Impact of Providing Drinkers With "Know Your Limit" Information on Drinking and Driving: A Field Experiment*

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ABSTRACT. Objective: Given that most effective alcohol harm-reduction laws specify the blood alcohol concentration (BAC) that constitutes illegal behavior (e.g., the .08% breath alcohol concentration legal limit), interventions that allow drinkers to accurately estimate their BACs, and thus better assess their risk, have potential importance to long-term driving-under-the-influence prevention efforts. This study describes a field experiment designed to test the impact on drinking of providing "Know Your Limit" (KYL) BAC estimation cards to individuals in a natural drinking environment. **Method:** We randomly sampled 1,215 U.S. residents as they entered Mexico for a night of drinking, interviewed them, and randomly assigned them to one of six experimental conditions. Participants were reinterviewed and breath-tested when they returned to the United States. The experimental conditions included providing generic warnings about drinking and driving, giving out gender-specific BAC calculator cards (KYL cards), and providing incentives to moderate their drinking. **Results:** Cueing participants about the risks of drunk driving resulted in significantly lower BACs (relative to control) for participants who indicated that they would drive home. Providing KYL matrixes did not reduce BACs, and, in fact, some evidence suggests that KYL cards undermined the effect of the warning. **Conclusions:** KYL information does not appear to be an effective tool for reducing drinking and driving. Implications for prevention and future research are discussed. (*J. Stud. Alcohol Drugs, 72,* 79-85, 2011)

ALCOHOL-RELATED DRIVING FATALITIES remain a serious public health problem. Alcohol-impaired driving accidents accounted for 32% of all traffic fatalities, representing more than 11,500 deaths in 2008 (National Highway Traffic Safety Administration [NHTSA], 2008). Young people accounted for about one third of those crashes and are at higher risk for crashes than older adults at any blood alcohol concentration (BAC; Zador et al., 2000). (Note that throughout this article, BAC indicates blood alcohol concentration as a concept, but breath alcohol concentration [BrAC] indicates blood alcohol concentrates estimated via breath samples and collected as part of the research.) The data on crashes have led to a renewed concern with impaired driving and the initiation of a NHTSA effort to promote new state media programs tied to enforcement programs directed at deterring drinking drivers. These media programs are most successful when they have local and immediate relevance to the community and where they can be delivered directly to the target group. An important target for such messages are young people who congregate to drink in unsupervised locations, such as fraternity houses, private homes when the parents are away, and remote deserts or beaches, where alcohol is free or free flowing and peer support for heavy drinking is strong (Clapp et al., 2002, 2009). Typically, these youths are difficult to target because they come from many locations and social groups and are brought together for brief periods in differing locations at unannounced times. Youth living along the U.S. border who cross into Mexico or Canada to drink provide such a target group (Clapp et al., 2001; Lange and Voas, 2001).

Prevention programs targeting young adults have used numerous environmental approaches, from media campaigns to law enforcement and combinations of the two (Clapp et al., 2006). Although broad, mass media approaches to the reduction of drinking often provide general information on alcohol risks, individuals may lack a method for reacting appropriately to the message content. This tends to be true of messages relating to laws setting an illegal BAC level, perhaps because individuals have no direct method to assess their own BAC levels. In response to this problem, some countermeasure programs attempt to make risks salient by providing drinkers with the tools to obtain more accurate estimates of their BAC levels (Royal, 2000). State driver's education classes and "Alcohol 101"–style programs offered to college students also teach BAC estimation by instructing young people how to associate alcohol symptoms to approximate BACs (e.g., Larsen and Kozar, 2005; Sharmer, 2001; www.centurycouncil.org/see-our-work/evaluation/alcohol101plus). This approach appears reasonable because many effective alcohol harm-reduction laws are specified in terms of BAC levels.

