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An experimental study on the effects of peer drinking norms on adolescents' drinker prototypes

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Abstract

Background—Adolescents form impressions about the type of peers who drink (i.e., drinker prototypes). The evaluation of, and perceived similarity to these prototypes are related to adolescents' drinking. Peer drinking norms play an important role in the formation of prototypes. We experimentally examined whether manipulation of peer norms changed the evaluation of and perceived similarity to drinker prototypes and whether these changes were moderated by peers' popularity.

Methods—In a pre-test, we assessed heavy drinker, moderate drinker and abstainer prototypes, drinking behaviors and peer-perceived popularity among 599 adolescents. Additionally, 88 boys from this sample participated in a simulated chat room, in which they interacted with peers from school. These peers were in fact pre-programmed e-confederates, who were either popular or unpopular and who communicated either pro-alcohol or anti-alcohol norms. After the chat room interaction we assessed participants' drinker prototypes.

Results—Participants exposed to anti-alcohol norms were more negative about, and perceived themselves as less similar to heavy drinker prototypes, than participants exposed to pro-alcohol norms. We found no effects of peer norms on moderate drinker and abstainer prototypes. Effects were not moderated by peers' popularity. We did find a main effect of popularity on perceived similarity to all prototypes. This indicated that participants rated themselves as more similar to

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Conflict of interest

All authors declare that they have no conflicts of interest.

heavy and moderate drinker prototypes and less similar to abstainer prototypes when they interacted with unpopular peers than with popular peers.

Conclusions—Exposure to anti-alcohol norms of peers leads adolescents to form more negative prototypes of the heavy drinker. This could be an important finding for prevention and intervention programs aimed to reduce alcohol consumption among adolescents.

Keywords

Drinker prototypes; Peer norms; Peer popularity; Adolescents; Peer influence

1. Introduction

Adolescence is characterized by a peak in risk taking behaviors (Steinberg, 2004). Although adolescents engage in considerably more risk taking behaviors than adults, little difference between these age groups is found regarding the perception and evaluation of risks, and the judgments about the consequences of risky behavior (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993; Reyna & Farley, 2006; Steinberg, 2007). Intervention programs that provide information about the risks of certain behaviors, such as substance use, generally increase adolescents' knowledge about these behaviors, but are rarely effective in decreasing adolescents' engagement in these behaviors (Steinberg, 2007). These results indicate that adolescents' increased levels of risk taking behaviors are not due to a lack of knowledge or differences in perceptions about the consequences of risky behaviors. Adolescents have the capacities to make the right decisions about risky behaviors, yet, these decisions largely depend on the situations in which the decisions are made (Crone & Dahl, 2012). In certain situations, for example, when adolescents are accompanied by peers, they are likely to make worse decisions about risks than adults (Chein, Albert, O'Brien, Uckert, & Steinberg, 2011; Gardner & Steinberg, 2005; Reyna & Farley, 2006).

Indeed, according to the Prototype–Willingness model (Gibbons, Gerrard, & Lane, 2003), adolescents' risk behaviors, such as alcohol use, are generally not planned or intended actions but rather reactions to social situations. Behavioral intentions, which are described as conscious decisions ahead of time to engage in behavior, are therefore less strongly related to adolescents' alcohol use (Gibbons et al., 2003). Although adolescents might not intend to drink alcohol, they encounter situations, such as a party with their friends, in which they have the opportunity to drink and may respond to these situations by drinking without premeditation. Adolescents usually acknowledge that they would be willing to drink alcohol in these situations, even if they have no intentions to drink. Willingness is, therefore, defined as an individual's acknowledgment that, under some circumstances, he or she might engage in the behavior, and is considered to be a better predictor of adolescents' alcohol consumption than adolescents' intentions to drink (Gibbons et al., 2003).

Alcohol consumption typically occurs at social and public occasions (Knibbe, Oostveen, & Van de Goor, 1991). During adolescence, young people start going out and have social gatherings with their peers. Some may go to public drinking places, such as bars or clubs, others may go to home parties or social events where alcohol is consumed (Verdurmen et al., 2012). Either way, adolescents rarely drink alone but predominantly in the company of

peers. As a consequence, adolescents may form impressions about the type of adolescents who drink and about how drinking is perceived by the peer group. These stereotypical perceptions of drinkers are also referred to as drinker prototypes (Gerrard et al., 2002; Gibbons & Gerrard, 1995). Drinker prototypes can range from positive to negative. For example, the typical peer who drinks may be perceived as amiable and sociable or as annoying and irresponsible, while the typical abstainer may be perceived as boring and unsociable or as responsible and determined (Van Lettow, Vermunt, De Vries, Burdorf, & Van Empelen, 2012). Previous research indicated that risk images, such as heavy drinker prototypes, are overall rather negative (Gerrard et al., 2002; Gibbons et al., 2003).

By engaging in drinking behavior, adolescents may believe that they acquire some of the characteristics associated with the drinker prototype. Adolescents can therefore perceive drinker prototypes as social consequences of drinking. Since adolescence is characterized as a developmental period in which social consequences are highly important, drinker prototypes may influence adolescents' drinking behaviors substantially. Longitudinal research shows that relatively favorable drinker prototypes predicted increased willingness and intentions to drink, and increased alcohol consumption among adolescents (Andrews, Hampson, Barckley, Gerrard, & Gibbons, 2008; Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Gerrard et al., 2002; Spijkerman, Van den Eijnden, Overbeek, & Engels, 2007).

A key assumption of the Prototype–Willingness model is that prototypes influence willingness and behavior via social comparison processes. Adolescents compare drinker prototypes to their self-image. The more similar adolescents think they are to a prototype, the more likely they are to engage in the behavior associated with that prototype (Gibbons et al., 2003; Rivis & Sheeran, 2003; Rivis, Sheeran, & Armitage, 2006). Previous studies on alcohol use showed that perceived similarity to abstainer prototypes was cross-sectionally related to willingness to drink, while similarity to drinker prototypes was related to intentions (Zimmermann & Sieverding, 2010). Lane, Gibbons, O'Hara, and Gerrard (2011) showed in an experimental study that young adults' willingness to drink decreased when they perceived themselves as dissimilar to the drinker prototype, but only when they were encouraged to compare themselves with these types of drinkers. Moreover, Norman, Armitage, and Quigley (2007) found that perceived similarity to binge drinker prototypes was cross-sectionally related to young adults' intentions to engage in binge drinking and predicted self-reported binge drinking at one week follow-up.

Given the findings that drinker prototypes are related to adolescents' alcohol use, drinker prototypes may be relevant targets in prevention and intervention programs. However, little is known about whether and how drinker prototypes can be changed. Peers may play an important role in this process. Peers can have direct (active) or indirect (passive) influences on adolescents' drinking behavior. Direct influence refers to explicit offers from peers to consume alcohol, while indirect influence refers to modeling (i.e., adolescents' drinking behavior resembles that of their peers) and social norms (Borsari & Carey, 2001; Graham, Marks, & Hansen, 1991). Peer drinking norms are defined as adolescents' perceptions of the quantity and frequency of peers' drinking behavior, and approval of drinking (Borsari & Carey, 2001). Peer norms can have direct effects on drinking behavior, yet they can also

affect drinking behavior via alcohol related cognitions (Borsari & Carey, 2001, 2006; Maisto, Carey, & Bradizza, 1999).

