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Decision Making and Alcohol: Health Policy Implications

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Abstract

Many negative outcomes associated with alcohol consumption stem from individual decision making, such as the decision whether or not to drive after drinking. Understanding biases in decision making as they relate to alcohol, and measuring variability in decision strategies across individuals, can be a tool for improving policy. For alcohol-related policy, both addiction and the acute effects of intoxication are potential sources of bias or heterogeneity in decision strategy, and we provide a brief primer on how they can affect decision making. We then discuss two alcohol policy domains, alcohol impaired driving and excessive consumption. We review potential implications of major findings in decision making research for each of these domains, and point out how policy could take account of biases and variability in decision making.

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How people make decisions about alcohol can have implications for policy. Policies aimed at reducing alcohol-related harms need to take account of variability in individual decision making, and the impact of addiction and intoxication on choice behavior

Keywords

Alcohol Intoxication; Decision Making; Risk; Health Policy

Many negative behaviors associated with alcohol consumption involve human decision making. For example, an individual may decide whether to drive home after a night of heavy drinking, endangering themselves and others. Or, what would ordinarily be perceived as a minor insult could be considered a major transgression by an intoxicated individual, leading to the decision to start a fight. An unambiguous message of “no interest” for sexual behavior could be mis-interpreted, or ignored outright, by an intoxicated person resulting in the decision to engage in sexual assault. Of course, individuals also decide whether to consume alcohol or abstain; for those who choose to drink, the decision of how much and how often to do so involves weighing the costs (e.g., time, money, health risks) against any perceived benefits of consumption.

Over-consumption of alcohol and alcohol-induced impairment are associated with substantial negative outcomes that have motivated a range of public policies aimed at reducing these outcomes and their associated costs (e.g., Voas & Fell, 2016). Alcohol is an

addictive drug, and the progression of addiction itself can have profound effects on individual responsiveness to alcohol policies (Chaloupka et al., 2002). Finally, the acute effects of alcohol produce pharmacological changes that can alter decision making processes (Davis-Stober et al., 2018; van Rensvwaaij, Dutilh, & Wagenmakers, 2012).

Understanding individual differences in decision making processes can benefit policy development in general, and specific examples related to alcohol policies and intoxicated decision making. This is not to say that traditional, econometric models used in policy development have not been useful or effective -- far from it. Rather, we argue that investigating individual differences in decision processes, and how alcohol addiction and intoxication can alter these processes, can illuminate why an alcohol-related policy is only partially effective and could point the way to future improvements.

As a concrete example of how ignoring differences in risky decision making can lead to sub-optimal policy outcomes, consider a population of older adults making healthcare decisions. Substantial research suggests that older adults tend to examine fewer choice attributes when evaluating complex alternatives, are less consistent in their choices, and tend to use simpler choice strategies as compared to younger adults (e.g., Mata et al., 2007). Older adults pay more attention to premiums than to out-of-pocket costs when evaluating healthcare plans and outright ignore variance-reducing aspects of different plans (i.e., they select riskier plans than necessary; Abaluck & Gruber, 2011). Reportedly, overall economic welfare would have been 27% higher if all individuals had rationally selected healthcare plans. This suggests that any effective policy for improving healthcare decisions must be sensitive to decision making differences in older adults.

Similar to this healthcare example, understanding heterogeneity in decision making as it relates to alcohol is beneficial. We consider two major areas of policy: 1) policies against driving while impaired by alcohol and 2) policies that aim to reduce excessive consumption. We discuss existing policies and suggest ways in which future directions for policy might benefit from decision making research.

Alcohol and Decision Making

Both addiction and intoxication can impact the decision making process. Many of the decisions that are the ultimate targets of alcohol policies are either made by intoxicated individuals (e.g., driving, continued consumption) or by individuals with an alcohol use disorder. Below, we provide a brief primer on mechanisms by which addiction and intoxication alter decision making.

Addiction

While even a modest review of the literature is beyond the scope of this paper, we briefly summarize existing research on two essential decision making constructs as they relate to addiction. Temporal discounting refers to a decrease in reward value of a commodity as a function of the delay in its receipt (Ainslie, 1975). For example, a person might take a small short-term gain (the momentary pleasure of drinking) over a larger delayed one (maintaining good health). Substantial evidence suggests that temporal discounting is disrupted in

addiction, and may be a behavioral marker of addiction (Bickel, Koffarnus, Moody, & Wilson, 2014). Discounting of rewards is not necessarily specific to temporal delay. For instance, individuals with addiction may also be more likely to discount the value of a probabilistic reward (probable but not guaranteed health) relative to a certain one (reliable pleasure), though this association is less robust (Bickel et al., 2014). Disrupted temporal discounting may facilitate addiction by encouraging an individual to consume alcohol now at the expense of the future rewards of sobriety (e.g., lack of negative consequences).

