Turning Down the Heat on Adolescent Substance Use

Findings from Reframing Research

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A FrameWorks Research Report

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Why does adolescent substance use need a new frame?

While many voices are engaged in public discussion about substance use these days, the importance of preventing use among young people too easily falls out of the conversation. While advocates and pundits debate the legalization of marijuana and treatments for opioid use—legitimate issues that certainly warrant our attention—too little attention is paid to prevention and early intervention for adolescents, and too little focus is placed on public health approaches that can keep young people from developing substance use problems in the first place.

As we have argued in previous reports, this failure is grounded in the American public's deep assumptions about adolescents and substance use. Because experimentation with alcohol and drugs is widely assumed to be natural, prevention is too often seen as unrealistic and early intervention as unnecessary. People tend to see alcohol and other drug use as a social issue and have a hard time recognizing that it is also a health issue. Because people generally don't understand the ways in which substance use impacts healthy development, they tend to assume that it is best handled by parents, teachers, or supportive peers, and typically don't see the value of a public health approach that draws on the expertise and capacity of primary care providers.[1]

To develop a way of framing adolescent substance use capable of addressing misconceptions and moving the issue into the center of our public conversation, the FrameWorks Institute has engaged in mixed-method empirical research, supported by grants from the Conrad N. Hilton Foundation. Using Strategic Frame Analysis®, we have arrived at reliable, research-based recommendations for reframing the issue.

This report outlines the findings from a series of interrelated investigations aimed at identifying framing tools and techniques capable of elevating the public discussion. The purpose of this report is to allow communicators to review the evidence base behind the recommendations emerging from this project. It is our hope that this transparent approach to the research, its methods, and its findings will allow advocates to trust the recommended reframing techniques, adopt them, and share them with like-minded colleagues. You won't find a catchy slogan here, but you will find insights that will help you build public understanding and generate more support for evidence-based approaches to reducing adolescent substance use.

What does reframing need to accomplish?

This report presents findings from the second, prescriptive phase of our research process, in which we developed framing tools and strategies to expand public understanding of adolescent substance use, cultivate productive attitudes toward the issue, and increase support for evidence-based programs and policies. This research builds on our earlier, descriptive research, in which we mapped the gaps between expert and public thinking on the issue and examined how the issue was being talked about within news media and by advocates.

At the beginning of this second phase of research, we identified a set of reframing "tasks" based on the communications challenges identified in the first phase of research. This set of tasks served as a to-do list for researchers as we developed reframing tools and strategies. We set out to develop communications strategies capable of accomplishing the following goals:

1. Cultivate understanding of adolescent substance use as a health issue and promote recognition of the critical role of health care providers in addressing the issue.
2. Generate a deeper understanding of how *protective factors* mitigate the escalation of substance use among adolescents.
3. Help the public understand that serious adolescent substance use can have long-term effects on brain development.
4. Foster a sense of collective responsibility for addressing the problem of adolescent substance use.
5. Foster a sense of collective efficacy—the idea that we, as a society, can in fact reduce adolescent substance use.
6. Build support for policies and programs that prevent or address adolescent substance use by promoting protective factors and creating environmental supports, including within health care settings.

To develop and test framing strategies capable of accomplishing these tasks, FrameWorks researchers used a series of methods drawn from Strategic Frame Analysis. Below, we outline these methods and then present findings from this research, identifying framing strategies and tools that are capable of accomplishing each of the above tasks. We present key evidence from qualitative and quantitative research in support of these findings and interpret results to offer insight into why these framing strategies work and how they should be used to accomplish the above tasks.

How did we identify effective frames?

To systematically identify effective ways of talking about adolescent substance use, FrameWorks researchers developed a wide range of potential messages and tested them with ordinary Americans. These methods are described briefly below. For a fuller description, see Appendix A.

Frame Development

After specifying the reframing tasks outlined above, FrameWorks researchers brainstormed potential reframing strategies and tools that, we hypothesized, might accomplish one or more of these tasks. After generating a list of candidate reframes to test, researchers solicited feedback on these reframes from the Hilton Foundation and a panel of experts to ensure that the frames were both apt and usable for those working in the field. Based on this feedback, researchers chose a set of frames to bring into empirical testing and refined the wording and presentation of these frames.