According to the Prototype–Willingness model, there is an important link between peers' behaviors (i.e., peer norms) and prototypes (Gibbons et al., 2003). This link suggests that peer norms may play a key role in the formation of prototypes. This assumption is in line with longitudinal research showing that affiliation with drinking peers and higher perceived drinking norms of friends are related to the development of more favorable drinker prototypes (Blanton et al., 1997; Gerrard, Gibbons, Zhao, Russell, & Reis-Bergan, 1999; Ouellette, Gerrard, Gibbons, & Reis-Bergan, 1999). If adolescents think alcohol use is a common behavior among their peers and if they admire their peers, their perceptions of the typical peer who drinks may be more positive and they may perceive themselves to be more similar to this type of peer than adolescents who think that alcohol use is an unusual behavior among their peers.

Although peer norms seem to be an important predictor for the formation of drinker prototypes, experimental studies that focused on the causal relationship between peer drinking norms and drinker prototypes are scarce. As a consequence, little is known about whether changing peer drinking norms may actually lead to changes in drinker prototypes. During adolescence, peer drinking norms are likely to change due to, for example, changes in peer groups or maturation. It is yet unknown whether these changes in peer drinking norms will lead to changes in drinker prototypes or whether drinker prototypes are relatively stable once formed. To our knowledge, only one study tested whether manipulating peer drinking norms affected adolescents' drinker prototype favorability and similarity. Litt and Stock (2011) randomly assigned 13 to 15 year old adolescents to one of two Facebook conditions, which were used to manipulate the peer drinking norm. Participants were asked to look at the Facebook profiles of four high school students for 40 min. In the alcohol condition, three profiles showed pictures of a student drinking alcohol; in the control condition the same students were displayed but only one profile showed pictures of a student drinking alcohol. The comments of the "friends" on the Facebook page also referred to past or future alcohol use in the alcohol condition, and to social activities in the control condition. The results showed that adolescents in the alcohol condition reported more favorable drinker prototypes after the Facebook manipulation than adolescents in the control condition. These findings suggest that changing perceived peer drinking norms may be a promising method to change adolescents' evaluations of drinker prototypes.

During adolescence, social status is highly valued and perceived popular peers are found to be especially salient (Cillessen & Rose, 2005; Prinstein, Meade, & Cohen, 2003). Popular peers are generally admired and, therefore, their behavior and norms can be influential to others (Cillessen & Rose, 2005; Cohen & Prinstein, 2006; Prinstein & Cillessen, 2003; Teunissen, Spijkerman, Prinstein et al., 2012). This is underpinned by the Social Learning Theory, which states that people engage in behavior by observing the behaviors of others, and that individuals with high social status are more likely to be modeled than individuals with low social status. The underlying assumption is that behavior of individuals with high social status is more likely to be successful and therefore to be more rewarding than behavior of low status individuals (Bandura, 1977). However, unpopular peers may be

influential as well in that adolescents may change their behavior in order to differentiate themselves from these unpopular peers. A study by Cohen and Prinstein (2006) showed that adolescents conformed to the norms of popular peers, while they distanced themselves from the norms of unpopular peers. When unpopular peers indicated that they would be willing to engage in certain behaviors, participants indicated that they would not be willing to engage in these behaviors. This is in agreement with previous research suggesting that adolescents may adapt their behavior to prevent being associated with a group that represents an undesirable social image (Fordham & Ogbu, 1986). Yet, to our knowledge, there are no studies that examined whether the influence of peer norms on adolescent prototypes depends on the type of peers that convey these norms. In the present study, we therefore examined whether exposure to the drinking norms of popular or unpopular peers can change adolescents' drinker prototypes.

Additionally, most of the research on drinker prototypes focused on risk images, such as the image of the typical (heavy) drinker, but not on non-risk or healthy images (Gibbons et al., 2003). Research showed that adolescents also have clear images of the type of peer who abstains from risk taking behavior. Some cross-sectional and longitudinal studies suggest that positive abstainer prototypes are related to lower willingness and intentions to drink, and lower self-reported alcohol consumption (Gerrard et al., 2002; Zimmermann & Sieverding, 2010, 2011). However, Spijkerman, Larsen, Gibbons, and Engels (2010) examined the impact of abstainer, social drinker and heavy drinker prototypes on college students' alcohol consumption in a naturalistic environment (i.e., a barlab) with their friends. Although abstainer and heavy drinker prototypes were related to students' self-reported alcohol use, only heavy drinker prototypes were related to observed alcohol consumption when drinking behavior of the group was taken into account. This suggests that heavy drinker prototypes may have a stronger effect on actual drinking behavior than moderate drinker or abstainer prototypes. In the present study, we experimentally examined whether peer drinking norms can change adolescents' heavy drinker, moderate drinker and abstainer prototype evaluation and similarity.

To summarize, the present study adds three elements to previous research; a) it is one of the first that experimentally examines whether peer norms can change adolescents' evaluation of and similarity to drinker prototypes; b) it includes not only risk prototypes, but also non-risk prototypes (i.e., heavy drinker, moderate drinker, and abstainer prototypes), and c) it tests whether the social status of the peers is an important moderator of the effects of peer norms on drinker prototypes. We expected that pro-alcohol drinking norms of peers would lead to more positive perceptions of and similarity to the type of peer who drinks heavily and moderately, and to more negative perceptions of and dissimilarity to the type of peer who abstains from drinking. We also expected to find the reversed effects from anti-alcohol drinking norms of peers: more negative perceptions of and dissimilarity to the type of peer who drinks heavily and moderately, and more positive perceptions of and similarity to the type of peer who abstains from drinking. However, we expected to find these effects only if the drinking norms were conveyed by popular peers. If the drinking norms were conveyed by unpopular peers, we expected to find no or even opposite effects on drinker prototypes.

To answer these research questions, we used an experimental design in which adolescents participated in a simulated Internet chat room. To manipulate the peer drinking norms, participants were led to believe that they were interacting with three peers from their school in this chat room. These "peers" communicated either pro-alcohol or anti-alcohol norms and they were either popular or unpopular. Previous research indicated that the chat room is a valid and useful method to manipulate peer norms (Cohen & Prinstein, 2006; Prinstein, Brechwald, & Cohen, 2011; Teunissen, Spijkerman, Prinstein et al., 2012).

2. Method

2.1. Participants

The present study included two parts. In the first part (pretest), participants completed a pretest questionnaire while they were in their classroom and in the second part they participated in a chat room experiment. In total, 599 adolescents (48.6% boys) of three high schools in The Netherlands participated in the pretest (part 1). Participants were on average 17 years old (*SD* = 0.82). The legal drinking age in The Netherlands is 16 years. The majority (95%) was born in The Netherlands and 89.1% had ever drunk alcohol. Data were collected in 28 classes: 11 fourth-grade (=10th grade in the US) and 17 fifth-grade (=11th grade in the US) classes of pre-university and higher general secondary education.

For the second part of the study, the chat room experiment, we selected 88 participants from the pretest, based on the following selection criteria: (1) being male, (2) having an average social status, and (3) having ever drunk alcohol before. The reason we included only boys was that studies suggested that drinker prototypes and drinking norms have a stronger effect on men's drinking behavior than on women (Chassin, Tetzloff, & Hershey, 1985; Gibbons & Gerrard, 1995; Prentice & Miller, 1993; Suls & Green, 2003; Teunissen, Spijkerman, Larsen et al., 2012). Additionally, boys between 15 and 18 years old who drink are found to consume more and to have higher frequencies of alcohol consumption, binge drinking and drinking to intoxication than girls (Verdurmen et al., 2012). We chose to include only participants with an average social status since we expected that the effect of peer social status could best be captured in a 'neutral' status group (Cohen & Prinstein, 2006; Teunissen, Spijkerman, Prinstein et al., 2012). For ethical reasons, we included only participants who had drunk alcohol before.