Demand for alcohol is defined as the relationship between alcohol consumption and its cost; demand represents another index of dysfunctional decision making in addiction (Koffarnus & Kaplan, 2018). Behavioral economic theory suggests that excessive alcohol consumption occurs because alcohol is over-valued relative to other commodities also perceived as rewarding. Demand is assessed by the amount of money an individual is willing to pay for alcoholic beverages (Murphy & MacKillop, 2006). So, for example, a person who abuses alcohol might be willing to spend the grocery budget on it, overvaluing the alcohol, relative to food. Higher levels of demand are present in individuals with alcohol use disorder and correlate with the severity of alcohol dependence (MacKillop et al., 2010). Elevated demand may also encourage addiction through price (in)sensitivity. Consistent with this, individuals who consume larger amounts of alcohol are less price sensitive than moderate drinkers (Meier, Purshouse, & Brennan, 2010).

Alcohol Intoxication

Alcohol intoxication can also acutely alter cognitive abilities relevant to decision making. Again, the literature on acute intoxication effects is too broad to summarize here. We focus on alcohol's effect on attentional processes as an example mechanism by which acute alcohol intoxication affects decision making. The alcohol myopia model (Steele & Josephs, 1990) describes how alcohol intoxication might impair cognitive processing of attentional cues; the intoxicated person allocates attention in such a way that promotes alcohol consumption and interferes with effective decision making. In the context of this model, myopia refers to the notion that alcohol consumption enhances an individual's focus on the most salient, easy-to-process cues, limiting the ability to attend simultaneously to competing cues that would inhibit problematic behavior.

For example, alcohol-related aggression fits the alcohol myopia framework (Giancola, Josephs, Parrott, & Duke, 2010). Provocative cues might include an urge to retaliate, and inhibitory cues might include the negative consequences of choosing to retaliate. When intoxicated, the inhibitory cues are less salient and therefore attract less attention resulting in an increased likelihood of aggressive behavior. Other behaviors (e.g., risky sexual behavior, alcohol impaired driving) also fit the alcohol myopia model (LaBrie, Kenney, Mirza, & Lac, 2011).

Alcohol Impaired Driving Policies

Driving after consumption of alcohol is one of the most prevalent and high-risk consequences of alcohol use. An estimated 28.7 million U.S. adults report driving after drinking per year (Substance Abuse and Mental Health Services Administration, 2014), and

29% of fatal traffic accidents involve alcohol (National Highway Traffic Safety Administration [NHTSA], 2018). As a result, alcohol impaired driving (AID) has been a frequent target of legal and policy efforts. Legal prohibitions against driving while intoxicated by alcohol began almost concurrently with the widespread use of motor vehicles, with the first U.S. laws passed in 1910. From 1910 to 1980, states experimented with a range of policies designed to discourage driving while impaired by alcohol and to reduce alcohol-related motor vehicle crashes.

Starting in the 1980s, the federal government backed two major policies designed to reduce alcohol impaired driving - increasing the minimum legal drinking age (MLDA) to 21 and a per se standard (Blood Alcohol Concentration (BAC) of .10 and later .08) for defining intoxication while operating a vehicle. These policies have been remarkably successful. Reviews of the literature (e.g., Wagenaar & Toomey, 2002) suggest an inverse relationship between MLDA and both alcohol consumption and crash risk for underage drinkers. For per se laws—that is, defining impairment by BAC, not behavior—similar reviews (Tippetts, Voas, Fell, & Nichols, 2005) indicate that both the introduction of per se standards and the strengthening of those standards (e.g., to .08 BAC in the U.S.) have substantially reduced alcohol-related crashes.

Though the empirical evidence strongly supports the beneficial effect of these policies, they did not occur in a vacuum. Changes in public awareness of and attitudes about AID changed considerably during this period. Mothers Against Drunk Driving (MADD) was founded in 1980 and launched numerous public awareness campaigns against AID, considered highly effective. Now, overall attitudes towards AID are overwhelmingly negative (Drew et al., 2010). The interplay between policy effectiveness and public awareness programs is also synergistic: MADD was instrumental in pushing the federal government to implement both the MLDA and per se laws, and changing public attitudes toward AID throughout the 1980s facilitated reducing the per se standard from .10 to .08 in the early 1990s.