One method of providing such information is a graphic presentation of the relationship of gender, weight, and the number of drinks in a fixed period to the estimated BAC level of the drinker. This information can be presented on a wallet-size card typically called "Know Your Limit" (KYL)

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cards. KYL cards have been widely used for 40 years, correlating with the use of BAC tests to enforce impaired-driving laws. Surveys have demonstrated that the public has a poor understanding of the number of drinks required to reach illegal BAC levels and that those with high BACs tend to underestimate their BAC levels (e.g., Beirness et al., 1993). It follows that BAC estimation tools (such as KYL cards) could be useful in helping motorists regulate their drinking. The use of these tools, however, has been controversial; they might be misread and, consequently, mislead drinkers into consuming more rather than less alcohol before driving. Persons who otherwise might think fewer drinks were required to reach illegal BAC levels might be encouraged to drink more (Johnson and Voas, 2004; Johnson et al., 2008).

Method

Data for this study were collected using the portal survey method (Voas et al., 2006) at the San Ysidro border crossing between San Diego County, CA, and Tijuana, Mexico. Our previous research used the portal survey method at the same location to examine the drinking behaviors of young U.S. residents who cross into Tijuana to drink (Lange et al., 2006a) and to test experimentally several interventions designed to encourage the appropriate use of designated drivers (Lange et al., 2006b).

The study examined four research aims: (a) to determine the impact of warning drinkers about nearby police enforcement activity on alcohol consumption, (b) to determine the impact on alcohol consumption of adding a KYL card to the warning so that drinkers have a means of estimating their BACs, (c) to determine whether the effectiveness of providing drinkers with KYL cards is greater when participants are provided with instructions and asked to use the card during the evening, and (d) to determine whether KYL cards allow persons to better moderate their drinking under conditions where they are motivated to maintain a relatively low BAC.

Recruitment

The portal survey method involved a pseudorandom process of selecting and attempting to recruit naturally occurring peer groups as they approached the U.S.–Mexico border (from the U.S. side). In this study, two teams of three survey staff each worked at the border crossing. Whenever a survey team was not actively interviewing participants, one team member would approach the first individual to cross a preselected mark on the sidewalk as he or she headed south toward the border. This individual, along with each person in his or her peer group, was invited to take part in a research study on drinking and safety at the border.

Potential participants were offered $10 each for participating in the research, although in some conditions, participants could earn up to $20. Entire groups were solicited because our experience indicated that if group members were not invited to participate, they were unlikely to wait around for their friend. The recruited individual was therefore less likely to participate in the research. Not all persons in a group, however, were required to participate for some group members to take part in the study. Entire participant groups were assigned to one of six experimental conditions.

Entry into Mexico

After agreeing to participate in the research, all participants were given a clipboard containing the survey instrument and a pen. The survey instrument was administered on a custom-formatted optically scannable form that eliminated the need to hand enter survey responses. The survey instrument contained questions related to demographics (e.g., sex, age, race and ethnicity, student status), recent drinking history (e.g., on how many days in the past 4 weeks did they drink, number of times consuming five or more drinks in the past 2 weeks), transportation to the border (e.g., were they a driver or a passenger), and their drinking plans for the evening (e.g., did they plan to not drink, to get buzzed, to get drunk, or to get very drunk, and how important was it for them to reach their drinking goal). Young people who visit Tijuana bars and clubs rarely drive into Mexico to park. Rather, most park on the U.S. side of the border, where there is ample parking, and walk a quarter mile to the main strip of bars and clubs in Tijuana.

After participants completed the survey form, we gave them hospital-style identification bracelets so we could identify them on return and so that their entry data and exit data could later be linked. We asked participants to meet with the survey team upon their return between 1 A.M. and 5 A.M. to answer a few additional questions.

Finally, before crossing into Mexico, we requested an anonymous breath sample from all participants. Breath samples were collected and analyzed with calibrated Intoxilyzer SD400 preliminary breath-test units (CMI, Inc., Owensboro, KY) and used to produce estimates of blood alcohol concentration (BrAC). These breath-test units are of evidentiary quality and were programmed to record BrAC readings internally but not to display the BrACs. We used anonymous breath-testing procedures to help protect the rights of participants (who might, for example, be drinking although younger than age 21). The following day, the stored BAC data were downloaded and merged with the survey data.

Experimental instructions

Participants received instructions and KYL information according to which of the six experimental conditions their group was assigned. Figure 1 depicts the procedures that distinguish the six conditions.

