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Groupdrink: The Effects of Alcohol on Intergroup Competitiveness.

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Abstract

Alcohol is often consumed in group settings; this paper examines the effect of alcohol upon intergroup competitiveness through the use of a prisoner's dilemma game. One hundred and fifty eight college students took part either as a member of a 4 person experimental single sex groups or alone. Participants either consumed alcohol (1.13g ethanol/kg body weight) or a placebo. Results showed no effect of alcohol on cooperative choice within individuals. However, groups were significantly less cooperative after alcohol than a placebo. After consuming alcohol, groups were also less cooperative than individuals. The results are discussed in terms of the way alcohol may affect focus of attention on group level cues.

Drinking alcohol has adverse effects on social behavior. These effects range from increased risk seeking (McMillen & Wells-Parker, 1987), greater sexual impulsivity (Stall, McKusick, Wiley, Coates, & Ostrow, 1986), as well as violent crime and increased aggressiveness (Pernanen, 1991). It is also plausible that alcohol can be socially facilitating. For example, in informal business lunch meetings alcohol may seem conducive to cooperative discussion. This perception may have some validity at moderate levels of alcohol consumption. For example, alcohol may help to reduce self-consciousness and alleviate anxiety in social situations (Hull, 1981).

Positive effects of alcohol may also occur when people are in groups. For example, Abrams, Hothrow, Hulbert, and Frings (2006) found that being in a group eliminated the alcohol-induced increased risk attraction that affected individuals. In contrast, salient everyday examples such as intergroup violence and hooliganism among soccer supporters suggest that negative effects of alcohol can be amplified when people are in groups. Although alcohol is often consumed when people are in groups (Abrams et al., 2006; Sayette, Kirchner, Moreland, Levine, & Travis, 2004), remarkably little work has examined experimentally the combined impact of being in a group and alcohol consumption on differing aspects of behavior.

An important characteristic of both group and individual interactions is the extent to which interactants exhibit cooperative or competitive behavior towards one another. Cooperation and competition can be examined using a social dilemma paradigm. A social dilemma is a situation in which a person must choose between maximizing his or her own gain at the risk of collective loss versus maximizing the collective gain at the risk of own loss (Komorita & Parks, 1996). Dawes (1980) defines a social dilemma as a situation in which a person playing the dilemma will generally be better off if they choose non-cooperatively, however, if everybody

chooses cooperatively then everyone is better off than if everyone had chosen non-cooperatively. Dilemmas such as these are ubiquitous within society for example, people have the dilemma every day of whether to take their car to work or take public transport (Hopthrow & Hulbert, 2005). Using a car rather than public transport, at least in the medium term, provides personal gain. However, in the long term if everybody uses public transport everybody gains more than if they use cars.

Groups can experience social dilemmas because they can act collectively as a unit, either for their own group gain or for the gain of the community as a whole. These principles can also be seen in real world intergroup dilemmas. For example, if a group of people that regularly visits a bar to socialize is very noisy or unheeding of other customers, other customers may cease to visit the bar. As a result, the bar may go out of business and the original group will suffer. Survival of the business depends on all the customers cooperating in their behavior.

Previous research supports the idea that groups' risk seeking differs after the consumption of alcohol. However, there appears to be no experimental evidence regarding the impact of alcohol on competitiveness and cooperation. According to the attention allocation model (Josephs & Steele, 1990; Steele & Josephs, 1990), alcohol consumption results in impaired perception of cues other than those that are most immediate and salient to people (an effect labeled 'alcohol myopia'). If alcohol myopia occurs in individuals within a certain group it is likely that the most salient cue will be their own group. In an intergroup dilemma involving two groups self interest refers to the interest of one's own group and collective interest refers to that of both groups. Therefore under conditions of alcohol myopia the most salient cue will be self interest rather than collective interest. According to Komorita and Parks (1996) non-cooperation corresponds to maximizing self interest, therefore, an

intoxicated group is likely to choose non-cooperatively. In contrast, individuals will not have the distracting cue of group membership. The most salient cue for individuals should be the dilemma they are involved in. Consequently, we would expect less difference between individuals that have and have not been drinking alcohol.