Despite the past 30 years of success for this multi-pronged effort, AID behavior and crash-risk have “stabilized” at a lower, but still unacceptable level (>10,000 fatalities per year in the U.S.). Why does this behavior persist at all, in the face of clear and otherwise effective policy and enforcement, and despite near-universal recognition of AID as a significant public health threat? While considerable social science research has improved our understanding of potential contributors to AID, it has not led to successful changes in AID policy or prevention efforts in the past 15 years (although offender treatment has improved, e.g., South Dakota 24/7 Sobriety program; Kilmer, Nicosia, Heaton, & Midgette, 2013).

Behavioral economics research in the field of addiction has focused primarily on models of choice with direct implications for use, such as behavioral economic demand for a substance or differences in delay discounting as a function of use. However, recent studies have suggested that both delay discounting and demand for alcohol have potential implications beyond consumption, and may have independent implications for decisions about driving after drinking. Individuals with steeper discounting curves (dramatically valuing immediate rewards and devaluing comparable future rewards) are more likely to report AID, even after accounting for consumption and other personality traits (e.g., impulsivity; Rossow, 2008). In

addition to greater discounting, impaired drivers also demonstrate less prior planning for drinking events (e.g., appointing a designated driver; Sloan, Eldred, & Xu, 2014).

A similar pattern appears for behavioral economic demand for alcohol and AID. College students who drive after drinking show elevated demand for alcohol, even after accounting for differences in drinking (e.g., Amlung et al., 2016). Another study (Teeters & Murphy, 2015) manipulated the environmental contingencies associated with drinking and measured demand for alcohol, without contingencies, as well as in a hypothetical scenario where individuals expected to drive one hour after they stopped drinking. Although all participants reduced demand for alcohol in the driving scenario, those who reported recent AID were less affected by the contingency manipulation: They reduced demand less than those who did not report AID.

Taken together, these studies suggest that the decision to drive after drinking might be influenced by biases or individual differences in inter-temporal choice, reinforcement (reward) efficacy for alcohol, and sensitivity to contingencies associated with consumption. As Sloan et al. (2014)'s results also demonstrate, awareness of existing policies does not appear to be a contributing factor; in fact, those who chose to drive after drinking alcohol were actually more knowledgeable about the relevant legal standards and penalties for AID than others. Thus, alcohol pricing policies, such as taxation and limits on happy hour policies, could have unique effects on the decision to drive after drinking, independent of their direct effect on consumption.

In addition to the biases indicated by differences in these behavioral economic variables, another method of probing AID decision making is by examining how individuals decide to drive (or not) after consumption. How do individuals evaluate the trade-offs between relevant factors, such as risk (of accident or arrest), cost, and time, when deciding whether to drive or take a ride (e.g., taxi) after consuming alcohol? Only a handful of experimental studies have examined this aspect of AID decision making, for example: probing this process by manipulating decision-relevant information, including situational cues (inhibited and impelling cues; MacDonald, Zanna, & Fong, 1995) and the availability of risk information (Johnson & Kopetz, 2017). A set of studies to explore the AID decision making process illustrate the potential for decision making research to impact both our scientific understanding of AID behavior and policy targeting AID (McCarthy & Davis-Stober, 2018). These studies tested whether: 1) choice behavior relevant to AID conformed to a consistent decision making strategy; 2) if so, are decision making strategies heterogenous, either across individuals or situations, and 3) if so, is this heterogeneity associated with the likelihood of engaging in real-world AID, and what are the implications of this association?

These studies developed hypothetical scenarios where participants chose between driving and a safe ride alternative (e.g., taxi), across a range of alcohol consumption levels. The costs (in either money or time) of the safe alternatives were systematically varied. Analysis tested whether individuals' choice patterns could be classified into one of two general strategy types (using a hierarchical Bayesian model for inferring two step changes; Lee, 2018): 1) a compensatory ("rational") strategy, where the choice between AID and the safe alternative integrated all choice factors (e.g., number of drinks, cost of rides, time difference

between riding and driving), or 2) a non-compensatory (“heuristic”) strategy, where the probability of choosing is based on a simple rule, ignoring some aspects of the decision for some choices. Multiple samples found that the majority (> 80%) of participants’ choice behavior could be clearly classified into one of these two overall strategies.