2.2. Procedure

The study was approved by the Ethical Committee of the Faculty of Social Sciences from the Radboud University Nijmegen. We recruited middle sized schools, with three to five classes within each grade and educational level, to participate in the pre-test. Large schools were not included because it was a prerequisite for the sociometric assessment and the chat room experiment that participants would be acquainted with each other, as described later. The three participating schools provided a list with the names of all students in each class, which resulted in a total number of 725 students. Parents received a letter with information about the study and gave passive consent for their child's participation. Due to changes in the students' timetables, absence of students on the day of testing, and parents who did not approve of participation, data from 126 students were missing, resulting in a final sample of

599 adolescents who were included in the first part (pretest) of the study. In that part, we assessed students' evaluations of and similarity to drinker prototypes, drinking behavior and willingness to drink. In addition, students' social status and friendship affiliations were assessed by using sociometric methods.

The second part of the study, the chat room experiment, was scheduled between four and fourteen weeks after the pre-test. In total, 152 students met the selection criteria (i.e., male, average social status, ever drunk alcohol). We defined average social status as having standardized peer-perceived popularity scores between −1.0 and +1.0 (see below) (Cohen & Prinstein, 2006). Due to lack of time, 49 students of fifth-grade higher general secondary education were not able to participate. This resulted in 103 students that were invited to participate in the chat room experiment. The data of four participants were removed because they expressed doubts about interacting with real peers in the chat room (n = 99). Six participants were excluded because they were absent on the day of testing (n = 93) and five participants were excluded due to technical problems. The final sample in the chat room thus consisted of 88 adolescents.

The chat room experiment used a 2 (popular vs. unpopular peers) × 2 (pro-alcohol vs. anti-alcohol norms) between subjects design. Participants were randomly assigned to one of four conditions, which implies that participants were interacting with "peers" who were either popular or unpopular, and these peers communicated either pro-alcohol or anti-alcohol norms.

2.3. Materials

2.3.1. Popularity and friendship affiliations—We used sociometric assessments to examine adolescents' peer-perceived popularity and their friendship affiliations. Participants received an alphabetized list containing the names of all students within their grade and education level. All names on the list were numbered and participants were asked to indicate the numbers associated with the peers they thought were most popular and the peers who were least popular.[1] For each question, participants could nominate as many peers as they liked, with a maximum of 24; self-nominations were not allowed. For each adolescent, the total number of received nominations on most popular and least popular were computed and standardized within grade to account for differences in grade size. Scores on 'most popular' ranged between −0.78 and 4.27 and scores on 'least popular' ranged between −0.65 and 5.80. We computed a difference score between the standardized number of nominations on most popular and the standardized number of nominations on least popular. Adolescents who scored between −1.0 and +1.0 were selected for participation. Higher scores indicate higher perceived popularity (Parkhurst & Hopmeyer, 1998).

Additionally, we asked participants to fill out the numbers of the peers whom they considered to be their best friends. Again they could nominate up to 24 peers. These friendship nominations were used to identify the best friends of the most popular and least

[1]Participants were merely asked to nominate popular and unpopular peers, without indicating what makes these peers popular. Previous research among Dutch adolescents revealed that perceived popularity is associated with dressing hip, attractiveness, not being boring, aggression and social preference, which shows strong similarities with perceptions of popularity in North-American cultures (De Bruyn & Cillessen, 2006; De Bruyn & van den Boom, 2005).

popular peers, whose names were used in the chat room as a manipulation of the social status of the e-confederates (described below).

2.3.2. Drinking behavior—We asked the adolescents to indicate whether they had ever drunk alcohol before. If they had, we assessed their drinking frequency in the past four weeks. Answers could be given on a six-point scale (1 = *no alcohol*, 2 = *1 to 3 days in four weeks*, 3 = *1 to 2 days a week*, 4 = *3 to 4 days a week*, 5 = *5 to 6 days a week*, 6 = *every day*) (Engels & Knibbe, 2000). Additionally, participants were asked how often they drank five or more alcoholic drinks during one occasion in the past four weeks (i.e., binge drinking: 0 = *never*, 1 = *one time*, 2 = *two times*, 3 = *three or four times*, 4 = *five or six times*, 5 = *seven or eight times*, 6 = *nine times or more*) (Mares, van der Vorst, Engels, & Lichtwarck-Aschoff, 2011). Moreover, participants indicated how many alcoholic drinks they consumed during weekdays and weekends in the past week, both at home and at other places. We summed the scores on these four measures to compute the total number of glasses consumed in the past week (Engels, Knibbe, & Drop, 1999).

2.3.3. Drinker prototypes—Drinker prototypes consisted of two constructs: prototype evaluation and prototype similarity (Norman et al., 2007; Rivis & Sheeran, 2003). We presented a definition of a prototype to participants, translated from Gibbons, Gerrard, and Boney-McCoy (1995, p. 87): “The following questions concern your images of people. What we are interested in here are your ideas about typical members of different groups. For example, we all have ideas about what typical movie stars are like or what the typical grandmother is like. When asked, we could describe one of these images—we might say that the typical movie star is pretty or rich, or that the typical grandmother is sweet and frail. We are not saying that all movie stars or all grandmothers are exactly alike, but rather that many of them share certain characteristics”. In our study, we were interested in participants’ ideas about heavy drinkers, moderate drinkers and abstainers. First, participants were instructed to think about the type of peer that never (or barely) drinks and we asked them to indicate how positively they evaluated this type of peer (i.e., *prototype evaluation*). They could give their answer on a five-point scale, ranging from 1 = *not positive at all* to 5 = *very positive*. Additionally, we asked them to indicate how similar they were to this type of peer (i.e., *prototype similarity*). Again, they could give their answer on a five-point scale, ranging from *not at all* to *very*. We asked these same two questions about peers who drink moderately and peers who drink heavily. To get an idea of participants’ definition of moderate and heavy drinkers, we assessed participants’ estimations of the number of glasses that moderate and heavy drinkers consume during each occasion. We measured drinker prototype evaluation and similarity two times in this study, first during the pretest and a second time after the chat room experiment.

2.3.4. Willingness to drink—We assessed participants’ willingness to drink with 12 hypothetical drinking scenarios (Teunissen, Spijkerman, Prinstein et al., 2012). An example of a scenario is: “It’s Friday night and you are with your friends in a bar. They are all drinking alcohol, but you actually don’t really feel like drinking alcohol. One of your friends asks whether you like an alcoholic drink as well. What would you do?” They could answer on a 10-point scale how willing they would be to take the drink (0 = *I would definitively not*

take the drink; 9 = *I would definitively take the drink*). Cronbach's alpha of these 12 scenarios was 0.93. Additionally, we included 5 filler items on other types of behavior, such as deviant behavior and risk taking. Participants completed this questionnaire twice; first in the pretest and a second time in the chat room experiment. In the chat room experiment, we used this scale to manipulate the drinking norms of peers.