On-the-Street Interviews

The first method for empirically testing the potential frames was on-the-street interviews. We conducted 66 total interviews in Philadelphia, Pennsylvania, and Charleston, South Carolina, in April 2017. In these one-on-one interviews, we tested six explanatory metaphors, two analogies comparing adolescent substance use to other health issues, and a message on the value of preventive screening. These interviews are an exploratory method that helped us understand how these frames affect the ways that people think and talk about adolescent substance use.

Survey Experiments

The second method for empirical frame testing was a set of three online survey experiments, conducted in September and October 2017. They included 5,900 respondents.

The first two experiments used a common design. For these experiments, demographic quotas were used to render the sample representative of the American public. In each of these experiments, respondents were randomly assigned to a message treatment or a null control. After reading the message (or, in the null control group, no message), respondents were asked a series of questions designed to measure attitudes toward adolescent substance use, understandings of how the issue works, and support for evidence-based policies and interventions. Each battery consisted of multiple questions. The batteries are

listed in the table below, along with sample questions from each battery. See Appendix B for the full set of survey questions.

BATTERY	SAMPLE SURVEY QUESTION
Understanding of Adolescent Substance Use as a Health Issue	In your view, how much of a role should each of the following groups play in dealing with adolescents' use of alcohol and other drugs? *[Randomize order of groups; 7-point Likert scale: No role at all; A very small role; A small role; A moderate role; A large role; A very large role; An extremely large role.]* Groups asked about included "Primary care doctors and nurses" and "Psychiatrists, clinical psychologists, and counselors."
Collective Responsibility	In your view, how much of an obligation does our society have to do something about adolescents' use of alcohol and other drugs? *[7-point Likert scale: No obligation at all; A very small obligation; A small obligation; A moderate obligation; A large obligation; A very large obligation; An extremely large obligation.]*
Collective Efficacy	How optimistic or pessimistic do you feel that our society can reduce adolescents' use of alcohol and other drugs? *[7-point Likert scale: Extremely pessimistic; Pessimistic; Somewhat pessimistic; Neither optimistic nor pessimistic; Somewhat optimistic; Optimistic; Extremely optimistic.]*
Understanding of Protective Factors	In your view, how much of an impact does each of the following have on whether or not an adolescent will develop problems with alcohol and other drugs? *[Randomize order of factors; 7-point Likert scale: No impact at all; A very small impact; A small impact; A moderate impact; A large impact; A very large impact; An extremely large impact.]* Participants were asked about a range of factors, such as "Having a health care provider who gives them information about alcohol and other drug use," "Living in a community that limits advertising for alcohol," and "Living in a community with strong resources (e.g., high-quality housing, health care, schools)."
Understanding of Effects of Substance Use	In your view, when adolescents regularly use alcohol and other drugs, how long do its effects on each of the following last? *[Randomize order of effects; 7-point Likert scale: Just as long as it is in their system; A very short amount of time; A short amount of time; A moderate amount of time; A long amount of time; A very long amount of time; An extremely long amount of time.]* Participants were asked about a range of effects, including effects on "Brain health, or the structure and functioning of the brain," "Academic achievement," and "Motivation."

Policy Support	Please indicate the extent to which you would personally favor or oppose each of the following proposals about what can or should be done to deal with adolescents' use of alcohol and other drugs. *[Randomize order of statements; 7-point Likert scale: Strongly oppose; Oppose; Slightly oppose; Neither favor nor oppose; Slightly favor; Favor; Strongly favor.]* Participants were asked about a range of proposals, such as "Requiring health care providers, such as doctors and nurses, to be trained in how to detect and address the use of alcohol and other drugs among adolescents."
Support for Public Funding of Programs	Below is a list of different types of programs to deal with adolescents' use of alcohol and other drugs that compete for public funding. For each one, please indicate how much you would like to see public funding increase or decrease. *[7-point Likert scale: Significantly decrease; Decrease; Slightly decrease; Keep about the same; Slightly increase; Increase; Significantly increase.]* Participants were asked about a range of programs, such as "Programs to prevent adolescents from beginning to use alcohol and other drugs," "Programs to identify early use of alcohol and other drugs among adolescents, so that steps can be taken to prevent increased use," and "Programs to treat adolescents who have developed an addiction to alcohol and other drugs."

In these two experiments, we tested values, explanatory metaphors, an analogy, an explanation of pediatricians' role in addressing adolescent substance use, and four messengers. Frame effects were determined through a quantitative analysis that compared data from treatment groups and the control group.

