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## Reports

The color of safety: Ingroup-associated colors make beer safer<sup>☆</sup>Chris Loersch<sup>\*</sup>, Bruce D. Bartholow

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## ABSTRACT

Individuals display high levels of trust and express feelings of safety when interacting with social ingroup members. Here, we investigated whether cues related to ingroup membership would change perceptions of the safety of alcohol. Participants were exposed to images of beer in either a standard can or a can featuring the colors of their university (i.e., 'fan cans'). We hypothesized that exposure to fan cans would change perceptions of the risks of beer drinking. Results showed that participants exposed to fan cans rated beer consumption as less dangerous (Experiment 1), were more likely to automatically activate safety-related mental content after unconscious perception of beer cues (Experiment 2), and viewed their ingroup's party practices as less dangerous (Experiment 3). These results provide evidence that ingroup-associated colors can serve as a safety cue for alcohol, which may in theory perpetuate alcohol-related risk-taking, already a cause for concern on college and university campuses.

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Across cultures, social groups go to great lengths to associate themselves with particular color schemes, thereby facilitating the identification of group members and their activities (Georgeson & Lampard, 2005). A prime example of this practice occurs within the American college and university system, where considerable money is spent outfitting sports teams in group colors (Weinbach, 2007). This university-color association provides an important source of revenue to many institutions, perpetuating sales of products featuring school colors to students, alumni, and fans. Unsurprisingly, unaffiliated companies frequently attempt to take advantage of these associations, marketing products in colors representative of local groups in the hope that product desirability and sales will increase.

Critically, such practices not only have the potential to influence corporate profits but may also convey subtle messages to group members concerning the types of items they should possess and how they should feel about the products' purchase and use (e.g., Han & Shavitt, 1994). Although likely to be innocuous in many circumstances, this may have negative consequences. Recently, we considered one novel implication of the practice when a large (formerly) American brewer began distributing university-themed beer cans – so-called 'fan cans' – in several college markets (e.g., black and gold cans in Missouri; scarlet and gray cans in Ohio). Representatives from many of the affected universities complained

to the brewer (Olivares, 2009; Smith, 2009), fearing that fan cans would affect underage drinking practices, perhaps exacerbating the already challenging problems stemming from college student drinking (e.g., increased risk-taking and sexual assault; see Cooper, 2002).

In particular, our hypothesis regarding these fan cans was informed by past research on ingroup emotion. This work indicates that cues suggesting ingroup affiliation elicit feelings of trust and safety (Voci, 2006), and that individuals behave in a more trusting manner with ingroup compared to outgroup members (e.g., Brewer, 2008). Because of these effects, it is possible that beer presented in ingroup packaging will change perceptions regarding the safety of this product. In other words, simply associating an object with one's ingroup might make it seem safer and more trustworthy than it would otherwise. Thus, we investigated the possibility that exposure to beer cans associated with the ingroup might communicate a subtle message regarding the safety of beer, causing participants to perceive beer and its consumption as less dangerous after exposure to fan cans compared to standard cans.

We tested this hypothesis in two initial experiments by exposing participants to either standard beer cans or fan cans and then examining perceptions regarding the dangerousness of drinking beer (Experiment 1) and the degree to which presentation of the word "beer" automatically activated cognitions related to safety and danger (Experiment 2). In a third experiment, we utilized a fully crossed, 2 (beverage type: beer vs. water) × 2 (logo color: ingroup vs. neutral) design to more precisely test the factors that may cause the fan can to produce these effects. Across all experiments, we predicted that exposure to fan cans would increase the extent to which beer and related drinking behaviors are associated with safety.

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## Experiment 1

### Participants

Ninety-eight University of Missouri undergraduates (48 women) were randomly assigned to one of two conditions in a single factor (beer can type: standard vs. fan can) between-subjects design.

### Materials and procedure

#### Beer exposure

During this manipulation, participants viewed pictures of various beverages and were asked to answer six questions about their feelings towards each (e.g., “How desirable is this beverage?” and “How likely would you be to share this beverage with a friend?”). Each question was presented on a separate screen and was accompanied by an image of the beverage under consideration (i.e., a can of beer, a bottle of Dasani® water, a can of Coca-Cola®, and a can of ginger ale). Participants in the standard can condition viewed a picture of a regular Bud Light® can, whereas those in the other condition viewed the Bud Light® fan can marketed in central Missouri (colored black and gold after the University of Missouri). Both images were actual product photographs and featured a single can set against a black background. The photographs were identical except for the cans' labels.