2.3.5. Chat room experiment—The 88 selected male adolescents were asked to participate in the chat room experiment. A more detailed description of the chat room is presented in Cohen and Prinstein (2006) and Teunissen, Spijkerman, Prinstein et al. (2012). Participants were tested individually in a private room at their school and were led to believe that three other students from their school were participating at the same time. However, these other students were not real students, but electronic confederates ('e-confederates') that in fact gave answers that were pre-programmed by us. We told participants that the goal of our study was to examine how adolescents communicate with each other over the Internet and we asked them to respond to several questions. The participant was always the last one to respond, to ascertain that he was exposed to the answers of the e-confederates first. Depending on the condition, all three e-confederates were either popular or unpopular. We selected these e-confederates based on the sociometric assessment: popular e-confederates received popularity scores higher than +1.0 and unpopular e-confederates received scores lower than −1.0. Consistent with past research (Cohen & Prinstein, 2006; Teunissen, Spijkerman, Prinstein et al., 2012), we excluded the names from these e-confederates in the chat room (for student privacy purposes), but we manipulated their ostensible popularity by showing the first names and last initials of the three best friends of each e-confederate on the computer screen. In the 'popular condition' we showed the names of three popular best friends, based on the sociometric nominations, and in the 'unpopular condition' we showed the names of three unpopular best friends. We strengthened the manipulation of popularity by showing two favorite hobbies of the e-confederates. In the popular condition we presented hobbies that are assumed to be characteristic of popular peers, such as 'going out'; in the unpopular condition we presented hobbies characteristic of unpopular peers, such as 'reading'. The participants were also asked to share the names of their best friends and their hobbies, and we told them that they could use this information to become familiar with the other chat room participants. To ensure that participants would pay attention to the other participants, we informed them that they would be asked questions about the other participants at the end of the chat room.

Subsequently, we asked participants in the chat room to respond to the same hypothetical scenarios as in the pretest, to assess their willingness to drink. Participants gave their answer to each scenario after they had seen the answers of each of the three e-confederates. We used the answers of the e-confederates to manipulate the peer drinking norm. The answers of the e-confederates were based on the scores on the pre-test. On nine of the twelve drinking scenarios, the e-confederates gave answers that were about 1 *SD* above the pretest mean score for that scenario (in the pro-alcohol condition) or 1 *SD* below the pretest mean score for that scenario (in the anti-alcohol condition). In other words, in the pro-alcohol condition, participants interacted with e-confederates that were more willing to drink than the average grade mate (i.e., pro-alcohol norm) and in the anti-alcohol condition, participants interacted

with e-confederates that were less willing to drink than the average grade mate (i.e., anti-alcohol norm). On the remaining three drinking scenarios as well as on the five filler scenarios, the e-confederates gave average responses, equal to the pretest mean score on that scenario.[2] After the chat room interaction, we assessed participants' evaluations of and similarity to the drinker prototypes. At the end of the chat room experiment, we asked participants to rate how popular they thought each of the three e-confederates were. Answers could be given on a five-point scale, ranging from 1 (*not popular at all*) to 5 (*very popular*). We used this measure as a manipulation check.

After data collection at a school was completed, the participants of that school were debriefed via email. The design and cover story of the experiment were explained in this email, as well as the fact that the other participants in the chat room were not real peers, but pre-programmed answers. The email also contained an email address and a telephone number of one of the researchers that participants could use if they had any questions or remarks.

2.4. Analyses

We conducted three MANCOVA's to test the effects of pro-alcohol and anti-alcohol norms of popular and unpopular peers on prototype evaluation and similarity. We controlled for participants' prototype scores in the pretest and we conducted separate analyses for heavy drinker, moderate drinker and abstainer prototypes.

3. Results

There were no differences between the conditions in terms of participants' frequency of drinking (F[3,87] = 0.44, p = .728), frequency of binge drinking (F[3,87] = 0.21, p = .889), consumed number of glasses last week (F[3,87] = 0.50, p = .686), evaluations of heavy drinker (F [3,85] = 1.68, p = .177), moderate drinker (F[3,87] = 1.38, p = .255), and abstainer prototypes (F[3,87] = 0.36, p = .782), and perceived similarity to heavy drinker (F[3,85] = 0.80, p = .500), moderate drinker (F [3,87] = 0.50, p = .444), and abstainer prototypes (F[3,86] = 0.55, p = .652) in the pre-test. Descriptive statistics are shown in Table 1. Means and standard deviations are presented for participants who completed both the pre-test and took part in the chat room experiment (n = 88). To have an idea about participants' definitions of moderate and heavy drinkers, we computed average scores of their estimations of the number of glasses that moderate and heavy drinkers consume during each occasion. Participants think that moderate drinkers consume about four glasses per occasion (M = 3, 94, SD = 1, 62), while heavy drinkers are thought to consume about ten glasses during each occasion (M = 10, 41, SD = 4, 21). The correlations between drinker prototypes and drinking behavior are shown in Table 2. Heavy drinker similarity was positively correlated with all three drinking measures and abstainer evaluation and similarity

[2]After the participants interacted with the e-confederates, they answered the same hypothetical drinking scenarios again, but this time the norms of the e-confederates were no longer visible to them and participants believed they were completing the same items in private. This element of the chat room was used to test whether the participants had accepted and internalized the drinking norms of the e-confederates. However, a more detailed examination of this part of the chat room is beyond the scope of this study.

were negatively correlated with these drinking measures. Moderate drinker similarity was only positively correlated with drinking frequency in the past four weeks.

To check whether our popularity manipulation in the chat room was successful, we tested whether participants perceived the popular e-confederates indeed as more popular than the unpopular e-confederates. We computed a mean score for the popularity of the e-confederates and found that e-confederates in the popular condition ($M = 3.75$, $SD = 0.46$) were rated as more popular than the e-confederates in the unpopular condition ($M = 2.35$, $SD = 0.63$; $t\,[86] = 11.95$, $p < 0.001$).

3.1. Willingness to drink

Before we tested whether the chat room interaction changed participants' drinker prototypes, we first focused on participants' willingness to drink in the chat room, to test whether participants conformed to the norms of the e-confederates. ANCOVA analyses revealed a significant interaction effect between peer norms and peer popularity ($F[1,83] = 11.90$, $p = .001$, partial $\eta^2 = .13$). Participants were less willing to drink when they were exposed to anti-alcohol norms of both popular and unpopular peers than when they were exposed to pro-alcohol norms, but the difference between these two conditions was substantially stronger when the norms were communicated by popular peers. Participants were less willing to drink when the anti-alcohol norms were communicated by popular peers than by unpopular peers ($F[1,39] = 15.38$, $p < .001$, $d = 1.22$). No differences were found in the pro-alcohol condition.[3] These results indicate that participants conform their willingness to drink to the alcohol norms of the e-confederates. The effect of popular e-confederates seems to be stronger in the anti-alcohol condition.

3.2. Heavy drinker prototype

We conducted three MANCOVA's to test the effect of the chat room interaction on heavy drinker prototype evaluation and similarity, moderate drinker prototype evaluation and similarity, and abstainer prototype evaluation and similarity. In the first analyses, we included the evaluation of and similarity to heavy drinker prototypes as dependent variables, and norms of the peers in the chat room (condition: pro-alcohol vs. anti-alcohol norms) and the social status of the peers (condition: popular vs. unpopular) as the independent variables. We included the scores on heavy drinker prototype evaluation and similarity in the pretest as covariates. The results showed a significant main effect of the peer norms condition (pro-alcohol vs. anti-alcohol) ($F[2,77] = 3.96$, $p = .023$, partial $\eta^2 = .09$). Univariate tests indicated that participants were more positive about heavy drinker prototypes ($F[1,78] = 6.58$, $p = .012$, partial $\eta^2 = .08$; see Fig. 1) and that they perceived themselves as more similar to heavy drinker prototypes ($F[1,78] = 4.20$, $p = .044$, partial $\eta^2 = .05$; see Fig. 2), after they interacted with peers who communicated pro-alcohol norms compared to anti-alcohol norms, regardless of the popularity of the peers (see Table 3).