Method

Participants and Design

Sixty four male and 94 female non-psychology students aged between 19 and 25 (the legal age for drinking alcohol is 18 in the UK), of which 86% were Caucasian, were recruited from the student population at the University of Kent. Participants were randomly assigned to one of 30 four person groups, and the remaining 38 participated as individuals. In line with a large body of similar research (e.g. Schopler and Insko, 1999) and to minimize any potential problems of intergender dynamics such as sexual banter or harassment in groups that had been drinking, all experimental groups comprised participants of the same gender.

Recruitment was facilitated through the use of posters, placed on university notice boards, which advertised a recruitment and screening desk at the entrance to the university library. Participants were informed that they may be asked to consume a moderate amount of alcohol and would receive a payment of £10 (\$17.50) for 'about 4 hours of their time'. It was not mentioned that the experiment would involve groups or individuals. At the time of recruitment, participants were screened for indications of problems drinking using a revised Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Assland, Babor, De la Fuente, & Grant, 1993). The scaling and cut-off were modified to take into account the increased quantity and frequency of drinking of an undergraduate student population. Specifically, pilot research

indicated that two items were subject to ceiling effects, so these were removed and the cutoff was adjusted to 15 from 12. Eight percent of potential participants were rejected due to scores that were above the cut off point. In addition, participants who never consumed alcohol were not included in the experiment. Participants were asked to refrain from drinking alcohol for 18 hours before the start of the study and not to eat any food for 3 hours before the study commenced. They were told that the experimental phase would not last for the full 4 hours but that they would have to stay until their blood alcohol level had reduced to an acceptable level, a BAC of .028% or lower, and that during this latter phase of the experiment hot food would be provided.

We employed a 2 (condition: alcohol vs. placebo) by 2 (IG: individual vs. 4-person group) between-participants design. Participants played a standard intergroup or interindividual prisoners dilemma game for financial payoffs. Our dependent variable was the level of cooperative choice displayed by groups or individuals, operationalised by recording the number of J choices made by the groups or individuals (see Figure 1)

Measures and Procedure

On arrival participants were taken to a private area where they were weighed before being taken to a central room for the session briefing. They were asked to read and sign a medical screening and consent form and whether they had any questions. This form included a disclaimer in which they agreed not to drive or take part in any hazardous activities for 12 hours beyond the end of the experiment. Participants were informed that the experimenters would cover the costs of transport to and from home. Participants were told they would not be asked to complete any task that would place them under any undue stress or anxiety. They were told that they had the right to withdraw at anytime, in which case any partially completed materials would be

destroyed. If they chose to withdraw after consuming alcohol they would have to stay within the laboratory environment until their blood alcohol had reduced to an acceptable level, but would play no further role in the research. Participants were informed that they would be monitored at all times through the use of cameras and small sensitive microphones. Participants were then breathalyzed using a Lion SD400 Alcometer to ensure that they had no residual alcohol in their bloodstream so that any who registered positive for alcohol could be asked to leave the experiment. Participants were not told what condition of the experiment they were in.

Before being asked to drink, participants were given a lozenge ('Fisherman's Friend') with a very strong taste in order to cover up the taste of the drink. In the alcohol condition this was a mixture of Vodka 40% abv at 1.13g of ethanol per kg of body weight, mixed with equal parts orange juice and tonic water. Pilot testing indicated that, across a range of body weights, this amount of ethanol reliably ensured participants were intoxicated at 0.08% BAC. In the placebo condition the drink contained an orange juice and tonic water mix equivalent in quantity to the mixture in the alcohol condition with 2ml of vodka (an insufficient quantity to register on the Lion SD400 alcometer) floated on the surface of the liquid. Whilst they were drinking and for 20 minutes after completing the drinking phase, participants watched videos of comedy shows. Participants were monitored and none showed any signs of any ill effects from the alcohol. After the 20 minute absorption phase participants were breathalyzed before being split in to their experimental groups.

Participants were asked to take part in a multiple trial prisoner's dilemma game (see Figure 1 for payoff matrix). They were given typed instructions, which were also recorded on to a tape, and asked to read while listening to the tape. Participants were told that any money they earned in the dilemma would be added on

to their participation fee. *Groups* were told that they would be making a choice either J (the cooperative choice) or P (the non-cooperative choice), and that the combination of this choice and the choice made by another group in an adjacent room would dictate their payoff. They were told that their choice should be based upon a group decision and that they would each receive the payoff (i.e. if the payoff was £0.50 (\$0.85) they would each receive that sum not split it between them). *Individuals* were also asked to take part in a prisoner's dilemma and were told that their payoff was the function of the combination of their choice and that of an *individual* in an adjacent room.