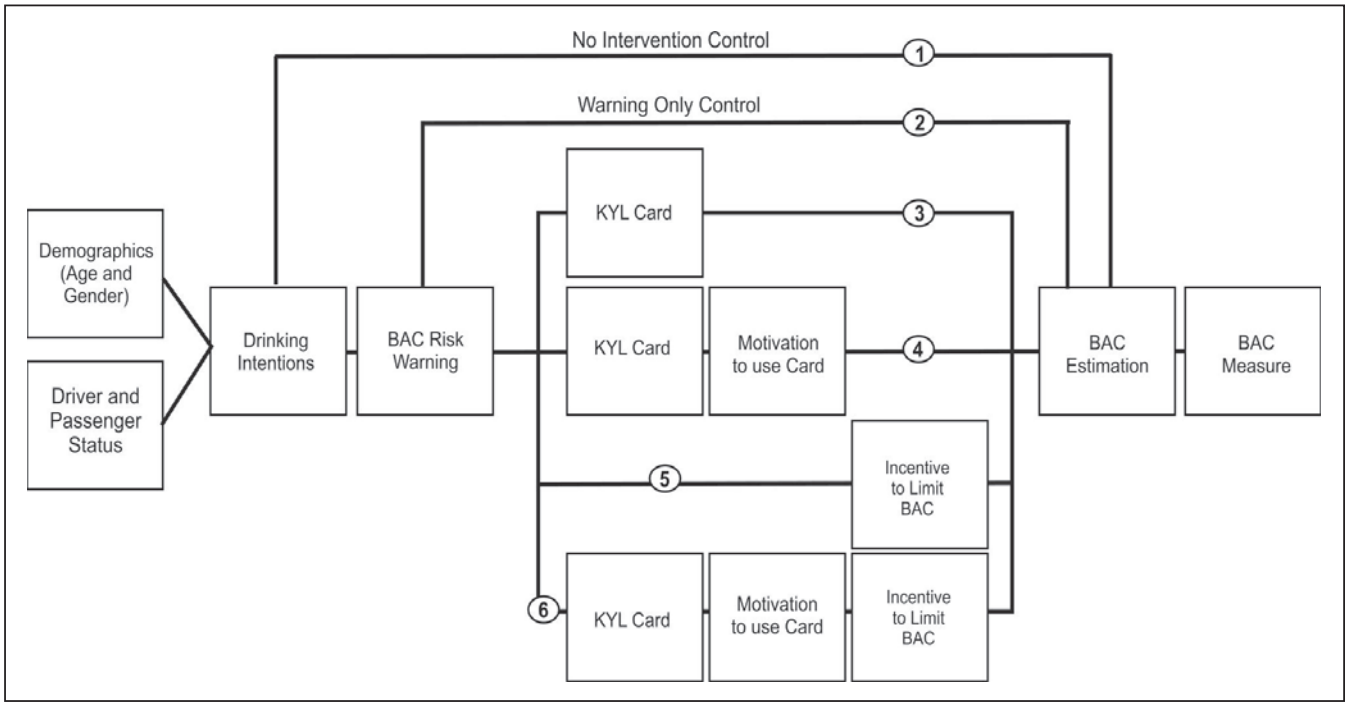

FIGURE 1. Model of experimental procedures. BAC = blood alcohol concentration; KYL = "Know Your Limit."

(1) *Control condition.* Participants in groups assigned to the control condition did not receive any interventions but were given the entry and exit surveys.

(2) *BAC warning condition.* Except for those assigned to the control condition, all participants received information about the drunk-driving enforcement operations being conducted in the San Diego area. The information cards warned participants that they could be arrested if they drove with BACs of .08% or higher and that consumption of any amount of alcohol would increase their impairment and risk of crash while driving. No additional information or KYL cards were provided.

(3) *KYL condition.* Participants in three of the treatment conditions, including the KYL condition (see Figure 1), were given information cards (see above) with the KYL matrix (gender specific) printed on the back of the card. These participants received the KYL cards without explicit instructions or training on how to use them.

(4) *KYL + instruction condition.* Each participant received the KYL cards, as well as explicit instructions on how to use them, and was instructed to use the card at least twice during the evening to estimate his or her BAC.

(5) *Motivation condition.* These participants received the warning about police activity but no KYL information (per Condition 3). However, these participants were also told that if they could limit their drinking while in Tijuana and return to the United States with a BAC of less than .05% (to be determined with a follow-up breath test), they would receive an *additional* $10 ($20 total). The purpose of this additional monetary incentive was to motivate drinkers to moderate their drinking behavior.