[3]These results on the effects of peer norms and peer popularity on willingness to drink are more extensively discussed in a forthcoming dissertation (Teunissen, 2013).

Additionally, this analysis revealed a significant main effect of peer status (F[2,77] = 3.29, p = .043, partial η^2 = .08). Univariate tests revealed that participants thought they were more similar to heavy drinker prototypes after they interacted with unpopular peers in the chat room, than after they interacted with popular peers (F[1,78] = 5.29, p = .024, partial η^2 = .06; see Fig. 2). The effect of peer status on the evaluation of heavy drinker prototypes was not significant. The interaction between peer norms and peer popularity was also not significant (see Table 3).

3.3. Moderate drinker prototype

We conducted the same analyses for the moderate drinker prototypes. We entered the evaluation of and similarity to moderate drinker prototypes as dependent variables, the chat room conditions (pro-alcohol vs. anti-alcohol norms and popular vs. unpopular peers) as independent variables and controlled for moderate drinker prototype evaluation and similarity scores in the pretest. No significant main effect was found for the peer norms condition (pro-alcohol vs. anti-alcohol). Yet, the main effect of the popularity of the peers was significant (F[2,81] = 3.34, p = .040, partial η^2 = .08). Univariate tests indicated that participants rated themselves as more similar to moderate drinker prototypes after they interacted with unpopular peers in the chat room compared to popular peers, regardless of the norms of these peers (F[1,82] = 6.14, p = .015, partial η^2 = .07; see Fig. 3). The effect of peer popularity on evaluation of moderate drinker prototypes was neither significant, nor was the interaction between peer norms and peer popularity (see Table 3).

3.4. Abstainer prototype

We included abstainer prototype evaluation and similarity as dependent variables and entered the chat room conditions as the independent variables. We included the scores on abstainer prototype evaluation and similarity in the pretest as covariates. Results revealed no effect of the peer norms condition, and again a significant main effect of the popularity of the peers (F[2,80] = 3.13, p = .049, partial η^2 = .07). Univariate tests showed that participants rated themselves as more similar to abstainer prototypes after they interacted with popular peers than with unpopular peers (F[1,81] = 6.30, p = .014, partial η^2 = .07; see Fig. 4). We found no effects of peer popularity on evaluation of abstainer prototypes and no interaction between peer norms and peer popularity (see Table 3).

4. Discussion

In the present study, we examined whether peer norms can change male adolescents' evaluations of and similarity to drinker prototypes. Participants interacted with either popular or unpopular peers who communicated pro-alcohol or anti-alcohol norms. The results revealed that participants who were exposed to peers' anti-alcohol norms were more negative about the type of peer who drinks heavily than participants who were exposed to pro-alcohol norms. This effect was not moderated by the social status of the peers. These results are in line with Litt and Stock (2011), who showed that adolescents reported more favorable drinker prototypes after they perceived alcohol use as normative behavior on Facebook profiles, compared to adolescents who viewed neutral Facebook profiles. Additionally, the present study showed that participants exposed to the anti-alcohol norms of

peers perceived themselves as less similar to the type of peer who drinks heavily than participants exposed to the pro-alcohol norms.

Spijkerman et al. (2010) found that only heavy drinker prototypes, but not abstainer or social drinker prototypes, were related to college students' observed alcohol consumption in a naturalistic environment when drinking behavior of their friends was taken into account. Additionally, some experimental studies have investigated the effect of risk images and non-risk images on other types of behavior than substance use. Blanton et al. (2001) studied the effect of positive and negative evaluations of the type of people who do and who do not use condoms on college students' willingness to engage in unsafe sex. They found that negative evaluations of people who do not use condoms predicted willingness to have unsafe sex, while positive evaluations of people who do use condoms had no effect on willingness to engage in unsafe sex. These findings may suggest that prototypes of peers engaging in negative health behavior are stronger predictors of future behavior than prototypes of peers engaging in positive health behavior. Our finding that peer norms can change prototypes of peers engaging in negative health behavior, namely heavy drinking, may therefore be a useful insight for the development of preventive interventions to reduce alcohol use among adolescents.

A possible explanation for the fact that we found no effects of peer norms on evaluations of the moderate drinker and abstainer prototypes could be that abstaining from drinking or drinking moderately is more normative behavior among these adolescents than drinking heavily. Participants' perceptions about moderate drinkers were that they consume about four drinks during each occasion, while they believed that heavy drinkers consume about ten drinks. This suggests that participants perceive the drinking norm of heavy drinkers to be considerably higher than their own levels of alcohol consumption (i.e., about five drinks in the last week; drinking frequency one to three days in the past four weeks). Research indicates that impression formation is influenced by more extreme behaviors (Skowronski & Carlston, 1989).Gibbons et al. (2003), therefore, argue that more extreme behaviors will lead to more vivid and salient prototypes of the people who engage in that behavior, compared to more common behavior. It could be that abstaining and drinking moderately is so common in this age group that it is less salient than drinking heavily. Drinking heavily may be regarded as more extreme behavior in this group. If the peer group norm is to abstain or to drink moderately, the evaluations of the types of peers who engage in abstaining or drinking moderately are based on a large group. If this is the case, exposure to the norms of three peers in the chat room might not change the evaluation of the types of peers who abstain or drink moderately. To our knowledge there are no studies that experimentally examined the effect of peer norms on non-risk images, so future research is warranted to replicate these findings.

Additionally, our results revealed unexpected main effects of peer popularity on similarity to drinker prototypes, indicating that interacting with popular or unpopular peers affected participants' perceived prototype similarity, regardless of the alcohol norms of the peers. These results suggest that participants perceived themselves as less similar to the abstainer prototype and more similar to the moderate and heavy drinker prototype after they interacted with unpopular peers than with popular peers. A possible explanation for our findings could

be that unpopular peers are associated with abstaining, while popular peers are associated with drinking. Indeed, previous research showed a positive correlation between popularity and alcohol use among adolescents of comparable age (Engels, Scholte, van Lieshout, de Kemp, & Overbeek, 2006; Mayeux, Sandstrom, & Cillessen, 2008). A more detailed examination of our pretest data also revealed that the best friends of the e-confederates in the popular condition, whose names were shown in the chat room, scored significantly higher on self-reported alcohol consumption than the best friends of the e-confederates in the unpopular condition. It could therefore be possible that participants associated the unpopular e-confederates with less drinking than the popular e-confederates. As social status is highly important during adolescence, participants may try to avoid being similar to unpopular peers (Cohen & Prinstein, 2006). Moreover, the best friends of the e-confederates were sometimes also nominated as friends by participants and if so, this was more often the case in the popular than in the unpopular condition. This is consistent with the fact that popular peers have higher social preference than unpopular peers (De Bruyn & van den Boom, 2005). This could suggest that participants may have been more able to identify themselves with or feel similar to e-confederates in the popular condition than in the unpopular condition. As a result of the associations between alcohol use and popularity and the perceived or desired similarity to popular peers, participants may have differentiated themselves in this study from unpopular peers by rating themselves as less similar to the type of peer that abstains and more similar to the type of peer that drinks. Unfortunately, we were not able to test this theory, so this explanation is tentative. The fact that the popularity of the e-confederates in this study was related to their alcohol use makes it difficult to examine the sole effect of popularity on drinker prototypes. Future studies should select popular and unpopular e-confederates with equal levels of alcohol use, to test whether similar effects of popularity on drinker prototypes are found.