#### Safety assessment

After completing the above manipulation, participants' perceptions of alcohol safety were measured. Participants were asked to answer the question, “How dangerous is it to drink beer?” on a 7-point scale anchored by the values 0 (*Not at all*) and 6 (*Very*).

## Results and discussion

As predicted, exposure to the fan can caused participants to judge beer drinking as significantly less dangerous ( $M = 3.16, SD = 1.30$ ) than exposure to the standard beer can ( $M = 3.71, SD = 1.35, t(96) = 2.06, p = 0.04, d = 0.41$ ). We also examined whether participants' preferences for beer differed across can types by computing a single-item index averaging responses to the six questions answered during the beer exposure manipulation. This measure was not significantly affected by our manipulation,  $t < 1$  (no single items were affected;  $ps > 0.18$ ).

As expected, participants who were briefly exposed to beer packaged in colors associated with their university subsequently perceived beer drinking as less dangerous than individuals who had seen a standard beer can. Thus, it appears that the mere act of associating beer with ingroup-related colors communicated a subtle message about the safety of this product, decreasing perceptions of its dangerousness. The fact that this effect emerged without influencing participants' preferences towards the beverages is also advantageous for testing our hypothesis. First, it highlights the potential insidious nature of associating a product with ingroup-related colors, demonstrating that such a manipulation can have indirect effects that aren't observed when individuals are directly queried about the target object (cf. Crano & Alvaro, 1998). Perhaps more importantly, this null effect also eliminates a powerful confound. If preferences had been affected, one might easily predict that increased liking of the fan can would mediate any effect on the safety of beer (because of associations between liking and safety; Fazio, Eiser, & Shook, 2004).<sup>1</sup>

<sup>1</sup> Although useful for interpretation of the study's results, many readers will be aware that this finding is somewhat inconsistent with research showing that individuals prefer ingroup-related objects (e.g., Greenwald et al., 2002). One possible explanation for this difference is the limited age range of our samples. Consuming alcohol was illegal for all but three of our participants (across all studies), perhaps causing most individuals to report dampened beer preferences and creating a ceiling effect.

Although Experiment 1 provided initial support for our hypothesis that ingroup cues alter perceptions of the safety of drinking beer, it is unclear whether this effect only emerges when participants are directly asked about this topic or if it might also occur spontaneously when participants encounter any stimulus related to the product. To investigate this issue, we changed the dependent measure for Experiment 2. Participants instead completed a primed lexical decision task (LDT) in which we measured the accessibility of information related to safety and danger after the subliminal presentation of beer-related and neutral cues.

This LDT procedure has two primary advantages over our previous measure. First, because participants are never directly asked about their feelings towards the product, it circumvents any concerns that the effects of Experiment 1 were due to participants' strategic recruitment of information when responding to explicit questions about the safety of beer. Second, because we present beer primes subliminally, we can examine whether the effect discovered in Experiment 1 might also emerge automatically, whenever individuals encounter subtle cues related to beer (Neely, 1991).

## Experiment 2

### Participants

Sixty-seven University of Missouri undergraduates were randomly assigned to conditions in a single factor (beer can type: standard vs. fan can) between-subjects design. One participant with an average LDT reaction time greater than three standard deviations from the mean was dropped from the study, leaving data from 66 participants in the final analyses (39 women).

### Materials and procedure

#### Beer exposure

Participants completed the same manipulation described in Experiment 1, except that in this version they only answered six preference questions for a can of beer and a bottle of Dasani® water (in that order). All other aspects of the manipulation were identical.