In fact there was no opposing group or individual. Instead, groups and individuals played against a predetermined strategy referred to as 'Tit-for-Tat' (Axelrod, 1984). In this strategy the simulated opponent repeats the choice made by the real player on the previous trial. Thus, if on one trial the real participants choose J (the cooperative choice) then on the next trial the predetermined strategy of the opposing player is also J. Participants were not told how many trials there would be.

Four trials were conducted for each set of participants. Participants were told that on the 1st trial a coin would be tossed to see which group/individual would go first. In fact the fictitious opposing player always 'won' the coin toss. On this first trial the bogus group/individual always chose the J (cooperative choice) as specified by Axelrod's (1984) Tit-for-Tat strategy. For subsequent trials participants were told that both sides would make their choices at the same time and that feedback on the other sides choice would no longer be given at the beginning of the trial but instead at the end of the trial after the decision making had been made. The Tit-for-Tat strategy was chosen because of its classification as a 'nice' strategy (Axelrod, 1984) i.e. good

at promoting cooperative behavior. We were expecting intoxicated groups to be low in cooperative choice. Therefore, we wanted a strategy that would avoid floor effects.

Experimenters and participants communicated with each other through the use of 2 way intercoms and video cameras. After participants made their choice they were asked to hold up a card showing their choice to the camera. When giving feedback or instructions or when asking questions, the experimenters and participants communicated via a voice only intercom system. For the first trial participants were given two minutes to make their decision, for the second trial one minute, and for the final two they were given 30 seconds. Pilot testing indicated that participants used a larger period of time to make their decisions on the first two trials in comparison to trials three and four. This testing indicated that they were using this time to cement their understanding of the payoff matrix system used.

On completion of the experiment participants were breathalyzed and debriefed before being offered hot food and given more comedy videos to watch. They stayed at the laboratory until their BAC was below 0.028%. At this point they were thanked, reminded of the disclaimers they signed, and paid including earnings from the social dilemma. They were asked if they were feeling any ill effects from the alcohol. No one mentioned any ill effects at this stage.

Results

Data were coded to derive the standard measure of proportion of cooperation $P(c)$. Participants drinking alcohol were breathalyzed immediately after the drinking phase and reached a mean BAC of .055%. This is consistent with levels reported by Sayette et al. (2004) and Abrams et al. (2006), because participants would still have been on the upward slope of the absorption curve.

The dilemma was split into two blocks of two trials (as used in previous research, e.g. Parks & Rumble, 2001; Sheldon, 1999). Mean P(c) scores were calculated for Block 1 (trials 1 & 2) and Block 2 (trials 3 & 4). The fixed nature of the first response on the 'Tit-for-Tat' strategy and the need for the participants to learn the dilemma mean that the first two trials were required for participants to understand the nature of the contingencies (i.e. until the end of the first block they may not be aware of the tit-for-tat responses generated in other player). An element of randomness is introduced by the participant's initial responses that may condition the likelihood of cooperation on subsequent trials. Therefore, it is useful to account for baseline differences in initial responses when analyzing the overall level of cooperative choice. Thus, Block 1 was treated as a covariate and Block 2 as the dependent variable (cf. Parks, Sanna, & Posey, 2003).

A 2 (IG) x 2 (Alcohol) x 2 (Gender) ANCOVA revealed no significant main effects or interactions involving gender (all F s $<.15$). Therefore subsequent analyses were collapsed across gender. Raw means and standard deviations are displayed in Table 1. There was the expected significant covariate effect of Block 1 $F(1,63) = 81.285, p <.001, \eta^2 = .563$. Of greater importance is the significant interaction between IG and Alcohol, $F(1,63) = 8.699, p = .004, \eta^2 = .121$. Figure 2 shows the pattern of adjusted means for this interaction. Simple effects analysis indicated that, within the alcohol condition, groups were significantly less cooperative with other groups ($M = .46$) than individuals with other individuals ($M = .74$), $F(1,64) = 7.023, p = .01, \eta^2 = .099$. Moreover as predicted groups in the alcohol condition were significantly less cooperative with other groups than groups in the placebo condition ($M = .85$), $F(1,64) = 8.364, p = .005, \eta^2 = .116$. There was no significant difference in

the level of cooperation for individuals in the alcohol versus placebo condition ($M = .62$), or between groups and individuals within the placebo condition.