Those who employed a rational strategy on the task were more likely to report recent AID behavior. Although at first seemingly counter-intuitive – AID does not seem to result from rational processes – the finding made sense after probing what the use of each strategy entails. Those who use the rational strategy are considering both their current alcohol consumption and the cost of a safe alternative in all decisions – put another way, even when they have consumed a large amount of alcohol, they are still factoring in ride cost in their decision of whether to drive. Alternatively, a closer look at the heuristic strategy users indicated that the “rule” most had adopted was that they would ignore ride costs when their consumption hit a specific level. Once we understood this, the fact that rational strategy users were more likely to engage in AID made perfect sense.

This type of research has potential implications relevant to AID policy: One reason for the success of current AID policy and prevention efforts is that they have encouraged a rule-based decision making approach to AID. A per se legal limit (.08 BAC) establishes a rule (“bright line test”) for driving after drinking. Individuals who use a heuristic strategy can be thought of as trying to estimate their current intoxication to determine whether they are above or below this line. Although heuristic use reduces likelihood of AID, it does not eliminate risk of AID. Some individuals may use an inadequate rule - for example, by setting too high a threshold for their impairment. For these individuals, current policy may be sufficient, and their AID behavior might be reduced through prevention or information efforts that encourage the use of better rules.

What about the rational decision makers? These individuals may not have responded to existing policy by adopting a bright line test – even at high levels of consumption, they still consider other factors in deciding whether to drive. Policies such as the per se laws have apparently not altered these individuals’ choice behavior. This may mean that additional, similar policies, or harsher versions of existing policies (per se at .05 BAC), may likewise not change the strategy these individuals use in their AID decisions. If some individuals will always consider all information when making this decision, then they may be more responsive to policies that change the information, or the trade-offs among them. This type of utility maximization calculation is implicit in AID prevention efforts that emphasize safe alternatives to AID by increasing availability (free safe transport on college campuses) or decreasing the costs. It is also the rationale behind Uber’s partnership with MADD, with a goal of reducing AID incidents by decreasing barriers to safe rides. Policies and prevention efforts that address these trade-offs can reduce AID behavior in this group.

Excessive Consumption Policies

Heavy or excessive consumption of alcohol is a major health risk. Data are very clear that even occasional heavy consumption can produce negative health effects. Binge drinking (defined as 4 drinks for females or 5 for males over hours) is associated with negative health

outcomes, including liver disease, heart problems, and cancer. Extremely heavy consumption can lead to acute health problems and even death from alcohol poisoning. In addition to direct health impacts, heavy drinking episodes are also linked with increased risk of addiction to alcohol and to risky or problem behaviors, including accidents, traffic crashes, etc.

As a result, the U.S. has instituted policies designed to curtail excessive consumption, including alcohol pricing, taxation, advertising, distribution, and sales. Many of these policies, such as increased taxes (e.g., Elder et al., 2010), are explicitly based on standard assumptions that increased pricing, or decreased supply, will reduce consumption consistent with classic economic theory. While many of these policies have had significant salutary effects, their effectiveness varies as a function of individual difference characteristics, including level of alcohol consumption (Chaloupka et al., 2002; Meier et al., 2010). An additional, unexplored limitation in the effectiveness of these policies is the degree of heterogeneity in decision making processes among individuals. This heterogeneity can arise from either a natural individual difference in decision making strategy, or be due to the chronic (addiction) or acute (intoxication) effects of alcohol.

Differences in temporal discounting may be one source of heterogeneity that influences policy effectiveness: Individuals with alcohol use disorder are more likely to discount the value of future rewards (e.g., Bickel et al., 2014). The effects of acute alcohol intoxication on temporal discounting are less clear, given several empirical demonstrations that discounting is not changed by acute intoxication (Ortner, MacDonald, & Olmstead, 2003). As a result, excessive consumption policies may differ in effectiveness as a function of individual differences in trait-like temporal discounting. Existing behavioral economic interventions for reducing alcohol use suggest that alternative rewards that do not involve alcohol are effective at changing behavior (Yurasek, Dennhardt, & Murphy, 2015). One possible method to increase policy effectiveness would be to increase the salience and availability of other non-alcohol-related options.