As indicated before, the results of this study may be useful for preventive interventions to reduce alcohol use among adolescents. The results indicate that exposure to peer norms changes adolescents' heavy drinker prototypes. Future studies should examine whether exposure to peers' anti-alcohol norms is an effective method to actually decrease the favorability of and perceived similarity to heavy drinker prototypes. If so, adolescents with relatively favorable heavy drinker prototypes, who are at risk for problematic drinking patterns, may be selected for these interventions. As drinker prototypes at early age are found to contribute to the prediction of alcohol use during adolescence (Andrews et al., 2008), these interventions may be implemented in early adolescence, to prevent these drinker prototypes to contribute to heavy drinking patterns in middle and late adolescence. Additionally, future research should reveal whether peer popularity can increase the effectiveness of these interventions.

This study has some limitations that should be discussed. As a first step, we focused on the effect of peer norms on drinker prototypes in young males with average social status, attending high education levels. Future studies should include females, both high and low status participants and all education levels, to test whether similar effects of peer norms and peer popularity on drinker prototypes are found.

Additionally, since we used an interactive chat room program, our manipulation included more than mere exposure to peer norms. After participants were exposed to the drinking norms of the e-confederates, they indicated their own willingness to drink on the hypothetical scenarios. It was not possible to test whether the same results would be found without participants indicating their willingness to drink. Unfortunately, we were also unable to examine whether a change in willingness to drink mediated the effects of peer norms on drinker prototypes, since the influence of peer norms on participants' willingness to drink depended on the condition they were assigned to (i.e., pro-alcohol vs. anti-alcohol norms/popular vs. unpopular peers).

5. Conclusions

The present study is the first that experimentally examined the effect of peer norms and peer popularity on adolescents' evaluations of and perceived similarity to drinker prototypes. Our finding that a brief chat room intervention, in which adolescents are exposed to the alcohol norms of peers, could change the evaluation of and perceived similarity to heavy drinker prototypes may be a valuable finding for intervention and prevention programs. Additionally, the finding that peer popularity affects perceived similarity to drinker prototypes is an interesting finding that warrants further examination.

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HIGHLIGHTS

- Exposure to norms of popular and unpopular peers changed adolescent drinker prototypes.
- Peer norms influenced the evaluation of and similarity to heavy drinker prototypes.
- Peer popularity affected perceived similarity to all drinker prototypes.

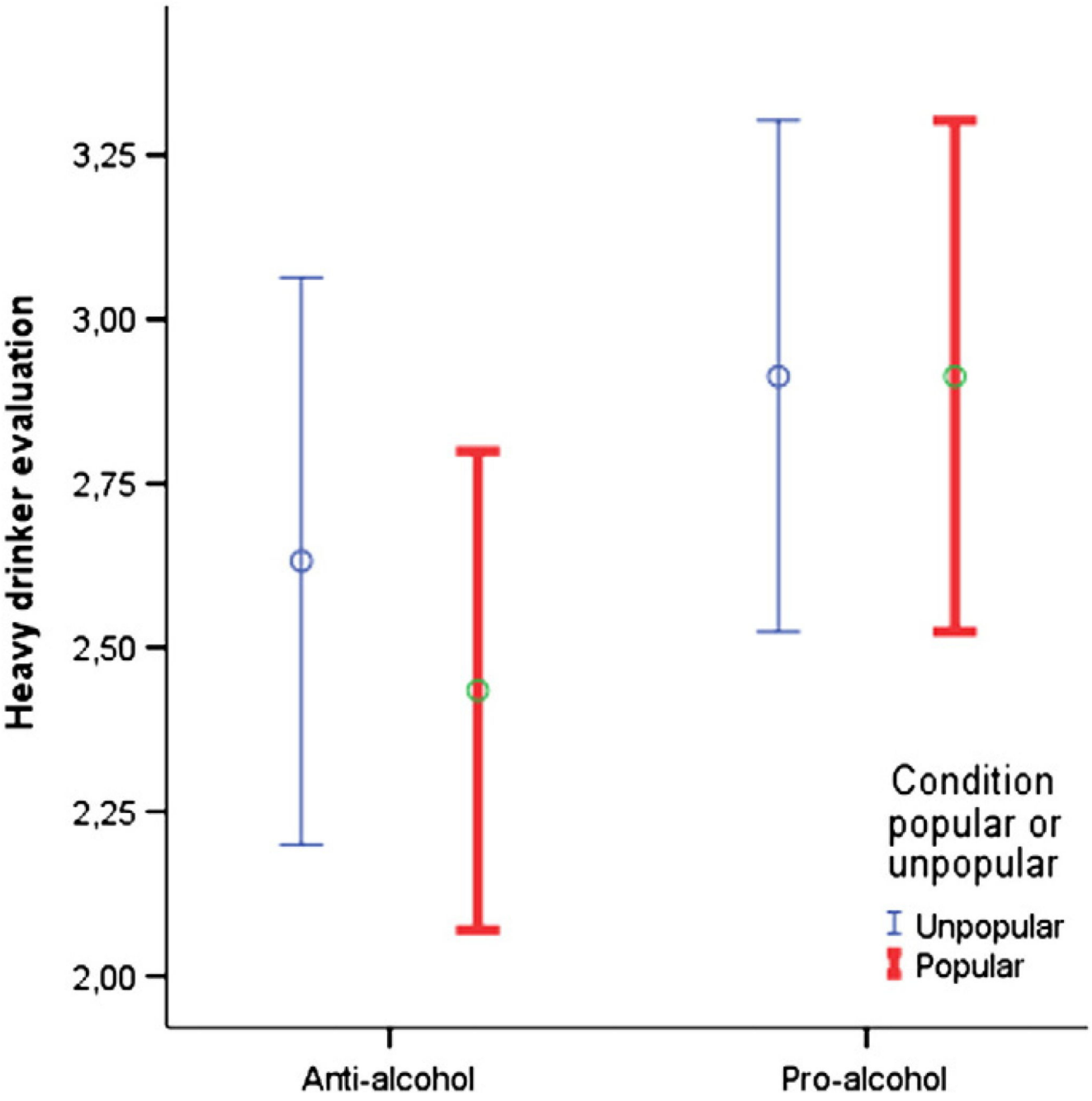

Fig. 1.
The effect of peer norms on participants' evaluation of heavy drinker prototypes after the chat room interaction, with 95% confidence intervals.