#### Lexical decision task

Participants next completed a 40-trial primed LDT. The target stimuli consisted of five safety-related words (*controllable, good, harmless, safe, and secure*), five danger-related words (*bad, dangerous, harmful, hazardous, and risky*), and ten pseudohomophone nonwords (e.g., *furst, keap, wawl*, etc.; see Joordens & Becker, 1997). Each target stimulus was presented twice, in a randomized order, once preceded by the subliminal prime ‘beer’ and once by the subliminal non-word letter string ‘qxyz’. This procedure allowed us to estimate the degree to which the beer prime facilitated responding to these stimuli, controlling for baseline reaction times (RTs) to each stimulus type. On each trial of the LDT, a fixation point (\*) appeared for 1000 ms and was immediately followed by a 16 ms prime presentation (either *beer* or *qxyz*). The prime was then cleared and masked with a string of Xs for 250 ms, after which the target letter string was presented. Participants' task was simply to indicate, as quickly as possible, whether or not the letter string was a correctly-spelled English word. Targets stayed on the screen until a response was made. All stimuli were displayed foveally, in the center of the screen. At the conclusion of the task, participants completed a funnel-debriefing procedure (Bargh & Chartrand, 2000) to probe for awareness of the subliminal primes. No participant reported observing the primes.

## Results and discussion

To test our hypothesis, we created a single value representing the degree to which the presentation of the subliminal prime *beer* led to a

**Table 1**

Means (and standard deviations) of facilitation scores (neutral prime–beer prime) for safety- and danger-related words as a function of condition in Experiment 2.

DV and condition		Facilitation scores		Safety accessibility bias <sup>a</sup>
		Safety words	Danger words	
Raw values	Fan can	100.11 ms (273.12)	1.54 ms (200.56)	98.58 ms (374.61)
	Standard can	–28.27 ms (190.48)	16.20 ms (159.87)	–44.47 ms (245.43)
Log-transformed values	Fan can	0.07 (0.23)	–0.02 (0.19)	0.09 (0.33)
	Standard can	–0.02 (0.18)	0.04 (0.14)	–0.05 (0.23)

<sup>a</sup> Safety accessibility bias = the difference in RT to safety- and danger-related words, respectively, following the neutral prime minus the RT to those words following the 'beer' prime.

safety-related bias in participants' RTs during the LDT, as a function of the condition to which they were assigned (fan can vs. standard can). To compute this index, we separately determined for each participant the degree to which the *beer* prime affected RTs to safety and danger words, relative to RTs to these same words when they were preceded by the neutral prime. The danger facilitation score was then subtracted from the safety facilitation score to create the measure of interest, which we call the *safety accessibility bias*. Higher values on this measure represent a greater bias toward responding quickly to safety-related information following the *beer* prime, indicating that the *beer* prime makes information related to safety more accessible than information related to danger.<sup>2</sup>

The LDT results are displayed in Table 1.<sup>3</sup> As predicted, participants exposed to the fan can demonstrated a significantly greater safety accessibility bias on the LDT than did individuals in the standard can condition,  $t(64) = 2.10$ ,  $p = 0.04$ ,  $d = 0.51$ .<sup>4</sup> As in Experiment 1, the index representing participants' preference for beer did not differ by condition,  $t < 1$  (no single items were significantly affected; all  $p > 0.14$ ).

Replicating the results of Experiment 1, these data again indicate that the presentation of beer in colors associated with their university changed the way participants thought about beer in general. When subsequently encountering a subtle beer cue (i.e., the subliminal prime *beer*), participants were biased towards the identification of safety-related information and away from the identification of danger-related information, but only if they previously had seen the fan can. Importantly, this facilitation effect emerged even though the beer prime was presented subliminally, precluding the possibility that observed effects were due to conscious, deliberative processing. Instead, it appears that recent, prior exposure to the fan can caused participants to automatically activate safety-related information as soon as they encountered beer-related stimuli in the external environment.

In combination, the results of Experiments 1 and 2 provide good evidence for our hypothesis regarding the influence of the fan can on beer safety. The design of these studies, however, prevents us from making a strong causal conclusion. That is, the effects observed could be due simply to exposure to ingroup-associated colors and may have nothing to do with the pairing of these colors with beer. In order to

investigate this issue, Experiment 3 featured a fully crossed design in which we presented beer or water in either neutral or ingroup colors, permitting a stronger test of our hypothesis. In addition, Experiment 3 sought to extend the findings of the previous studies into the public health domain by embedding our beverage manipulation in an actual "party safe" public service advertisement and examining the impact of this manipulation on participants' ratings of the safety of parties at the University of Missouri.