Similarly, biases or changes in behavioral economic demand for alcohol can alter or limit the effectiveness of policy. For example, taxation policies that attempt to reduce heavy consumption by increasing the cost of alcoholic beverages may be less effective for individuals with high demand for alcohol, as these individuals are willing to pay more for alcoholic beverages. As noted, individuals who are addicted to, or dependent on, a substance, including alcohol, exhibit more demand for the product (MacKillop et al., 2010). This suggests that the likely primary targets of policies to reduce excessive consumption might be less responsive to increases in price, or require a higher level of increase before reducing consumption.

Also, significant within-person heterogeneity in demand for alcohol may occur, and demand may change as a function of contextual factors, including intoxication. Increases in demand for alcohol followed an intoxicating dose of alcohol, and demand later dropped steadily as BAC declined (Amlung et al., 2015). This suggests that one mechanism by which “drink specials” lead to excessive consumption is by temporarily reducing price, which then returns to normal once patrons have consumed alcohol and exhibit higher demand for alcohol (i.e.,

are willing to pay higher prices for the same drink). Half-price drink specials are associated with increased demand, even after adjusting for differences in cost (Kaplan & Reed, 2018).

Taken together, these findings suggest the potential for policies aimed at reducing or eliminating drink specials may impact excessive consumption. What is less understood is the decision making process individuals use when deciding how much alcohol to drink. Planned excessive consumption, and drinking more than intended, are two distinct decision making processes, and only the latter involves decision making during the drinking episode. *The Diagnostic and Statistical Manual of Mental Disorders (DSM)-5* (American Psychiatric Association, 2013) defines exceeding a set limit (“drinking more, or for longer, than intended”) as one symptom of alcohol use disorder. Experiments test how variability in the acute effects of alcohol predict excessive consumption. For example, individuals who exhibit greater behavioral disinhibition (Weafer & Fillmore, 2008) or experience heightened stimulation from alcohol (Boyd & Corbin, 2018) consume more alcohol when given the opportunity.

No studies to date have explored the decision making strategy used to evaluate trade-offs when choosing whether to drink more or adhere to a set limit. Such studies could evaluate how individuals weigh the various costs and benefits of additional consumption, including both immediate (e.g., price, time, “fun”) and longer term (e.g., risk of hangover, reduced sleep, long-term health costs). This process could also be evaluated at different levels of consumption (e.g., drinking more after already consuming a varying number of drinks). Similar to the AID strategy studies noted earlier, it is unclear, a priori, whether a rational or a heuristic decision process may result in “better” decisions, i.e., lower drinking. A rational strategy might limit drinking by encouraging individuals to stop consumption based on integrating the full range of costs/benefits, whereas a heuristic process may indicate clear “limit setting,” resulting in not exceeding a standard amount under any circumstances. Alternatively, a heuristic decision maker may only attend to immediate rewards (fun with friends) and ignore consequences, both short-term (hangovers the next day) and long-term (eventual liver damage), and therefore engage in more drinking.

Regardless of which strategy is associated with heavier consumption, these types of decision makers would respond differently to specific policies. Policies that target rational decision processes would focus on increasing the real or perceived cost and reducing the (real or perceived) benefits of heavy consumption. Alternatively, heuristic decision making may be more affected by policies aimed directly at the rule or heuristic upon which their decision is based, and by definition may be non-responsive to policies that target aspects of the decision that are not included in this rule. Developing such policies would require identifying not just whether some individuals use heuristics for a specific decision, but also what information they are and are not using. In the case of excessive consumption, a heuristic user who focuses only on time or cost associated with drinking more might be most affected by policies restricting venue hours (requiring bars to close earlier) or drink specials. Further research needs to determine whether and how individuals vary in their decision making about consumption.

Future Directions: Cannabis and Driving

The need to examine addiction-relevant policy with sensitivity to heterogeneity in decision making processes is certainly not limited to alcohol, or to the issues discussed here. One critical future direction for substance-related policy development is cannabis. Setting aside the legal complexities of federal vs. state regulation of cannabis, the number of U.S. states permitting medicinal and recreational cannabis is large and growing. As with alcohol, these states are developing their own regulatory structures and policies to govern the sale, distribution, marketing, and restrictions on cannabis use. Although most states already have laws against driving while impaired by any substance, states that have legalized medical or recreational cannabis use need to provide clear policies defining cannabis-impaired driving. Such policies, as with AID policies, need to balance the permissible use of cannabis with the need to prevent impaired driving harms.

