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The Effects of Alcohol on the Emotional Displays of Whites in Interracial Groups

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Discomfort during interracial interactions is common among Whites in the U.S. and is linked to avoidance of interracial encounters. While the negative consequences of interracial discomfort are well-documented, understanding of its causes is still incomplete. Alcohol consumption has been shown to decrease negative emotions caused by self-presentational concern but increase negative emotions associated with racial prejudice. Using novel behavioral-expressive measures of emotion, we examined the impact of alcohol on displays of discomfort among 92 White individuals interacting in all-White or interracial groups. We used the Facial Action Coding System and comprehensive content-free speech analyses to examine affective and behavioral dynamics during these 36-min exchanges (7.9 million frames of video data). Among Whites consuming nonalcoholic beverages, those assigned to interracial groups evidenced more facial and speech displays of discomfort than those in all-White groups. In contrast, among intoxicated Whites there were no differences in displays of discomfort between interracial and all-White groups. Results highlight the central role of self-presentational concerns in interracial discomfort and offer new directions for applying theory and methods from emotion science to the examination of intergroup relations.

Keywords: interracial interactions, alcohol, discomfort, self-presentation, nonverbal behavior

Researchers have long been interested in understanding emotional responses to members of other racial groups. Allport (1954) was among the first to emphasize the importance of emotions in interracial relations, writing in his seminal text, *The Nature of Prejudice,* "Defeated intellectually, prejudice lingers emotionally" (p. 328). Recent meta-analyses reveal that emotions toward minorities are twice as likely to predict behavior toward these groups as are cognitive processes (Pettigrew & Tropp, 2008; Talaska, Fiske, & Chaiken, 2008). In other words, aside from what people think, understanding how people feel about members of other racial groups may be key to understanding modern race relations (Mackie, Smith, & Ray, 2008).

While "basic" emotions such as fear and disgust are widely held to characterize emotional responses to outgroup members, research suggests that interracial interactions are often marked by more subtle, blended emotions such as unease and discomfort.[1] Interactions with individuals of another race are often stressful and both cognitively and emotionally taxing (Trawalter, Richeson, & Shelton, 2009). Individuals experience increased physiological arousal during interracial interactions (Mendes, Major, McCoy, & Blascovich, 2008) and show evidence of cognitive depletion following intergroup exchange (Richeson & Shelton, 2007). Discomfort experienced during interracial interactions is associated with avoidance of future interracial interactions (Plant, 2004; Plant & Devine, 2003; Stephan & Stephan, 1985), and such avoidance can lead to serious negative consequences for race relations (Allport, 1954; Pettigrew & Tropp, 2008).

While the negative consequences of interracial discomfort are well-documented, understanding of the causes of this discomfort in Whites is still incomplete. Theories of prejudice suggest that the negative affect experienced by Whites in interracial contexts is attributable directly to negative racial attitudes. Broadly speaking, such theories posit that the vast majority of White individuals in the U.S. are prejudiced against African Americans (Crandall & Eshleman, 2003; Devine, 1989; Gaertner & Dovidio, 1986). Many theorists define this "unadulterated" prejudice as a negative affective state directed toward minorities (Crandall & Eshleman, 2003; Gaertner & Dovidio, 1986; Katz & Hass, 1988). Broadly termed "two-factor theories" by Crandall and Eshleman (2003), these models propose that self-presentational concern serves to counteract or "hold in check" prejudicial emotion. While some theorists

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[1] Throughout this article, we use the term *discomfort*, which has been widely employed in the literature on intergroup relations (e.g., Dovidio & Gaertner, 2004; Dovidio et al., 1997). Discomfort is an affective experience that is characterized by a general state of negative arousal, and is not found among the basic emotions.

fail to identify which specific negative emotions are linked to unadulterated racial prejudice in Whites (Crandall & Eshleman, 2003), others specify negative emotions such as disgust, contempt, and fear (Fiske, Cuddy, Glick, & Xu, 2002; Gaertner & Dovidio, 1986). Importantly, theorists further suggest that a general feeling of discomfort is characteristic of the prejudice of Whites against Blacks in the United States today (Dovidio & Gaertner, 2004; Dovidio, Kawakami, & Gaertner, 2002, Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Fiske et al., 2002; Gaertner & Dovidio, 1986).

More recently, researchers have identified presentational concern as a potential cause of interracial discomfort. Like the theories of prejudice outlined above, this research assumes that many Whites carefully monitor their behaviors during interracial interactions in order to avoid appearing racist (Monteith, Deneen, & Tooman, 1996). However, in contrast to two-factor theories of prejudice, which suggest that presentational concern decreases the expression of negative interracial emotions, this research suggests that presentational concern may actually induce negative emotions during interracial exchanges (Plant & Butz, 2006). Studies have uncovered links between concern about appearing prejudiced and subsequent interracial anxiety, suggesting that behavioral manifestations of this anxiety may "leak" within the context of interracial interactions (Plant, 2004; Shelton, West, & Trail, 2010). Furthermore, investigators have hypothesized that presentational concerns disrupt natural, routinized behaviors in social interactions and that these disruptions may themselves breed further anxiety (Pearson et al., 2008; Richeson & Shelton, 2007; Vorauer & Turpie, 2004).