### Experiment 3

#### Participants

Seventy-seven University of Missouri undergraduates were randomly assigned to the conditions of a 2 (beverage: beer vs. water)  $\times$  2 (logo color: ingroup vs. neutral), between-subjects design. Ten non-native English speakers were eliminated from the analyses, resulting in a final sample of 67 participants (45 women).

#### Materials and procedure

##### Beverage exposure

During this manipulation, participants read a one page public service advertisement (PSA) created by a large West coast public university. The original PSA contained a number of "party safe" or harm-reduction techniques (e.g., counting drinks, appointing a designated driver, and using a buddy system; for review see Marlatt & Witkiewitz, 2010) and was modified here to contain a large image of three drink cans (Coca-Cola®, ginger ale, and a focal beverage) under a headline entitled, "Never let your drink out of your sight." The focal beverage was manipulated so that the participants were exposed to beer or water with either a neutral or ingroup-colored label. The beer images were identical to those used in Experiments 1 and 2. The water images were either a bottle of Dasani® or a similar bottle with a black and gold University of Missouri tiger logo on the label (i.e., 'fan water').

##### Safety assessment

After reading the short PSA, participants rated the perceived safety of the local "party scene" at the University of Missouri. This measure was a composite of individuals' responses to the three questions: "How often do students at the University of Missouri get sexually assaulted while intoxicated?", "On a standard socializing or 'party' night, how many drinks does the average University of Missouri student consume?", and "How often do students at the University of Missouri put other/additional drugs into others' drinks without their knowledge?" Participants rated each item on 7-point scales anchored by the values 0 (*None or Never*) and 6 (*A lot or Very often*). Responses on these items were reverse scored (so that higher values indicate greater perceived safety) and averaged to create a single safety index.

### Results and discussion

The influence of our manipulations was examined using ANOVA. The only significant effect to emerge from this analysis was the interaction

<sup>2</sup> Testing whether this value differs by condition is identical to a test of the can type (fan can vs. standard can)  $\times$  word type (safety vs. danger)  $\times$  prime type (beer vs. neutral) interaction.

<sup>3</sup> All analyses were conducted on natural log-transformed values (see Fazio, 1990). To reduce the influence of extreme responses, raw reaction times  $< 300$  ms (0.5%) and  $> 3000$  ms (1.1%) were replaced by these respective values (Greenwald, McGhee, & Schwartz, 1998). All incorrect trials (7.5%) were excluded from analyses.

<sup>4</sup> In order to more precisely examine the effect of our manipulation we also tested its influence on the safety and danger facilitation scores individually. These analyses suggest that changes in reaction times to both safety and danger-related words contributed to the reported safety accessibility bias. Participants exposed to the fan can tended to have a greater safety facilitation score than participants exposed to the standard beer can,  $t(64) = 1.71$ ,  $p = 0.09$ ,  $d = 0.42$ . A similar, although weaker, trend was observed for the danger facilitation score. Participants exposed to the fan can displayed a somewhat lower danger-related facilitation score (providing weak evidence of inhibition) compared to their counterparts in the standard beer can condition,  $t(64) = -1.39$ ,  $p = 0.16$ ,  $d = 0.34$ .



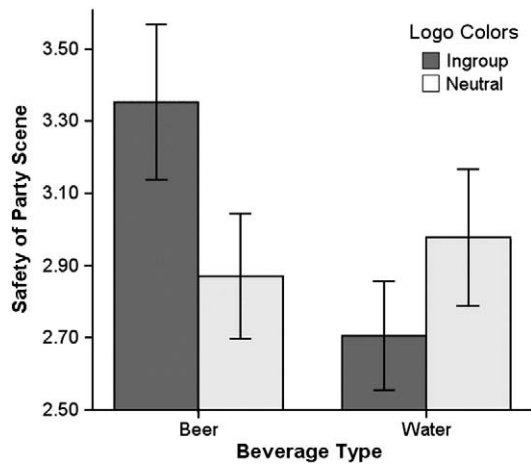


Fig. 1. Perceived safety of the University of Missouri party scene as a function of beverage and logo color. Larger numbers indicate greater perceived safety.