(6) *KYL + motivation condition.* In the sixth experimental condition, participants were offered the additional $10 incentive to limit their drinking and return with a BAC of less than .05%. These participants were also given a KYL matrix as well as the generic warning. Thus, participants in Condition 6 were given both a motive to control their drinking and a tool (the KYL matrix on the card) to help them estimate their BACs. To the extent that KYL matrices are beneficial for persons who are motivated to moderate their BACs to achieve their goal, we expected lower BACs (or a significantly higher proportion of BACs less than .05%) in this experimental condition.

Exit procedure

Participants were instructed to locate the survey staff stationed in the U.S. border crossing control facility between 1 A.M. and 5 A.M. Returning participants were given an oral interview, and their responses were recorded by the interviewer. The exit interview contained questions related to demographics; drinking behavior (e.g., number of drinks consumed and number of bars visited); transportation home (e.g., whether the participant would be a driver); and for Conditions 3, 4, and 6, whether they used the KYL card while in Tijuana.

After completing the interview, participants were asked to provide an exit BrAC sample. As in the entry survey,

participants' BrACs were not displayed but, rather, were stored internally in the breath-test units. In Conditions 5 and 6, however, participants were informed that they could earn an additional $10 if they returned with a BrAC less than .05%. For these conditions, the survey staff used an SD400 breath-test unit that recorded the BrAC internally but also displayed (yes or no) whether the BAC was .05% or higher. After providing a breath sample, each participant was given an incentive (a money order for either $10 or $20, depending on condition).

Sampling strategy and random assignment

Portal survey data collection occurred on 13 weekends (26 nights) between February 2005 and February 2006. In all, 387 participant groups took part in the research. A total of 1,125 participants completed both entry and exit portions of the survey, although only 1,075 provided valid BrAC readings at both entry and exit.

On a given night, only two of the six possible conditions were administered (because of the complexity of conducting experimental field research), and all members in a participant group were assigned at random to the same experimental condition. An attempt was made to balance the assignment of condition pairs to data-collection nights. Each experimental condition was administered on seven to nine survey nights.

Participant characteristics

Of the 1,215 participants, 51.8% were male, and the median age was 20, with 79.2% being younger than age 21. The sample consisted of 27.2% White (non-Hispanic), 9.3% Asian, 14.5% Black, 40.8% Hispanic, and 8.0% other. Slightly more than one quarter (29.2%) indicated that they were drivers.

Research hypotheses

We analyzed the data to test four specific hypotheses about the efficacy of KYL information as a tool for reducing drinking and driving. We hypothesized that providing a warning about the risks of drinking and driving would reduce BACs (particularly of drivers) relative to individuals who did not receive an explicit warning (Hypothesis 1). We hypothesized that providing KYL cards along with risk information should significantly reduce drinking (particularly for drivers) more so than providing risk information alone (Hypothesis 2). We hypothesized that providing instruction to use the KYL matrix should increase its use and reduce BACs (particularly for drivers) relative to those who receive KYL cards but are not instructed or trained on how to use them (Hypothesis 3). Finally, we hypothesized that providing drinkers (particularly drivers) with KYL cards (relative to not having KYL cards) would motivate participants to maintain relatively low BACs that would be reflected in their having significantly lower BACs on return (Hypothesis 4).

Analytic approach

Our research design involved complex sampling whereby individual participants served as our primary unit of analysis, but participant groups were our primary sampling unit. All analyses were conducted using generalized linear mixed modeling (PROC GLIMMIX in SAS Version 9.1 [SAS Institute Inc., Cary, NC]) with participant groups modeled as a random variable to accommodate this design. Our previous analyses of portal survey data (e.g., Lange et al., 2006a, 2006b) included participant groups as a random-effect variable in analyses.

Each set of analyses included participant demographics and drinking variables (gender, race, age, entry BrAC) as statistical controls; our primary variables of interest were driver status, an a priori contrast between two (or more) experimental conditions, and the interaction between driver status and the planned contrast. We did not conduct omnibus tests of the six-level experimental condition variable. Exit BrAC (controlling for entry BrAC) served as the primary dependent measure.