While past research offers clues regarding the causes of interracial anxiety, this literature is largely composed of correlational studies testing the influence of racial attitudes and presentational concern separately (Dovidio et al., 1997; Plant, 2004; Shelton et al., 2010). Interpretation is complicated by the fact that prejudice and presentational concerns are theorized to operate nonindependently and may covary (Crandall & Eshleman, 2003; Richeson & Shelton, 2007). Additional empirical research is required to understand the roles of prejudice and presentational concern in causing interracial anxiety.

Alcohol and Self-Presentation

The impact of alcohol on interracial responding has bred interest among researchers and theorists studying intergroup relations. Crandall and Eshleman (2003) predict that alcohol consumption will decrease controlled self-monitoring, leading to increases in the expression of prejudice toward Blacks. Four empirical studies offer support for these predictions (Bartholow, Dickter, & Sestir, 2006; Bartholow, Henry, Lust, Saults, & Wood, 2012; Reeves & Nagoshi, 1993; Schlauch, Lang, Plant, Christensen, & Donohue, 2009). These studies indicate that the pharmacological effects of alcohol are associated with increases in race-biased errors on implicit associations tasks (Bartholow et al., 2006; 2012; Schlauch et al., 2009) and increased self-reported anxiety following exposure to a racially charged film clip (Reeves & Nagoshi, 1993). None of these studies examines behavior during interracial interactions, but instead examines behavior of participants in isolation responding to racial cues or "primes" (e.g., a black face on a screen).

We believe it is important to examine the impact of alcohol on behavior in a social or "interactive" context. Research employing interactive paradigms suggests that manipulations designed to deplete cognitive resources actually decrease the expression of racial bias among Whites, suggesting that prior findings linking alcohol to increases in racial prejudice may not generalize to an interactive framework (Mendes & Koslov, 2012). Indeed, research suggests that response to alcohol differs dramatically between subjects drinking in social settings and those drinking in isolation (del Porto & Masur, 1984; Doty & de Wit, 1995; Pliner & Cappell, 1974). Immediate, salient stimuli exert undue influence over the behavior of intoxicated individuals (Steele & Josephs, 1990) and, in the presence of such stimuli, intoxicated individuals can be induced to act in uncharacteristic ways (e.g., MacDonald, Fong, Zanna, & Martineau, 2000). Research examining alcohol's impact on racial attitudes has heretofore exposed participants to a single, immediate race cue. It is unclear whether such conditions mirror the complex social environments in which people typically drink and interact. Finally, research suggests that presentational concerns play a powerful role in determining affective and behavioral responding during interracial interactions. Such presentational concerns may not exert an equally strong influence on behavior among participants responding in isolation. An examination of alcohol's impact on displays of discomfort during interracial interactions may help determine the role of presentational concerns in interracial discomfort.

Alcohol is consumed across a broad range of social settings and represents a unique tool to examine the causes of interracial discomfort during social interactions. While alcohol is popularly believed to relieve stress, a large body of research indicates that the relationship between alcohol consumption and negative emotion varies depending on the source of discomfort (Sayette, 1993; Steele & Josephs, 1990). Relevant to the present study are findings indicating that alcohol reliably decreases negative emotions attributable to self-presentational concern (Hull, 1981, 1987). According to Hull's (1981) self-awareness model, alcohol pharmacologically reduces self-presentational discomfort by decreasing negative self-evaluation. If the source of anxiety extends beyond self-presentation, however, alcohol may in fact increase negative emotions. For example, when the direct cause of negative affect is present in the immediate environment, then discomfort can increase with alcohol consumption (Steele & Josephs, 1990). Furthermore, alcohol disinhibits the expression of feelings that are proscribed by societal norms (Hull, 1987; Steele & Josephs, 1990). Thus, if discomfort is caused by prejudice against a fellow conversant in an interaction, alcohol may increase both the experience and expression of discomfort (Reeves & Nagoshi, 1993). This study—the first to use an interracial social interaction to examine alcohol's effects—may help disentangle discomfort attributable to underlying prejudice from that attributable to presentational concern.

Emotion Measurement

An examination of the mechanisms supporting interracial anxiety presents methodological challenges related to the measurement of emotional experience. Indices of physiological arousal such as heart rate and galvanic skin response are lacking in emotional specificity. Self-reports require participants to aggregate

subjective experiences over time, impose language on what may be a nonverbal experience, and may be vulnerable to distortions caused by self-presentational constraints (Schwarz, 1999).

