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Running Head: GLUCOSE AND PREJUDICE

Stereotypes and Prejudice in the Blood: Sucrose Drinks Reduce Prejudice and Stereotyping

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Abstract

Prejudice and stereotyping cause social problems and intergroup tension. The current work examined whether bolstering self-control by giving participants glucose would reduce stereotype use for an impression formation task. Previous work has demonstrated that self-control depends on biologically expensive brain processes that consume energy derived from glucose in the bloodstream. In the current study, glucose was manipulated via lemonade sweetened with either sugar or Splenda. Compared to the control group, the participants in the glucose condition used fewer stereotypes when writing an essay about a day in the life of a gay man. In addition, high-prejudice participants in the glucose condition used fewer derogatory statements in their essays than high-prejudice participants in the control condition. The findings are discussed in terms of the importance of self-control resources in the effective regulation of prejudice and stereotyping.

Stereotypes and Prejudice in the Blood: Sucrose Drinks Reduce Prejudice and Stereotyping

The expression of prejudice and use of stereotypes when forming impressions of others can produce serious interpersonal and social problems. Specifically, encountering a member of a stigmatized group causes many people to have stereotypes come to mind, but the expression of these stereotypes can be stifled with effortful self-control (e.g., Devine, 1989). Improving people's self-control resources may be one way to aid the effective control over the expression of prejudice and stereotyping. Recently, accumulating evidence has linked low blood glucose levels to impaired mental processes, negative interpersonal behavior, and poor self-control (Fairclough & Houston, 2004; Gailliot & Baumeister, in press; Gailliot et al., 2007). Controlling the expression of prejudice and the use of stereotypes requires self-regulatory energy and leads to the depletion of self-control resources that may impair cognitive functioning (Richeson & Trawalter, 2005). Because self-control depends on processes that consume glucose as an energy source, people who have lower levels of blood glucose may be more likely to express prejudice and use stereotypes compared to those with higher levels of blood glucose.

We hypothesized that increasing blood glucose levels with a drink sweetened with sucrose (because sucrose is converted into glucose) would increase self-regulatory energy, which should make people less likely to express prejudice compared to those in a control group. Indeed, a pilot study revealed that a sucrose drink reduced the tendency for White participants to erroneously "shoot" at unarmed Black suspects in a shooting simulation, whereas the drink did not significantly influence responses to armed Black suspects or (armed or unarmed) White suspects. Specifically, the current work examined the effect of glucose on the use of stereotypes and prejudiced statements when writing an essay about a day in the life of a gay man. Participants first consumed either a

sucrose drink or a drink with an artificial sweetener (e.g., control condition). Later, they wrote an essay about a gay man. We predicted that participants who consumed the sucrose drink would use fewer stereotypes about homosexuals in general and be less likely to use prejudicial remarks in their essays than participants in the control condition. Because people who are low in prejudice are less likely to use and rely upon stereotypes (Devine, 1989; Monteith, Spicer, & Tooman, 1998), we anticipated that the sucrose drink would reduce the expression of stereotypes and prejudice primarily among highly prejudiced participants. An alternative possibility was that the sucrose would have a larger effect on our low-prejudice participants because they would be more interested in controlling the use of stereotypes than the higher prejudiced participants. However, previous work has illustrated that low-prejudice people are unlikely to use stereotypes about homosexuals on such tasks even in conditions that tend to increase the use of stereotypes (i.e., after stereotype suppression; Monteith et al., 1998). Therefore, we anticipated that the low-prejudice participants would be unlikely to use stereotypes or express prejudice in either condition.

Method

Participants. Fifty-six undergraduates participated in exchange for course extra credit. Data from five participants were excluded from analyses either because they declined the glucose drink or because they failed to follow instructions before arriving at the lab, leaving a final sample of 51 undergraduates (25 women, 25 men, 1 unreported).

Procedure and Materials. Participants were told that the study was investigating factors related to food and personality. First, participants were given 14 ounces of lemonade sweetened with either sugar (sucrose condition) or Splenda, a sugar substitute (control condition). Sugar (i.e., sucrose) is a mixture of glucose and fructose, with the latter being broken down by the body into glucose. The sucrose drink contained approximately 140 Kcal. The placebo contained 0 Kcal. Both

the participants and the experimenter were blind to condition. Participants consumed the drink and then completed 3 measures of liking for the beverage (e.g., "How pleasant was it for you while drinking the beverage?") ($\alpha = .73$) that were embedded among other filler measures intended to bolster the cover story. Participants then completed filler questionnaires for approximately 12 minutes to allow the sucrose (if any) from the drink to be metabolized. At the end of the 12 minutes, participants completed the Brief Mood Introspection Scale (Mayer & Gaschke, 1988) as a measure of mood valence and arousal.