Results

A preliminary random-effects analysis determined that BrACs measured upon exit varied significantly as a function of participant group ($Z = 7.1$, $p < .01$, intraclass correlation coefficient [ICC] = .31), thereby necessitating the inclusion of participant group as a random variable in subsequent analyses.

Analyses of covariates

We conducted an initial series of analyses to predict exit BrAC from entry BrAC, gender, race, age, and self-reported driver status (returning home), and all two-way interactions involving these variables. Participant group was modeled as a random variable. Neither the two-way interactions nor age significantly predicted exit BrAC. However, gender, race, entry BAC, and driver status all predicted exit BrACs (all ps $< .01$). In general, men consumed more alcohol than did women (estimated mean exit BrACs of .047% and .040%, respectively); drivers consumed less than nondrivers (.038% vs. .050%); and Black participants consumed less than Asian, White, and Hispanic participants (.028% vs. .050%, .056%, and .045%, respectively, all contrast ps $< .01$). Entry BrACs were positively associated with exit BrACs.

Omnibus analyses

Before conducting tests of the four specific research hypotheses, in order to present a broader picture of the

Table 1. Model estimated breath alcohol concentration (BrAC) by condition and driver status

Variable	Drivers BrAC, %	Nondrivers BrAC, %
Control condition	.050	.044
Warning-only condition	.029	.050
KYL condition	.039	.050

Note: KYL = "Know Your Limit."

study results, we conducted an analysis that combined the six experimental conditions into three: a control condition (Condition 1), a BAC warning condition (Conditions 2 and 5), and a KYL condition (Conditions 3, 4, and 6). Our statistical model included participant group as a random variable, and participant demographics (along with entry BrAC) were included as covariates. We modeled driver status, the three-level experimental condition variable, and the Driver Status × Condition interaction on returning BrACs. The interaction was statistically significant, $F(2, 701) = 5.62$, $p < .01$. The patterns of estimated means, presented in Table 1, were subsequently tested.

Subsequent analyses revealed no statistically significant differences in returning BACs among the three experimental conditions for nondrivers (all ps > .21). For drivers, however, BrACs in the BAC warning condition were significantly lower than for those in the control condition ($p < .01$), although only marginally lower than the KYL condition ($p = .09$). There was no difference in the BrACs of drivers and nondrivers in the control condition ($p = .35$); however, BrACs for drivers were significantly lower than for nondrivers in both the BAC warning and the KYL conditions (both ps < .01).

Hypothesis 1

The first specific hypothesis concerned the effect on exit BrACs of providing participants with a generic warning about the risks of drinking and driving. We tested the main effect of driver status, the *planned contrast* between the control condition and BAC warning conditions (Condition 1 vs. 2), and the Driver Status × Contrast interaction. Our model included participant group as a random variable and entry BrAC, gender, race, and driver status as covariates. The contrast main effect was not statistically significant, but the Driver Status × Contrast interaction was statistically significant, $F(1, 695) = 11.0$, $p < .01$. In the control condition, the BrACs for drivers and nondrivers (.050% and .044%, respectively) did not differ significantly ($p = .36$), but in the warning condition, exit BrACs were significantly lower for drivers than nondrivers (.032% vs. .059%, respectively, $p < .01$). The BrACs of drivers significantly *decreased* in the BAC warning condition, whereas the BrACs of nondrivers significantly *increased* in the BAC warning condition.

Hypothesis 2

The second hypothesis concerned the effect on exit BrACs of providing KYL information. The test of this hypothesis examined driver status, the contrast between the BAC warning condition and the warning + KYL condition (Condition 2 vs. 3), and the Driver Status × Contrast interaction. Participant group was included as a random variable, and participant demographics and entry BrAC were included as covariates. Neither the contrast main effect nor the Driver Status × Contrast interaction ($p = .08$) was statistically significant. The trends of this marginal effect were not consistent with our predictions.