Social psychologists have recently called for research examining behavior directly (Baumeister, Vohs, & Funder, 2007), and advances in systems of measurement allow precise analysis of streams of ongoing behavior (Bakeman, 1999). Research suggests that facial behavior effectively captures emotional experiences (Ekman & Rosenberg, 1997). The present study is, to our knowledge, the first to use the Facial Action Coding System (FACS) (Ekman, Friesen, & Hager, 2002) to examine emotional displays during interracial interactions. FACS represents the most comprehensive system for coding observable facial muscle movements, referred to as Action Units (AUs; Ekman et al., 2002). While previous studies examining facial expressions during interracial interactions have asked coders to make subjective judgments about the nature of behaviors (e.g., friendly, see Dovidio, Hebl, Richeson, & Shelton, 2006), FACS instead provides an objective anatomically based facial coding system (Cohn & Ekman, 2005).

Although labor intensive, FACS offers enhanced specificity and precision in the measurement of nonverbal behavior compared to other systems. For example, measuring nonverbal behaviors using a judgment-based approach, Dovidio and colleagues (2002) suggested that automatic attitudes were evident in nonverbal displays. While most facial actions are now believed to reflect a combination of automatically activated emotion and controlled monitoring (Ekman, 1972; Hess, Banse, & Kappas, 1995), FACS allows researchers to differentiate those facial movements broadly associated with controlled processes from those more likely to be driven automatically. For example, FACS distinguishes "social smiles," involving the movement of only the muscles around the mouth, from Duchenne or "felt" smiles, involving the simultaneous contraction of both mouth and eye muscles. FACS enables the detection of "microexpressions," or expressions that appear on the face for less than a tenth of a second (Ekman & Rosenberg, 1997), and has proven to be a valuable tool for detecting the emotions of individuals motivated to keep these emotions hidden (Frank & Ekman, 1997). Finally, FACS has proven to be a powerful predictor of behavior, over and above self-reported affect and observer judgments (e.g., Archinard, Haynal-Reymond, & Heller, 2000; Ekman & Rosenberg, 1997; Gottman & Levenson, 2000).

Recently, applications of FACS have been expanded to enable measurement of subtler blended expressions related to emotions such as anxiety and discomfort. For instance, pressing or tightening of the lips has been associated with response to stressors (Levenson, 1987; Sayette, Smith, Breiner, & Wilson, 1992), and lip pressing and tightening observed together with a smile (termed "smile controls") are associated with discomfort attributable to controlled self-monitoring (Harris, 2001; Keltner, 1995; Keltner, Young, Heerey, Oemig, & Monarch, 1998; Reddy, 2000; Reed, Sayette, & Cohn, 2007). Most pertinent to the present study, smile controls are linked to embarrassment displays, or discomfort caused by negative self-evaluation following the violation of societal norms (Keltner, 1995).

In addition to smile controls, which involve multiple facial actions, we assessed interracial discomfort using content-free speech coding (Dabbs & Ruback, 1984, 1987). The relationship between speech latency (pauses) and anxiety is well documented, with longer speech latency being linked to state anxiety (Harrigan, Wilson, & Rosenthal, 2004; Siegman, 1987). Research and theory suggest that speech disfluencies and interruptions may be a defining characteristic of intergroup exchanges (Crandall & Eshleman, 2003; Vorauer, 2006; Word, Zanna, & Cooper, 1974). In our prior work, we have found pauses to provide a sensitive measure of discomfort across a range of populations (e.g., Zlochower & Cohn, 1996). In the present study, we use comprehensive, time-dependent coding of speech to investigate the role of pauses in interracial interactions.

The Current Study

We examined nonverbal displays of discomfort among Whites in majority-White interracial groups—a previously unstudied phenomenon. Despite the frequent occurrence of majority-White group settings in the U.S., research to date has focused on interracial dyads (Toosi, Babbitt, Ambady, & Sommers, 2012). Studies examining interracial groups have overwhelmingly emphasized the experience of "token" group members, or the individual whose social group is outnumbered in the exchange. This emphasis is partially attributable to research indicating that cognitive depletion measured following group interactions is more pronounced among "tokens" than those in the majority (Lord & Saenz, 1985). While research on "tokens" has produced valuable insights, study designs in this literature do not permit isolation of discomfort felt by those in the majority (Levine & Moreland, 1990). Even "subtle" manifestations of Whites' discomfort that "leak" through nonverbal channels negatively impact the experience of minorities and hurt race relations (Pearson et al., 2008; Word et al., 1974). Our microanalytical system of contemporaneous behavioral measurement provides the power to detect these subtle but important manifestations of interracial discomfort.

This study examined the behavior of Whites in an unstructured, lengthy (36-min) group exchange. Each three-person group consisted of two Whites interacting with a third group member who was either Black (interracial group) or White (all-White group). Our alcohol administration paradigm provided an ecologically valid tool to examine the extent to which interracial discomfort is attributable to presentational concern versus underlying racial prejudice.