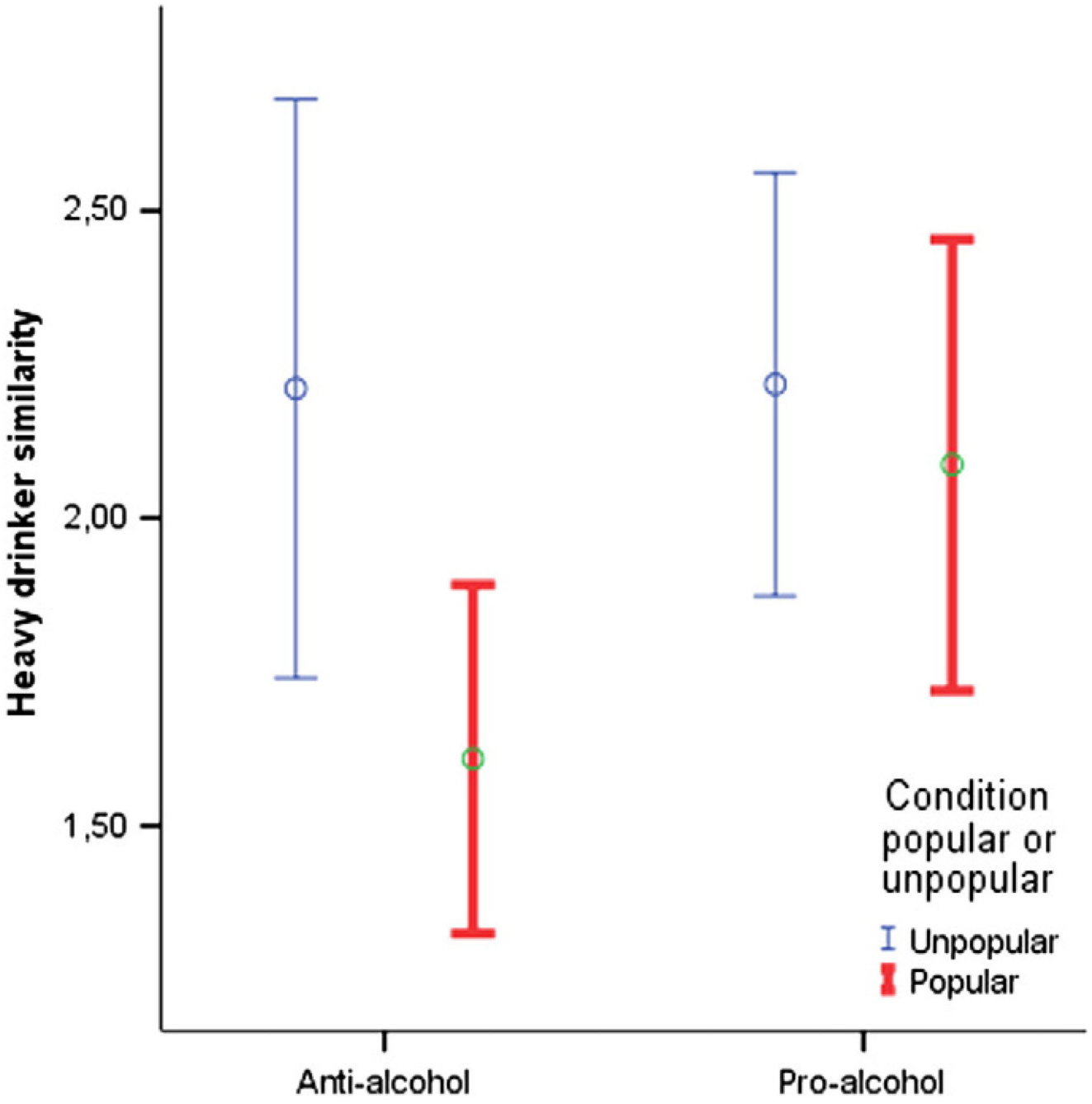

Fig. 2.
The effects of peer norms and peer popularity on participants' similarity to heavy drinker prototypes after the chat room interaction, with 95% confidence intervals.

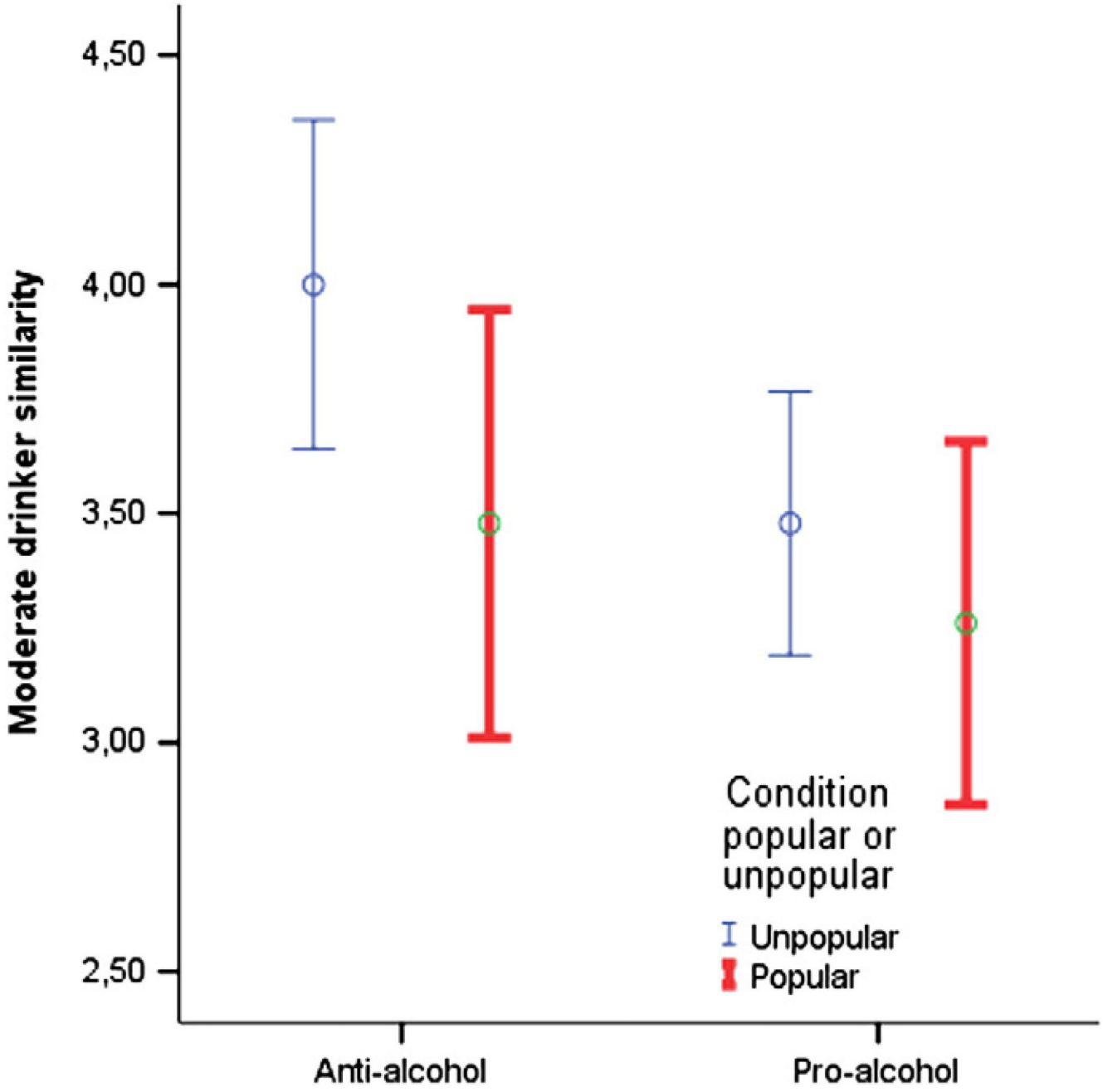

Fig. 3.
The effect of peer popularity on participants' similarity to moderate drinker prototypes after the chat room interaction, with 95% confidence intervals.