Next, participants were presented with a picture of Sammy, a young man who was said to be a homosexual. Participants were asked to write for 5 minutes about what Sammy does during a typical day. After the writing task, participants completed a questionnaire packet that contained a measure of explicit attitudes toward homosexuals, the Heterosexual Attitudes Toward Homosexuals scale (HATH; Larsen, Reed, & Hoffman, 1980) and the 33-item Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). The HATH was included to account for individual differences in the expression of stereotypes about homosexuality ($M = 2.35$, $SD = 1.03$). The Marlowe-Crowne was included to determine whether any effects of glucose levels on stereotypes may have been due to socially desirable responding. Participants also were asked to estimate the number of calories their drink contained. This served as a check to ensure that participants were unable to discern the difference between the sucrose and control beverages. To make sure that participants had at least some understanding of caloric content, participants were reminded that a can of soda contains approximately 140 calories. Finally, participants were thanked and debriefed.

Results and Discussion

Number of stereotypes used. To assess the number of stereotypes participants used in their essays about Sammy, independent judges (blind to condition) counted the number of times each participant mentioned any of 58 traits or characteristics associated with the stereotype of gay men (e.g., feminine, artistic) using a list developed in previous work (Gailliot, Plant, Butz, & Baumeister, 2007; Robinson, Montiel, Jakubowski, & Madon, 1996) (M = 2.35, SD = 1.03).

A regression analysis was conducted on the number of stereotypes with glucose condition, z-scored Hath scores, and their interaction as predictors. The analysis revealed a main effect of condition, such that participants in the sucrose condition used fewer stereotypes about homosexuals in their essays (M = 1.66, SD = 2.06) than did participants in the control condition (M = 2.97, SD = 2.06), t = 2.21, b = .65, < .05. Hence, people who consumed a sucrose beverage were less likely to use stereotypes when describing the typical day of a homosexual male than people who consumed the control beverage. As expected, the regression analysis revealed a main effect of HATH scores, b = .76, p < .05, such that people with low HATH scores (more negative bias toward homosexuals) included more stereotypes in their essays than people with high HATH scores. The interaction between sucrose condition and HATH scores did not approach significance.

Prejudice. Independent judges (blind to condition) counted the number of derogatory statements used to describe Sammy in the essay as a measure of prejudice (M = .78, SD = 1.11). A regression analysis revealed a significant interaction between sucrose condition and HATH scores, t = 2.24, b = .29, p < .05 (see Figure 1). Subsequent regression analyses indicated that among high-prejudice participants (i.e., those scoring 1 SD above the mean on the HATH), those who drank the sucrose beverage used fewer prejudicial statements in the written essay than those in the control condition, t = -2.47, b = -.46, p < .02. However, the sucrose beverage did not influence the number

of prejudicial statements used in the essay among low-prejudice participants (i.e., those scoring 1 SD below the mean on the HATH), $p = .48$.

Other factors. The obtained pattern of results were not influenced by mood valence, arousal, social desirability, taste preference for the beverages, estimations of the number of calories contained in the beverages, nor the length of participants' essays (assessed by the number of lines used on the essay page). The two conditions did not differ significantly on any of these variables and the previously reported key main effects and interactions in the regression analyses remained significant when controlling for all of these factors.

Together these findings suggest a link between glucose levels and the expression of prejudice and the use of stereotypes such that people with lower glucose levels are more likely to use stereotypes when describing others and, if they are high in prejudice, are more likely to make derogatory statements. These data are consistent with evidence that low levels of glucose impair self-control (Gailliot & Baumeister, in press; Gailliot et al., 2007). Further, the data are consistent with previous research demonstrating that controlling the expression of prejudice requires regulatory energy (Richeson & Shelton, 2003; Richeson & Trawalter, 2005; Richeson, Trawalter, & Shelton, 2005) or glucose (Gailliot et al., 2007). When people engage in the act of trying to control public expressions of prejudice or the use of stereotypes, they consume the energy required for self-regulation. However, once the energy source is restored to normal levels, people regain the ability to control conscious responses towards others. One could speculate that participants who received the control beverage may have had less cognitive energy available and, therefore, may have been less creative and relied more on heuristics when writing their essay compared to participants in the glucose condition. Future work should attempt to distinguish between these possibilities.

In the current work, the high-prejudice participants were less likely to use stereotypes in their essay and were less likely to make derogatory statements if they had consumed sugar compared to the control condition. One may wonder why the high-prejudice participants chose to exert control at all over the expression of prejudice. We suspect that most of our high-prejudice participants are aware that the expression of prejudice and use of stereotypes is socially inappropriate. In addition, increasing work highlights that even some high-prejudice people are motivated to respond without prejudice, if only to avoid social sanction (e.g., Plant & Devine, 1998). In contrast to our high-prejudice participants, our low-prejudice participants were less likely to use stereotypes across conditions and were highly unlikely to make derogatory statements across conditions. These findings are consistent with previous work demonstrating that people who are low in prejudice are less likely to rely upon stereotypes and make overt expressions of prejudice (e.g., Devine, 1989; Monteith, Spicer, & Tooman, 1998). It would be interesting in future work to explore whether glucose would influence the ability of low-prejudice people to control their expression of prejudice on measures that are more difficult to control or when their regulatory resources have been depleted.

Conclusion

The current work highlights the important role of self-regulatory resources for the successful control of prejudice and stereotyping. Ensuring that people have sufficient energy for self-control may help to improve their ability to control both the public expression of prejudice and use of stereotypes in their day-to-day life.

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Figure Caption

Figure 1. Effects of glucose drink condition and HATH scores on prejudicial statements.