Consistent with prior research, we predicted that, among sober participants, there would be more behavioral-expressive display of discomfort in interracial than all-White groups (Stephan & Stephan, 1985). Due to previously mentioned issues surrounding self-reported emotion measures, it was less clear that our self-report anxiety measure would produce a similar pattern of data (Schwarz, 1999). As suggested above, the impact of alcohol on behavioral-expressive display of discomfort should depend on the cause of interracial discomfort. If interracial discomfort were attributable to presentational concern, then alcohol should decrease displays of discomfort. If, however, this discomfort were attributable to underlying racial prejudice, then alcohol should increase displays of discomfort (Crandall & Eshleman, 2003; Hull, 1981; Steele & Josephs, 1990). Racial prejudice could also manifest through increases in other negative affective displays and decreases in smiling with alcohol consumption. Discomfort attributable to a combination of presentational concern and racial prejudice (Stephan & Stephan, 1985) would likely manifest as a weak or nonsignificant effect of alcohol on interracial discomfort.

Method

Participants

Participants were 138 individuals (90 female, 48 male) between the ages of 21 and 28 randomly assigned to 46 three-person groups. Participants were drawn from a parent study (Sayette, Creswell et al., 2012) examining the effect of alcohol consumption on social bonding. Half of the groups (23) contained one Black member and two White members; the 46 White members of these groups comprised the interracial group participants in the study. An additional 46 participants in 23 all-White groups were selected to match the White participants in interracial groups on gender and alcohol condition. Information from these 92 White participants is of primary interest in this study. However, the behaviors of the 46 Black or White "third group members" are accounted for in the analyses.

Groups were randomly assigned to alcohol (told alcohol, receive alcohol), placebo (told alcohol, receive no-alcohol), or control (told no-alcohol, receive no-alcohol) conditions. To eliminate potential confounds created by cross-gender dynamics, participants from only same-gender groups were included. The study thus employed a 3 (Beverage Condition) × 2 (Group Racial Composition) between-participants factorial design, generating the following conditions: Alcohol/All-White (n = 24), Alcohol/Interracial (n = 24), Placebo/All-White (n = 33), Placebo/Interracial (n = 33), Control/All-White (n = 12), Control/Interracial (n = 12). Participants were recruited via advertisements in local newspapers in the Pittsburgh area.

Procedure

Participants who answered advertisements were informed that the purpose of the study was to measure alcohol's impact on cognitive performance. When participants arrived in the lab, they were casually and individually introduced to confirm that they were not previously acquainted (see Kirchner, Sayette, Cohn, Moreland, & Levine, 2006). Participants then provided a breath sample to assess blood alcohol content (BAC) and completed a variety of self-report mood and personality assessments (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1970).

The three participants were then seated at equidistant intervals around a round table (75-cm diameter). Cameras were positioned in all four corners of the room, and a microphone recorded conversation. Participants were originally told that the cameras were being used to monitor their drink consumption and were later informed (see below) that the cameras also recorded facial expressions.

Participants in the alcohol and placebo conditions were informed that they would be receiving alcohol and that the dose would be less than the legal driving limit. Drinks were mixed in front of all study groups to increase credibility (Rohsenow & Marlatt, 1981). As we have done previously (e.g., Sayette, Martin, Perrott, Wertz, & Hufford, 2001), the alcoholic beverage was 1 part 100 proof vodka and 3.5 parts cranberry juice. In the placebo group, the glass was smeared with vodka, and a few drops of vodka were "floated" on the top of the beverage to enhance credibility. To adjust for gender effects, males in the alcohol condition were administered a .82g/kg dose of alcohol, while females were administered a .74g/kg dose (Sayette et al., 2001). To illustrate, a 170-lb man received the equivalent of about 7 oz of standard-issue 80 proof liquor, and a 130-lb female received 4.9 oz. Participants remained seated for a total of 36-min while beverages were administered in three equal parts at 0-min, 12-min, and 24-min. Participants were asked to drink their beverages evenly over the 12-min intervals and refrain from discussing how intoxicated they felt. Participants were otherwise not given instructions on whether to speak during the interaction period or what to talk about—participants were ostensibly seated in the same room to facilitate drink administration and communication with the experimenter.

Following drinking, participants' BAC levels were recorded, and they again completed the STAI-B and performed some additional cognitive tasks (see Sayette, Dimoff, Levine, Moreland, & Votruba-Drzal, 2012). After BAC was again assessed, Placebo and Control participants were debriefed, paid $50, and allowed to leave. Participants in the alcohol condition remained until their BAC levels dropped below .025%. Before leaving, participants were informed that their behavior had been videotaped, and their consent to analyze the data was solicited (all participants agreed).

Participants' facial expressions and speech during the drinking period were later coded by FACS-certified personnel using Observer Video-Pro software (Noldus Information Technology, 2010). The Observer system allows coders to time-stamp the start (onset) and stop (offset) of each AU to preserve the flow and synchrony of the interaction. Each frame (1/30th of a second) of the interaction was manually evaluated by coders for the presence or absence of relevant facial action units. All AUs were coded independently with the exception of AUs 23 and 24 (lip pressor and tightener), which were coded using the same identifier key. Video from each participant was independently coded so that the facial expressions of only one group member were visible to the coder at one time. Coders were blind to experimental condition.

Measures

Discomfort (facial). Smile controls—the presence of AUs that counteract the smile when seen together with the smile—were coded as the presence of AUs 23 (lip-tightener) or 24 (lip-pressor) coincident with AU 12 (lip-raiser) (see Figure 1).