Many states have tried to adapt effective AID policies to cannabis impaired driving, for example setting a per se limit of 5 micrograms of blood THC. However, the pharmacology of the two drugs is quite different, and blood THC levels do not track with current impairment in a linear fashion in the way blood alcohol concentration does (Huestis, Henningfield, & Cone, 1992). A per se limit may therefore not provide the same type of bright line test for cannabis impairment as it does for alcohol; some individuals may be impaired without meeting this standard, while others who have no current impairment may exceed it. In addition, the perceived risks of cannabis-impaired driving are much lower than for AID (McCarthy, Lynch, & Pederson, 2007), and the cannabis-related crash risk may in fact be lower than alcohol (Movig et al., 2004), but still significant enough to require prohibition. Better understanding of effective cannabis policy will improve with better understanding of individual level decision making about cannabis and related risks.

Conclusion

To summarize, policy needs to reflect the heterogeneity of decision makers. As discussed, standard econometric approaches to measuring utility and decision behavior has led to highly effective policy. Yet, while such policies impact many decision makers, many individuals continue to make dangerous and risky decisions under these policies. We need to understand how these individuals are weighing risky alternatives, and then formulate additional policy to target them specifically.

This basic point is not new. Many prominent scholars have questioned the assumption that all individuals are utility maximizers who consider all relevant choice information when making a decision (e.g., McFadden, 2001). Omitted heterogeneity in decision making behavior can severely bias the results of a study, which can lead to ineffective health policy. For example, incorrectly assuming that all individuals consider all choice options when making a decision can bias measures of economic welfare impact by 30–50% within a common framework (Li, Adamowicz, & Swait, 2015).

In the United States, most alcohol policies are implemented at the state level, although in some states municipalities can implement alcohol-relevant policies (e.g., venue operating

hours). Decision making research can provide a roadmap for alcohol policy to target different groups of decision makers, and to target individuals particularly at risk. For example, according to the Alcohol Policy Information System (APIS: <https://alcoholpolicy.niaaa.nih.gov>), 17 states currently have no specific policies regulating or restricting drink specials, and many others have policies that target only a single aspect of such specials (e.g., no free beverage specials). The research we reviewed on alcohol demand suggests that not only might such regulations be effective, but they potentially target segments of the population at greatest risk for excessive consumption. States and municipalities (particularly those with heavy drinking subpopulations), can benefit from implementing multiple policies that limit various methods for reducing alcohol purchase costs.

As demand biases are also associated with AID engagement, such policies might also affect this behavior. Policies that target AID heuristic decision makers should focus on “improving” the decision rule these individuals use. An example of this type of prevention effort is the “Buzzed driving is drunk driving” campaign by NHTSA (www.buzzeddriving.org). In contrast, policies to target rational decision makers should focus on decreasing or eliminating barriers to safe alternatives to AID. If such policies are designed to reduce time-related barriers to these alternatives, they may also address delay discounting biases exhibited by those at high risk for AID. While such efforts can be more cost-intensive, they may be targeted at individuals most at risk for AID.

We of course acknowledge that the link between policy and decision making is not one to one. Any given policy has many “downstream” implications, which may ultimately influence the decision maker in unintended ways. For example, the effectiveness of the .08 per se law may be partially due to changes in police practices and court system responses, rather than direct changes in decision makers’ evaluation of the policy. Future decision making research might show that a specific policy change is effective for heuristic users (for example, individuals setting a drink limit beyond which it is not safe to drive), but ineffective on utility maximizers (for example, where the decision to drive trades off between current intoxication and cost of alternatives). This does not necessarily imply that the policy produced this change directly in the decision maker; it could well be mediated by changes in police or legal system behavior in response to the policy.

Regardless, decision-making research has much to offer alcohol policy analysis. The key recommendation we offer is that multiple policy types are needed to research multiple “types” of decision makers. By specifically targeting those individuals who do not respond to current regulations, we have a better chance of reducing negative outcomes related to alcohol, which, in turn, would pay dividends in reduced costs on society and healthcare.

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Highlights

- Alcohol-related harms result, in part, from how individuals evaluate related risks.
- Individuals differ a lot in how they make risky alcohol-related decisions.
- The heterogeneity can also be a function of addiction and acute alcohol intoxication
- Alcohol policy that accounts for biases in decision making and variability in choice behavior can be more effective in reducing alcohol-related negative behaviors and their associated costs to society and human health.