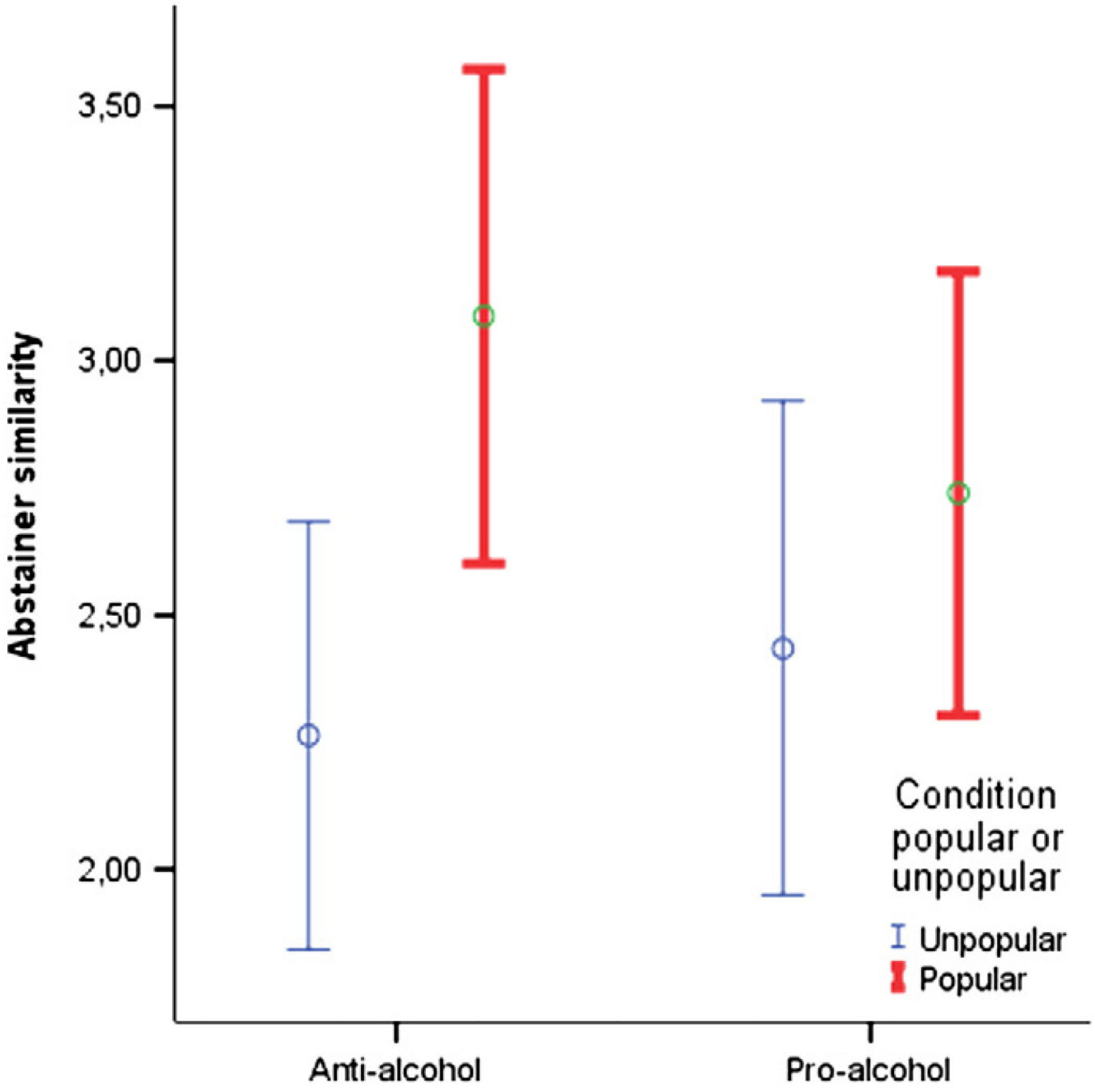

Fig. 4.

The effect of peer popularity on participants' similarity to abstainer prototypes after the chat room interaction, with 95% confidence intervals.

Table 1

Means and standard deviations for drinking behavior, and drinker prototype evaluation and similarity in the pretest (n = 88).

	***M* (*SD*)**	**Scale**
Alcohol frequency past four weeks	2.23 (0.87) (about 1 to 3 days)	1–6
Binge frequency past four weeks	1.13 (1.26) (about one time)	0–6
Consumed number of glasses past week	5.36 (8.04)	
Drinker prototypes:		
Heavy drinker evaluation	2.74 (0.95)	1–5
Heavy drinker similarity	2.05 (0.91)	1–5
Moderate drinker evaluation	4.03 (0.62)	1–5
Moderate drinker similarity	3.38 (0.90)	1–5
Abstainer evaluation	3.48 (0.90)	1–5
Abstainer similarity	2.71 (1.04)	1–5

Note. Higher prototype scores reflect more positive prototype evaluations and higher perceived similarity.

Table 2

Correlations between drinking behavior and drinker prototype evaluation and similarity in the pretest (n = 88).

	N drinks last week	Drinking frequency	Binge frequency	Abstainer evaluation	Abstainer similarity	Moderate drinker evaluation	Moderate drinker similarity	Heavy drinker evaluation
Drinking frequency	.56**							
Binge frequency	.74**	.64**						
Abstainer evaluation	−.30**	−.42**	−.42**					
Abstainer similarity	−.48**	−.53**	−.59**	.48**				
Moderate drinker evaluation	.04	.01	−.11	.12	−.04			
Moderate drinker similarity	.11	.30**	.11	−.20	−.31 **	.56**		
Heavy drinker evaluation	.15	−.03	.07	−.06	−.08	−.09	−.09	
Heavy drinker similarity	.40**	.41**	.58**	−.45**	−.63**	−.16	.08	.35**

** $p < .01$.

Table 3

Multivariate and univariate tests on the effect of peer norms (condition pro-alcohol/anti-alcohol), peer popularity (condition popular/unpopular), and the interaction between peer norms and peer popularity in the prediction of drinker prototypes while controlling for pre-test scores.

		df	*F*	*p*	Partial η^2
Heavy drinker prototypes					
Multivariate effects:	Evaluation pretest	2,77	17.44	.000	.31
	Similarity pretest	2,77	40.96	.000	.52
	Condition peer norms	2,77	3.96	.023	.09
	Condition popularity	2,77	3.29	.043	.08
	Norms * popularity	2,77	0.54	.585	.01
Univariate effects:	Dependent variables				
Evaluation pretest	Evaluation	1,78	27.69	.000	.26
	Similarity	1,78	0.47	.497	.01
Similarity pretest	Evaluation	1,78	0.00	.999	.00
	Similarity	1,78	72.21	.000	.48
Condition peer norms	Evaluation	1,78	6.58	.012	.08
	Similarity	1,78	4.20	.044	.05
Condition popularity	Evaluation	1,78	0.07	.795	.00
	Similarity	1,78	5.29	.024	.06
Moderate drinker prototypes					
Multivariate effects:	Evaluation pretest	2,81	2.45	.093	.06
	Similarity pretest	2,81	12.34	.000	.23
	Condition peer norms	2,81	1.07	.349	.03
	Condition popularity	2,81	3.34	.040	.08
	Norms * popularity	2,81	1.54	.220	.04
Univariate effects:	Dependent variables				
Similarity pretest	Evaluation	1,82	0.00	.962	.00
	Similarity	1,82	22.65	.000	.22
Condition popularity	Evaluation	1,82	0.00	.987	.00
	Similarity	1,82	6.14	.015	.07
Abstainer prototypes					
Multivariate effects:	Evaluation pretest	2,80	20.72	.000	.34
	Similarity pretest	2,80	20.42	.000	.34
	Condition peer norms	2,80	0.04	.963	.00
	Condition popularity	2,80	3.13	.049	.07
	Norms * popularity	2,80	1.70	.189	.04
Univariate effects:	Dependent variables				
Evaluation pretest	Evaluation	1,81	31.92	.000	.28
	Similarity	1,81	13.69	.000	.15
Similarity pretest	Evaluation	1,81	2.99	.087	.04
	Similarity	1,81	40.09	.000	.33

		df	*F*	*p*	Partial η^2
Condition popularity	Evaluation	1,81	0.00	.969	.00
	Similarity	1,81	6.30	.014	.07