(Speech). The largely sequential nature of speech allowed us to isolate that discomfort felt specifically in reference to the

Figure 1. Image of a study participant displaying a smile control. Participant shown in this figure consented to having her picture used.

interracial exchanges. We measured the average pause duration after the third group member spoke (a Black individual in interracial groups or a White individual in all-White groups) to index discomfort.

Self-reported anxiety. The STAI-B (Sayette et al., 2001), a 6-item version of the Spielberger et al. (1970) STAI-state, was used to measure reported anxiety.

Positive affect and smiling. Social smiles—associated with displayed rather than felt positive emotion—are defined as the movement of the zygomaticus major (AU 12) muscle. Smiles of enjoyment, or "Duchenne" smiles, include combined movement of the zygomaticus major (AU 12) and obicularis oculi muscles (AU 6) (Ambadar, Cohn, & Reed, 2009; Frank, Ekman, & Friesen, 1993).

Negative affect. Negative affect was defined as the appearance of any of the following Action Units (AUs): 9 (nose-wrinkle), 14 (dimpler), 15 (lip-corner-depress), or 20 (lip-stretch). These AUs correlate with disgust, contempt, sadness, and fear, respectively (Ekman, Freisen, & Ancoli, 1980).

Reliability of Measurement

Reliability coding for facial and speech data was assessed on a random subset of 72 participants from the parent study. There were good levels of agreement for positive affect (k = .88), negative affect (k = .73), and speech (k = .80). Reliability was moderate for the "smile control" (k < .47). When smile controls were broadened to encompass not only AUs 23 and 24 but also AUs 14 and 15, reliability improved (k = .65). However, research suggests that AUs 14 and 15 accompanied by a smile do not reliably identify uncomfortable participants (Keltner, 1995). Therefore, primary analyses were conducted examining AUs 23 and 24 together with AU12 as a smile control and then confirmed using the merged AUs with higher kappas.

Data Analyses

Data processing. Facial expressions and speech behavior were coded on a frame-by-frame basis for the entire 36-min session. Facial and speech data were coded continually, with the exception of 4 min while the experimenter refilled drinks (typically Minutes 11, 12, 23, and 24). Just over 7.9 million video frames of behavioral data were coded for this study.

Statistical modeling. Hierarchical linear modeling was used to account for the clustering of observations within participant (behavioral data) and the clustering of individuals within groups (Kenny, Kashy, & Cook, 2006). Because facial and speech production variables were not normally distributed, overdispersed hierarchical generalized linear modeling with Poisson-distributed errors was used to examine behavioral outcomes (Raudenbush & Bryk, 2002). In line with our previous research (Sayette, Creswell et al., 2012), negative emotional displays were examined as a composite measure. In order to test study hypotheses relevant to the pharmacological effect of alcohol (Hull, 1981; Steele & Josephs, 1990), Beverage Condition was represented as a complete orthogonal set of contrast codes, the first ("Alcohol") contrast comparing Alcohol to both Placebo and Control conditions and the second ("Placebo vs. Control") contrast comparing Placebo and Control conditions. Women in our study were more expressive than men, and gender was entered into behavioral models as a covariate. While the nonverbal behaviors of the "third group member" were not of primary interest as an outcome, we modeled the fully reciprocal nature of this interaction by entering these behaviors as a covariate in all models. [2,3]

Time. Our microanalysis of facial and speech behavior together with our protracted interaction period allowed us to conduct a rigorous examination of behavior over time during an interracial exchange. Behavioral responses to alcohol may emerge at varying points throughout a social exchange (Kirchner et al., 2006). We examined all main effects (Group Racial Composition, Beverage Condition) and interactions (Beverage Condition by Group Racial Composition) for stability across time during the interaction. If a significant interaction with time was observed, results of these main effects and interactions were reported specific to the portions of the interaction during which they appeared. Examination and interpretation of significant time interactions were achieved by means of centering the level-1 time variable. Only significant time interactions are reported. Units of time were represented in one minute bins.

Results

Beverage Manipulation Check

BACs and measures of subjective intoxication appear in Table 1. As expected, participants administered alcohol were on the ascending limb of the BAC curve, with BACs rising to an average level of .06% measured 40-min after the drink period.

Baseline Comparisons

Neither target participants nor third group members differed significantly on demographic characteristics or relevant baseline personality or mood assessments according to Group Racial Composition or the interaction of Alcohol[4] and Group Racial Composition (see Table 2).

Discomfort

Smile controls. Since smile controls were coded only in the presence of a smile, a variable reflecting the duration of smiling

[2] FACS data were not coded from minutes 3−10 for 80% of third group members. Due to the time-consuming nature of FACS coding and the large study sample, the parent study focused on minutes 13−36 of the interaction, or the portion of the interaction during which the impact of alcohol on behavior was predicted to be the most pronounced (Kirchner et al., 2006). Minutes 3−10 were therefore not coded for the majority of participants (80%) in the parent study. For the current study we did code these missing minutes for our target White participants since we felt these complete trajectories over time would be of interest to researchers studying intergroup relations. However, since HLM has excellent properties for accounting for missing data (Raudenbush & Bryk, 2002), we focused our coding efforts on target White participants. Third group members with missing data did not differ from those with complete data, $ps > .48$.

