The ability to 'hold one's liquor' indicates risk of developing alcohol problems

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Prior studies have shown that a low subjective response (SR) to alcohol is a risk factor for alcohol use disorders (AUDs). Research on moderate drinkers has shown that acquired tolerance is different from initial response, and is also significantly associated with drinking problems. A new study of linkages among early SR, acquired tolerance, alcohol use, and alcohol-related problems among problem drinkers has found that a low, early subjective response –an ability to "hold one's liquor" - may protect against problems in the short term, but likely becomes a risk factor for longer-term problems as tolerance to alcohol develops.

Results will be published in the March 2013 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"People who feel less impaired after drinking are at increased risk for developing AUDs," said William R. Corbin, associate professor and director of clinical training in the department of psychology at Arizona State University. "A low SR to alcohol may result from differences in drinking history. For example, with heavier drinking, tolerance develops whereby individuals feel less intoxicated than they used to at the same level of consumption. Tolerance is a well-established correlate of alcohol problems and is one of the diagnostic criteria for alcohol dependence. Because studies of SR must be conducted with individuals of legal drinking age, 21 years or older, participants typically already have considerable drinking experience, making it difficult to determine if differences in SR are due to innate individual differences or differences in the acquisition of tolerance." Corbin is also corresponding author for

the study.

"This study helps clarify how responses to the pharmacological effects of alcohol are related to subsequent alcohol use and problems," added Lara A. Ray, assistant professor in the department of psychology at the University of California, Los Angeles. "It's important to remember that subjective response precedes the development of alcohol problems, while acquired tolerance is a symptom in itself."

"Our study is only the second to try to differentiate between innate differences in SR and tolerance, and understand their unique relations with drinking behavior and alcohol problems," said Corbin. "The prior study sample was comprised of relatively light drinkers, while the current study examined the unique role of initial SR and tolerance in a sample of heavy drinking young adults."

Corbin and his colleagues examined associations between early subjective response and acquired tolerance, and both drinking behavior and alcohol-related problems, within a sample of 113 heavy drinking young adults (75 men, 38 women) who had volunteered for a clinical trial of naltrexone in combination with brief motivational counseling.

"Consistent with the one prior study on this topic, we found that both initial SR and tolerance were related to drinking behavior, with heavier drinking among those with a low initial SR and greater acquired tolerance," said Corbin. "In direct contrast with the prior study, a low initial SR was associated with fewer alcohol-related problems in this heavy-drinking sample, and tolerance was not a significant predictor of problems."

"While the literature suggests that a low subjective response is always a risk factor," noted Ray, "the main issue is what kind of subjective response is being measured."

"The participants in our sample were young heavy drinkers who had not yet passed through the peak period of risk for AUDs," said Corbin. "We speculate that protection against alcohol-related problems among young heavy drinkers with a low SR may allow them to continue to drink more heavily as they miss the 'stop' signal to cease drinking. A continued escalation in heavy drinking may ultimately contribute to an increased risk for AUDs."

Corbin said this study provides further evidence for differential roles of initial SR and acquired tolerance. "Whereas both were associated with drinking behavior, only initial SR was related to AUDs among heavy drinkers with considerable acquired tolerance," he said. "This finding highlights the importance of assessing both initial SR and tolerance and suggests that the relation between initial SR and alcohol problems may change over the course of an individual's drinking history. A low initial SR may contribute to heavier drinking and more related problems early in an individual's drinking history and prior to the development of substantial tolerance. However, our findings suggest that, as tolerance develops, the combination of an initially low SR and tolerance may protect against acute alcohol problems."

"It is important to point out that subjective responses vary and a refined understanding of what responses are being measured is warranted," said Ray. "In this study, the responses measured are primarily sedative and unpleasant, hence playing a stronger protective role in individuals who have negative responses to alcohol. However, and as noted by the authors, this sample is characterized by heavy drinkers who may differ in terms of their genetic make up and predisposition to problem drinking."

"From a public health perspective, we need to disseminate information about patterns of SR that are associated with long-term risk for AUDs," added Corbin. "Although a low SR may protect against problems in the

short term, it is a well-established risk factor for long-term problems with alcohol. Unfortunately, the prevailing belief in the general public is that people who are able to 'hold their liquor' are at lower risk. In fact, these are the individuals most at risk, particularly when accompanied by other risk factors such as a family history of alcoholism."

"This study also suggests that tolerance is a stronger marker of problems in heavy-drinking populations," said Ray, "and should be evaluated routinely within youth."

"In addition," said Corbin, "there is evidence that individuals at increased risk for alcohol problems, such as heavy drinkers and those with a positive family history of alcoholism, experience a heightened stimulant response to alcohol in addition to a blunted response to more negative impairing effects. Thus, efforts to inform the public about high-risk patterns of response to alcohol should highlight the importance of individual differences in both the more positive stimulant effects and the more negative impairing effects."

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