Hypothesis 3

The third hypothesis concerned the effect of providing participants with instruction and training on how to use the KYL information. This hypothesis involved multiple tests. First, we wanted to see whether participants in the KYL + instruction condition used the KYL card more than participants in the KYL condition did (based on the self-report measures at exit). The analysis examined driver status, the contrast between Conditions 3 and 4, and the Driver Status × Contrast interaction. The dependent measure was binary (self-reported use vs. no use of the KYL card), and the analyses controlled for participant demographics, entry BrAC, and participant group. This analysis revealed a statistically significant Condition × Driver Status interaction, $F(1, 236) = 5.08$, $p < .01$, whereby drivers who received instruction to use the KYL matrix were significantly more likely to have done so (estimated proportion = .80) than those who were given KYL cards but did not receive instructions to use them during the night (proportion = .45), $p < .01$. The difference in proportion of nondrivers who used the KYL cards was not statistically significant (.56 vs. .47, respectively), $p = .24$.

We then tested the effect of providing the KYL cards with instruction to (a) the BAC warning condition (no KYL information) and (b) the KYL condition (with no instruction). Thus, one series of analyses modeled the interaction between driver status and contrast between Conditions 2 and 4, and a second series modeled the interaction between driver status and Conditions 3 and 4 (see Figure 1 for a diagram of experimental conditions). Neither the contrast main effect nor the Driver Status × Contrast interaction approached statistical significance.

Not all participants reported using the KYL cards (even those in the KYL + instruction condition), which might explain why we failed to detect differences in exit BrACs between the two experimental conditions. To more directly test the effect of providing drinkers with KYL information, we recoded participants in the KYL and KYL + instruction conditions in two groups: "Did Use the KYL matrix" and "Did Not Use the KYL matrix." The contrast between these

two groups, however, did not significantly interact with driver status in predicting BACs ($p = .26$), nor was the main effect of this contrast statistically significant ($p = .36$).

Hypothesis 4

The fourth hypothesis concerned whether KYL information could facilitate the drinkers' ability to control their alcohol consumption under conditions where they had been motivated to do so. This required a series of analyses. First, we tested the effect of our motivation manipulation (e.g., offering a $10 incentive to return with a low BAC) by contrasting mean BACs of participants in motivation condition (Condition 5) to the BAC warning condition. Here, we found BACs of nondrivers were significantly lower in the motivation condition than the BAC warning condition (.044% vs. .059%, $p < .05$) but observed no significant differences in BACs between the two groups of drivers (.032 vs. .027, $p = .58$). Presumably, drivers already are motivated, on average, to maintain a relatively low BAC and thus are less affected by the motivational manipulation. These results suggest that, at least for nondrivers, the additional $10 incentive served as an adequate motivation for participants to regulate their drinking.

To test the efficacy of providing KYL information to persons who are motivated to maintain low BACs, we contrasted the BrACs in the motivation condition with those in the KYL + motivation condition (Condition 5 vs. 6). Relatively lower BrACs in the KYL + motivation condition would suggest that the KYL information helped motivate participants to regulate their drinking. However, neither the interaction contrast ($p = .40$) nor the main effect contrast ($p = .38$) was statistically significant.

We then replicated the previous analysis (using the same model) but this time predicting the likelihood (dichotomous) of participants returning with BrACs of .05% or higher (given that the incentive instruction was specifically linked to that level). We limited the analyses to only those participants (in the KYL + motivation condition) who reported actually using the KYL card. Under incentive ($10) to maintain a relatively low BrAC but without receiving KYL information, drivers were significantly less likely to return with high BrACs (.05% or higher) than were nondrivers (proportions = .18 vs. .41, respectively), $F(1, 626) = 7.88$, $p < .01$. No significant difference was observed when individuals were given an incentive plus KYL information (proportions = .40 vs. .50, $p = .33$). Importantly, the proportion of drivers returning with relatively high BrACs in the motivation condition was significantly lower than the proportion in the motivation + KYL condition, $F(1, 626) = 4.47$, $p < .05$.

Discussion

This experimental study examined the ability of KYL information to impact drinking behavior among young adults. In general, providing drinkers with KYL information—from which they could estimate their BACs—did not play a role in reducing drinking behavior. For nondrivers, pairing KYL information with a general warning about drinking and driving risks clearly failed to reduce BrACs more than did the general warning alone, and marginal trends suggest that the KYL information *might* have increased consumption. This potential increase in drinking due to KYL information deserves further investigation.