[3] The behaviors of third group members were accounted for in data analysis as a conservative measure. All significant results reported here reach significance regardless of the inclusion of this variable in the model, and effect sizes trend slightly larger when the variable is omitted.

[4] The Placebo vs. Control contrast was entered into all analyses reported in this article and produced no significant main effects or interactions. All reported results appear to reflect the pharmacological effect of alcohol (the contrast comparing alcohol to both Placebo and Control), rather than the influence of alcohol expectancy.

Table 1
Beverage Manipulation Check

Characteristic	Alcohol		Placebo		Control		
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	χ^2
BAC postdrink	0.051^a	0.013	0.001^b	0.001	0.001^b	0.001	109.62^{**}
BAC 40-min postdrink†	0.059^a	0.014	0.001^b	0.001	—	—	121.15^{**}
SIS postdrink	36.84^a	17.31	17.16^b	10.76	0.00^c	0.00	50.718^{**}
SIS 40-min postdrink†	31.06^a	16.96	11.59^b	13.95	—		21.622^{**}
Highest intox.	43.53^a	18.71	16.15^b	11.11	0.61^c	3.19	48.81^{**}
Vodka estimate	6.86^a	9.94	3.33^b	2.02	0.00^c	0.00	13.552^{*}

Note. BAC = blood alcohol concentration; SIS = subjective intoxication scale. SIS and Highest intox. were scored on scales ranging from 0 to 100. Groups with nonoverlapping superscripts differed significantly ($p < .05$).
† analyses did not include control participants as they were not asked to provide these data. $^{*}p = < .05$ $^{**}p = < .001$.

was entered into the model as a covariate. Participants consuming alcohol spent less time controlling their smiles than participants not consuming alcohol, $b = -0.83$, $t(42) = -4.250$, $p < .001$. The main effect of Group Racial Composition did not reach significance, $p = .128$.

Most germane to the present study, there was a significant Alcohol by Group Racial Composition interaction in predicting smile controls, $b = -0.78$, $t(41) = -2.062$, $p = .045$. In the nonalcohol conditions, Whites in interracial groups spent more time controlling their smiles ($M = 18.30$ seconds) than did those in all-White groups ($M = 11.18$ seconds), $b = 0.49$, $t(42) = 2.611$, $p = .012$. In contrast, among those Whites consuming alcohol, there was no significant difference in the duration of smile controls between those assigned to interracial ($M = 5.3$) versus all-White groups ($M = 7.1$), $p = .390$. The significant Alcohol by Group Racial Composition interaction was replicated for smile controls defined as AUs 14, 15, 23 or 24 together with a smile, $b = -0.69$, $t(42) = -2.107$, $p = .041$ (see section on reliability). In sum, differences in duration of smile controls between Whites assigned to interracial versus all-White groups consuming no-alcohol disappeared with alcohol consumption.

Pause duration. There was no significant main effect of Group Racial Composition on pause duration after the third group member spoke, $p = .365$. There was a significant Alcohol by time[5] interaction predicting pause duration, driven by a significant linear negative trend in pause duration among those consuming alcohol, $b = -0.021$, $t(41) = -2.135$, $p = .039$, which was not observed among those not consuming alcohol.

Of interest, there was a significant Group Racial Composition by Alcohol by Time 3-way interaction, $b = -0.045$, $t(41) = -2.274$, $p = .028$, driven by the significant negative linear trend in pause duration among those participants consuming alcohol in interracial groups, $b = -0.042$, $t(41) = -3.332$, $p = .002$ (see Figure 2). The Alcohol by Group Racial Composition interaction reached significance at approximately the halfway point in the 36-min interaction (between Minute 18 and Minute 19, $b = -0.90$, $t(41) = -2.032$, $p = .049$), and remained significant until the end of this period, $b = -1.57$, $t(41) = -2.497$, $p = .017$. Specifically, in the no-alcohol conditions, during the second half of the 36-min interaction White participants assigned to interracial groups took longer to respond after the Black group member spoke ($M = 4.4$ seconds) than did those assigned to all-White groups ($M = 2.7$ seconds), $b = 0.59$, $t(41) = 2.126$, $p = .040$. In contrast, among those consuming alcohol, the difference between interracial ($M = 0.89$ seconds) and all-White ($M = 2.4$ seconds) groups disappeared and trended toward reversal, $b = -0.98$, $t(41) = -1.750$, $p = .088$). In sum, differences in pause duration between Whites assigned to interracial versus all-White groups who did not consume alcohol disappeared across time among Whites who did consume alcohol.

Self-reported anxiety. There was no main effect of Group Racial Composition, no main effect of Alcohol, and no Alcohol by Group Racial Composition interaction in postinteraction self-reported anxiety, controlling for baseline anxiety, $ps > 0.188$.

