provide more insights into the moderating role of the social status of the individual in peer influence processes.

A final limitation regarding the generalizability of our results is that we only included participants whose perceptions of the popularity of the peers in the chat room matched the norm. Although the results were generally the same with and without the 14 participants whose per-

ceptions did not match the norm, it is possible that peer popularity as perceived by an individual is more important in peer influence processes than peer popularity as perceived by the group.

The present study is one of the first that experimentally examined peer influence on adolescents' willingness to drink, and provided more information about the underlying mechanisms of peer influence. Most importantly, the results indicated that peer influence might not only encourage alcohol use, but also have a preventive effect. Some scholars suggest that the efficiency of alcohol prevention programs may be increased by promoting anti-alcohol norms and behaviors among the popular students (Tucker et al., 2011). The results of our study indicate that popular peers are indeed most influential, and the finding that adolescents internalize the anti-alcohol norms but not the pro-alcohol norms of popular peers is promising and supports the potential of this intervention strategy.

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