When we examined whether providing KYL information helped drinkers regulate their consumption under conditions where they were incentivized to drink moderately, a significantly larger proportion of drivers returned with BrACs higher than .05% when they were given a generic warning plus KYL information relative to when they were given a generic warning alone. Although further research is necessary to corroborate these findings, our study found that under these experimental conditions, providing drivers with KYL information hindered their ability to regulate their alcohol consumption.

These findings are contradictory to what we predicted and appeared inconsistent with the goal of reducing drinking by drivers. Why would giving drinkers BrAC information contribute to higher drinking—particularly among drivers who are motivated, presumably, to maintain ostensibly safe drinking levels? Although research (e.g., Beirness et al., 1993) suggests that drinkers are poor at estimating their BAC levels, this research shows that drinkers still understand the *relative* relationship between alcohol consumption and BAC. Drinkers who plan to drive and who want to reduce their risks know that simply drinking less can facilitate this goal. Indeed, given a clear incentive to moderate their drinking, a large proportion (estimated 81%) of drivers returned with BrACs lower than .05% without being provided with any tools for BAC estimation. For many drinkers, motivation alone was sufficient to achieve the goal.

Previous research suggests that some BAC estimation tools (e.g., saliva-based alcohol test strips) reduce drinkers' ability to accurately assess their alcohol impairment (e.g., Johnson et al., 2008), perhaps by interfering with their attention to their own physiological cues. In this study, where we actually examined the effect on drinking behavior, it is plausible that drinkers in the KYL conditions used the KYL cards to maximize their drinking up to some ostensibly "safe" level. Drinkers who did not have KYL information, rather than targeting their drinking to a specific BAC, simply relied on a strategy of gross reductions in drinking. Potentially, then, providing drinkers with BAC estimation information enabled them to attempt to target their drinking toward a specific BAC, yet the lack of precision of the estimates led some to overshoot their target.

Why, then, did the KYL information affect the drinking behavior of only drivers and not significantly influence the drinking of nondrivers? The warning provided to participants

along with the KYL information pertained exclusively to drinking-and-driving risk. Nothing increased the salience of risks associated with alcohol consumption in general. Without BAC-specific risks for nondrivers, there was little incentive for them to use the KYL information.

One final noteworthy finding was the result that simply warning individuals about the risks of drinking and driving was sufficient to reduce BrACs of drivers. This warning, however, also appeared to increase the BrACs of nondrivers. Presumably, the warning motivated the participant groups to clarify designated-driver roles, which may have "liberated" nondriving drinkers to consume more. This finding replicates results from a prior portal survey on drinking and driving (Lange et al., 2006b).

Field research on two different approaches of BAC estimation (the current report and Johnson et al., 2008) suggests at least some iatrogenic effects associated with using personal BAC estimation products as drinking-and-driving countermeasures. It is unclear whether personal alcohol tests are widely used, but intervention strategists should be cautious about implementing programs that revolve around these tools. The research also calls into question the utility of teaching students how to associate symptoms to BACs. Although there is no evidence that this information, typically presented in didactic format, is harmful, the evidence suggests there is a greater likelihood of it increasing drinking-and-driving risk rather than reducing it.

At face value, the argument seems reasonable that providing drinkers with methods for estimating BACs—via education or personal testing tools—makes them more responsible and facilitates their making more informed decisions about driving. Yet this argument assumes that the drinkers are appropriately motivated to use this information to reduce their risks. However, if potential drivers are strongly motivated to avoid the risks associated with drinking and driving, BAC estimation tools are not necessary. Our research shows that motivated drinkers can and do reduce their alcohol consumption, even when they lack BAC information. It appears that BAC estimation tools may be most useful for individuals who wish not simply to minimize their risk but who try to maintain their drinking while keeping BACs under some prescribed level.

Although teaching drivers to estimate BAC levels prior to driving may be ineffective at best, legal BAC limits for driving remain an effective public health and safety mechanism. The research presented here suggests that brief field interventions that remind drivers of enforcement activities and legal risks associated with driving under the influence can be effective. These are complementary approaches. Further research might address how such warnings can be coupled with designated-driver interventions and larger environmental prevention campaigns in a comprehensive approach to driving under the influence.

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