Other Affect-Related Expressions

Positive affect and smiling. There was a significant Alcohol by Time interaction, $b = 0.020$, $t(42) = 3.497$, $p = .001$, driven by a significant negative linear trend in Duchenne smiling among those not assigned to receive alcohol, $b = -0.016$, $t(42) = -3.020$, $p = .004$. There was no significant main effect of Group Racial Composition and no Alcohol by Group Racial Composition interaction in Duchenne smiling, and no significant main effects or interactions in social smiling, $ps > 0.259$.

Negative affect. There were no significant main effects of Group Racial Composition or Alcohol and no Alcohol by Group Racial Composition interaction in the expression of AUs related to disgust, contempt, sadness, and fear, $ps > 0.197$.

Discussion

Using novel procedures and observational measures, this study aimed to clarify the emotional experience of Whites interacting in interracial groups. Specifically, we examined the impact of alcohol on nonverbal displays of discomfort among Whites in interracial versus all-White groups. Results indicated that alcohol consumption reduced facial and verbal displays of discomfort associated with interracial interactions. Among sober participants, those assigned to interracial groups showed significantly more smile controls than those assigned to all-White groups. Additionally, the pause duration after the Black group member spoke was significantly longer in the sober interracial groups than the pause dura-

[5] All time interactions refer to the linear effect of time. No quadratic trends reached significance.

Table 2
Baseline Demographic and Self-Report Group Comparisons

	Target participants				Third group members			
	Main effect race		Alcohol × Race		Main effect race		Alcohol × Race	
	b (SE)	*p*	*b* (SE)	*p*	*b* (SE)	*p*	*b* (SE)	*p*
Age	−.13 (.35)	.72	−.95 (.72)	.19	−.04 (.47)	.93	.26 (.99)	.80
% Single	−.34 (.57)	.56	.77 (1.18)	.52	−18.85 (8380.81)	.99	19.33 (22617.85)	.99
% Bachelor's degree	−.05 (.37)	.89	−.31 (.85)	.72	−.38 (3.75)	.92	1.07 (1.27)	.40
Baseline anxiety	−.04 (.15)	.81	.25 (.23)	.30	−.28 (.15)	.07	.04 (.32)	.90
Self-consciousness	.07 (.10)	.51	−.01 (.19)	.98	−.08 (.14)	.58	.35 (.29)	.23
Extraversion	.15 (1.5)	.92	−1.48 (2.99)	.62	−1.00 (1.81)	.58	−.38 (3.75)	.92

tion after a matched White group member spoke in all-White groups. Among intoxicated White participants there were no significant differences in smile controls or pause duration between interracial and all-White groups.

Theories addressing alcohol's impact on negative affect predict that alcohol will decrease discomfort attributable to presentational concern (Hull, 1981), but increase both the experience and the expression of negative affect associated with underlying racial prejudice (Hull, 1981; Reeves & Nagoshi, 1993; Steele & Josephs, 1990). Alcohol eliminated displays of interracial discomfort among participants in our study, suggesting that the negative emotions of Whites in the present interracial groups were attributable to presentational concerns. Research indicates that presentational concerns lead to anxiety when the self is judged to have difficulty performing adequately in a social situation (Hull, 1981; Schlenker & Leary, 1982). The smile control, a measure of discomfort employed in this study, has been associated with discomfort attributable to negative self-evaluation (Keltner, 1995). Thus, our study suggests that negative self-evaluation may at least partially underlie the link between presentational concerns and interracial discomfort.

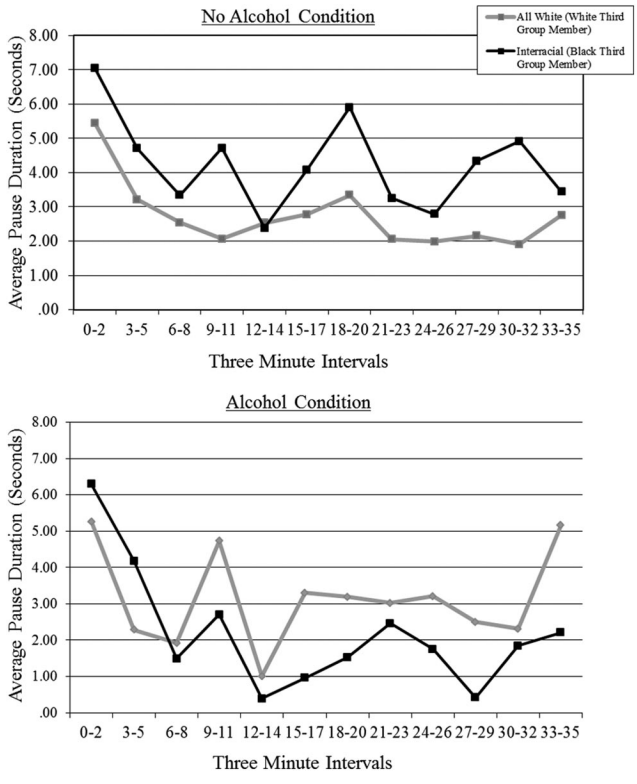

Figure 2. Pause duration after third group member speaks over time during interaction period.