between beverage type and logo type,  $F(1, 63) = 4.23$ ,  $p = 0.04$ ,  $\eta_p^2 = 0.06$  (see Fig. 1). In line with the results of Experiments 1 and 2, simple effects analyses showed that individuals exposed to the fan can tended to judge the local party scene as safer than participants exposed to the standard beer can,  $F(1, 63) = 3.63$ ,  $p = 0.06$ ,  $\eta_p^2 = 0.05$ . Critically, this effect was unique to beer associated with the ingroup, as participants exposed to the fan can also found the local party scene significantly safer than individuals exposed to water with an ingroup-colored logo,  $F(1, 63) = 6.35$ ,  $p = 0.01$ ,  $\eta_p^2 = 0.09$ . These were the only significant simple effects to emerge; there were no differences in the safety ratings of participants in the two water conditions,  $F = 1$ , or participants who saw beer and water only in standard label colors,  $F < 1$ . Finally, to more directly examine our prediction that participants exposed to the fan can would view the local party scene as safer than individuals in all other conditions, we computed a planned contrast comparing the safety ratings of participants in the fan can condition to the mean value of participants in the other three conditions. This contrast was significant,  $F(1, 63) = 5.68$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.08$ .

In addition to providing a conceptual replication of Experiments 1 and 2 in a new paradigm, the results of Experiment 3 demonstrate that the safety bias produced by exposure to the fan can is indeed unique to beer associated with participants' ingroup. By presenting both beer and water in University of Missouri associated colors we were able to provide stronger evidence for our hypothesis. As predicted, it was only the beer fan can that modified participants' feelings regarding the safety of consuming alcohol. Importantly, Experiment 3 also extended the results of the earlier studies by examining the influence of these manipulations on the perceived safety of the University of Missouri party scene. It is both interesting and somewhat disturbing that individuals exposed to the fan can found local parties less dangerous, an effect that may actually prevent them from adopting the harm-reduction drinking practices recommended in the PSA they read.

## General discussion

Research has consistently demonstrated that people view members of their social ingroups as trustworthy and safe (see Brewer, 2008). The current work showed that this sense of interpersonal safety for ingroup members appears to extend to a product that, via its packaging, conveys cues for ingroup affiliation. In short, associating a relatively dangerous product with ingroup-related colors changed our participants' perceptions regarding the product's safety. After seeing a 'Mizzou' themed fan can, our Missouri undergraduate participants rated beer consumption as less dangerous (Experiment 1), automatically activated information related to safety upon exposure to a

subliminal beer prime (Experiment 2), and rated the local party scene as less dangerous (Experiment 3). These results are particularly important given that alcohol consumption is associated with unsafe behavior, increasing individuals' risk-taking (Lane, Cherek, Pietras, & Tcheremissine, 2004), aggressiveness (Giancola, 2000), and likelihood of serious injury (Hingson, Heeren, Winter, & Wechsler, 2005).

The current findings appear to be the first of their kind in several respects. To our knowledge, Experiment 1 provides the first evidence that simply presenting a product in colors associated with a social group can change peoples' perceptions regarding the use of that product. Although considerable research has shown that product coloring has strong influences on consumers' product judgments (Singh, 2006), Experiment 2 is the first to demonstrate that product color can also change basic, automatically activated associations in memory. Additionally, no previous research has demonstrated that the presence of ingroup-associated objects can serve as a general safety cue.

Perhaps the most important aspect of this research is its implications for understanding the (presumably) unintended consequences of marketing alcohol or other dangerous substances in colors representing particular social groups. Although a number of university officials have publicly stated their alarm concerning the fan can marketing campaign, representatives of the brewer in question consistently stated their belief that the cans would not detrimentally affect college student drinking, and noted their long support of efforts to fight underage drinking (Hechinger, 2009). Still, the National Institute on Alcohol Abuse and Alcoholism reports that nearly 600,000 college students per year, most underage, engage in unsafe behavior while drinking and become injured. Perhaps more alarming still is that another 97,000 students per year become the victims of alcohol-related sexual assault (Hingson et al., 2005). The current results suggest the unnerving possibility that beer marketed in college team colors could change perceptions about its safety, potentially worsening these already troubling figures.

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