Discussion

The primary aim of this study was to examine the effects of alcohol consumption and group membership upon cooperative behavior between individuals and groups. The results show that groups are less cooperative when they are intoxicated than when they are not intoxicated. In addition, intoxicated groups are less cooperative than intoxicated individuals. This supports the view that groups are less able to attend to the long term consequences of non-cooperation within a social dilemma. The alcohol myopia model (Josephs & Steele, 1990; Steele & Josephs, 1990) holds that alcohol impairs perception of cues that are not immediately salient. The results of this study are consistent with the idea that when people are consuming alcohol in groups, the group itself may dominate their attention.

We expected that, after consuming alcohol, people in groups would be less able to attend to cues other than their immediate group membership, and therefore would choose the immediate payoff for their group (i.e. not to cooperate) rather than considering the mutual benefits of a long term mutually cooperative strategy. In contrast, it seemed unlikely that individuals' attention could be attracted by any salient cues apart from the dilemma and, therefore, we did not expect them to respond differently to the dilemma even after consuming alcohol. Our findings support this prediction. Examining the temporal dimension and impulsivity may help us to understand the process behind this effect more thoroughly; it is possible that groups that have been drinking have increased levels of impulsivity and opt for an immediate outcome rather than a delayed outcome as described in the temporal discounting literature (e.g. Bickel, Odum, & Madden, 1999).

Insko et al. (1998) showed that (non-intoxicated) groups and individuals do not display significantly different levels of cooperation in a 'Tit-for-Tat' dilemma. The present findings also show a non-significant difference between group and individual levels of cooperation in the placebo condition, but show that group behavior changes when members are intoxicated. In terms of our introductory example, it does appear that, compared with individuals, groups of drinkers are more likely to favor their own interests over those of the wider collective.

A potential limitation of this study is that we did not measure group members' motivations. Whereas one motive could be to maximize the group's gain, another might be just to prevent the other group from gaining, and a third may be to actively harm the other group. Hoaken and Pihl (2000) found evidence for an effect of provocation upon aggression in intoxicated individuals, it is conceivable that an intoxicated group interprets non-cooperation from another group as more provocative than a non intoxicated group or individuals. All these motives may result in similar behavior in a social dilemma, but may imply different actions in, for example, a heated argument or potential physical conflict. Therefore, future research should consider the way alcohol affects motivational processes in groups as well as its impact on cognition and decision making. Abrams et al. (2006) noted that there may be situations in which pre-established group norms push the group in a particular direction and there are different ways that alcohol could impinge on this effect.

The payoffs in this study were relatively small. However, Schopler, Insko, Graetz, Drigotas, and Smith (1991) found when studying the individual-group discontinuity effect that changing the outcome size by a factor of 10 did not change the findings. Therefore, the results of the current study are likely to be high in validity. However, further research may be needed to explore the generalizability of

these findings (e.g. to situations where competition might incur a more threatening or violent response from an opponent).

The aim of the present study was to add to the small but growing body of experimental literature testing the impact of alcohol upon group behavior and group processes. The findings demonstrate that one consequence of alcohol is that groups may become less cooperative with other groups. This has significant implications for policies surrounding alcohol use in a range of social and organizational settings.

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Table 1: Means and Standard Deviations for Block*IG*Alcohol Interaction

		Block 1		Block 2	
		Mean	SD	Mean	SD
Individual	Alcohol	.458	.450	.625	.433
	Placebo	.577	.392	.596	.425
Group	Alcohol	.615	.409	.462	.477
	Placebo	.765	.399	.853	.235

Figure Captions

Figure 1: The Payoff matrix given to participants indicating their and others' possible payoff in pence.

Figure 2: Adjusted means of Alcohol and IG for Block two.

Figure 1.

		Column Group/Individual	
		J	P
Row Group/Individual	J		
	P		

Figure 2.