Furthermore, our group paradigm and behavioral measures offer insights regarding mechanisms by which discomfort and anxiety might be maintained and exacerbated within interracial interactions. For example, behavioral manifestations of discomfort may themselves foster further negative affect by disrupting social and affective flow during interactions. In addition, lengthening pause duration in interracial dyads may foster discomfort and engender the perception that one's interaction partner is uninterested in the conversation (Pearson et al., 2008). And smile controls, which work to counteract the smile, may interrupt the experience of positive emotion (Reed et al., 2007). In sum, this study offers insight regarding those evaluative and behavioral mechanisms that may initially cause and then maintain discomfort during interracial interactions among some White individuals.

It is important to note that negative interracial emotions (typically associated with prejudice) were not evident in our sample, as indicated by the fact that Whites in our interracial groups were not more likely to express negative AUs linked to emotions such as disgust, contempt, or fear than those in all-White groups regardless of alcohol condition. Furthermore, contrary to suggestions of some research and theory, we found no evidence that positive affective displays in interracial groups are more likely to be insincere ("social smiles") (Crandall & Eshleman, 2003; Dovidio et al., 2002), and no evidence of differences in genuine or "Duchenne" smiling between Whites in interracial and all-White groups regardless of alcohol consumption. Thus, our findings using a group setting diverge from the findings of past studies exposing participants in isolation to "race cues" indicating that alcohol increases expressions of racial bias (Bartholow et al., 2006; Reeves & Nagoshi, 1993; Schlauch et al., 2009). Accordingly, our findings highlight the importance of interactive study designs in studying race relations (Hebl & Dovidio, 2005). As LaPiere (1934) noted, responses to "symbolic" outgroup members are based only on group membership, while responses to a "flesh-and-blood" member of that same social category may be determined by a wide variety of factors other than racial attitudes.

When combined with prior work linking presentational concern with interracial anxiety (Plant, 2004; Plant & Butz, 2006; Shelton et al., 2010), our findings may have implications for interventions designed to produce positive intergroup contact. They suggest, for example, that interventions that increase awareness of prejudice may have the negative consequence of heightening presentational concern (Richeson & Shelton, 2007), thereby generating discomfort. Richeson and Shelton (2007) instead recommend interventions fostering a "promotion" focus, in which Whites are encouraged to seek positive intercultural experiences.

It should be noted that our dependent measures of "discomfort" might also reflect controlled processing. Importantly, these perspectives need not be mutually exclusive, particularly in the context of a social interaction. Controlled processing may be stimulated by negative affect (Bartholow et al., 2012), and can be disruptive in the context of an interaction. Accordingly, research indicates that both smile controls and pauses reflect an aversive internal state (Harrigan et al., 2004; Keltner, 1995) and are likely to be disruptive (Pearson et al., 2008; Reed et al., 2007) during social exchange.

Some limitations of this experiment should be mentioned. First, like most studies examining interracial interactions, we examined only one racial contrast—between the affective experience of Whites in majority-White interracial groups and all-White groups. Using microanalytical behavioral-expressive measures, we illustrate that even in majority-White social settings, Whites show evidence of interracial discomfort. Future research should examine the affective experience of Blacks in majority-Black interracial groups and all-Black groups, as well as the experience of the "third" (opposite-race) member in both majority-White and majority-Black interracial groups. Second, this study used an experimental environment devoid of explicit racial content or racial threat (e.g., we did not include measures of racial prejudice or mention race throughout the experiment, and the interracial interaction was framed as incidental to drink administration). Future studies should test the generalizability of our findings to racially charged social exchanges. Third, our measures of facial affect did not allow us to determine the direction of the emotional display. Thus, we were unable to determine whether emotional displays of Whites in our three-person interracial groups were directed toward Black or White group members. Fourth, consistent with our prior work (Reed et al., 2007), this study did not distinguish between smile controls that follow Duchenne smiles and those that follow "social smiles." Finally, participants observed in this study were young and resided in a relatively diverse metropolitan area in the northeastern United States. It should be noted that two-factor theorists and those examining self-presentational concern have largely relied on samples of college students from similar geographical regions as in our study (e.g., Dovidio et al., 2002; Shelton et al., 2010). Nonetheless, it would be valuable to determine whether results of this study generalize to Whites in other age groups and those residing in other areas of the country.

In summary, this study used a novel experimental paradigm to assess the impact of alcohol on behaviorally expressed discomfort during intergroup interaction. Our results indicated that alcohol attenuated Whites' displays of interracial discomfort, highlighting the role of self-presentational concerns in negative intergroup emotions. In addition to shedding light on an important aspect of intergroup relations, the study demonstrates the utility of combining insights from multiple fields—in this case, alcohol administration research, social psychology, and emotion science—to better understand the effects of alcohol on social processes.

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