We conducted a third experiment to test different names for regular, preventive screening. This experiment used a sample from Mechanical Turk that, unlike the samples of the first two experiments, was not nationally representative. This was a question-wording experiment; it measured how different terminology used to refer to screening affected attitudes toward and understandings of screening. Attitudes and understanding were measured by a series of closed-ended questions. The effects of varying terminology were determined through quantitative comparison between the experimental conditions.

Persistence Trials and Peer Discourse Sessions

The third method for empirical testing of frames was persistence trials. We conducted four sessions on the *Boiling Over* metaphor with members of the public, which included a total of 24 participants. Sessions were held in Baltimore, Maryland, and Denver, Colorado, in October 2017. Participants in these sessions were recruited to vary across a range of demographic characteristics. Persistence trials are a group-based

method in which pairs of participants are asked to pass a metaphor to one another in conversational discourse. This method enables us to learn more about how explanatory metaphors affect people's thinking and are communicated in social discourse. After persistence trials concluded, we conducted brief, 30-minute peer discourse sessions with the six participants who had participated in each persistence trial. These sessions were used to further examine how members of the public understand and process messages about pediatricians' role in addressing adolescent substance use.

In addition to these sessions with members of the public, we conducted two peer discourse sessions with 13 health care practitioners, in Washington, DC, in November 2017. These sessions included a mix of health care practitioners who varied in professional position (for example, pediatricians and nurses), as well as practice setting (for example, schools, community clinics, and hospitals). In these sessions, we explored how practitioners understand adolescent substance use, how they process the *Boiling Over* metaphor, and how they make sense of and work with the explanatory message about pediatricians' role.

What frames worked—and which didn't?

The findings below are organized by type of framing tool or strategy. We review, in order:

- Values
- Explanatory metaphors
- Explanations of health care providers' role
- Messengers
- Names.

Each of these different tools, or frame elements, has a different function. For example, values are organizing principles that help people understand why an issue matters and inform decision-making. Explanatory metaphors compare an issue (in this case, adolescent substance use) to something familiar to help people understand how the issue works and unlock new ways of thinking and reasoning about the issue. Within a comprehensive reframing strategy, each of these tools has a specific role to play.

In this report, we offer a deep dive into findings about these tools and what they can accomplish. In the "playbook" for communicators that will soon be published to accompany this report, we will provide applied recommendations about how to use these tools within a broader reframing strategy.

Some of these tools accomplish one specific task, while others accomplish multiple framing functions. As we present findings, we note which of the tasks each tool accomplishes.

Values

Because values help people understand why an issue matters and provide reasons for action, we expected, going into the experiment, that the values messages might have effects on outcomes that involve either (1) perceived responsibility for addressing adolescent substance use or (2) thinking about what can or should be done about the issue. Specifically, we believed values might help people understand adolescent substance use as a health issue—a matter of collective concern that should involve medical health professionals—rather than as a social issue for family and friends to deal with (task #1 above); promote a sense of collective responsibility (task #4) and collective efficacy (task #5); and build support for evidence-based policies (task #6).

As we discuss below, our initial test of values, in the first survey experiment, did not produce clear findings about the relative effectiveness of different values. This failure tells us something important about *how* values messages must be used to be effective. Before we dig into those findings about how to use values, we begin with findings from our second-wave experiment, which did yield clear findings about which values are and are not effective on this issue.

In this second experiment, we tested three values—*Moral Responsibility*, *Health and Happiness*, and *Economic Wellbeing*.

VALUES TESTED IN THE SURVEY EXPERIMENT

Moral Responsibility: Our moral obligation to our young people means that we need to take steps to reduce the use of alcohol and other drugs among adolescents.

Health and Happiness: To ensure the health and happiness of our communities and our country, we must reduce the use of alcohol and other drugs among adolescents.

Economic Wellbeing: To ensure the economic wellbeing of our communities and our country, we must reduce the use of alcohol and other drugs among adolescents.

For the full message treatments used in the experiment, see Appendix B.

These values-based messages briefly explained how substance use affects adolescents and our country and made a case for why we, as a country, should make it a priority to reduce the use of alcohol and other drugs among young people and, in particular, why we should focus on preventing use. The effects discussed varied in accordance with the value: The *Health and Happiness* value discussed physical and mental health effects, *Economic Wellbeing* discussed individual and collective economic impacts of use, and *Moral Responsibility* touched on both economic and health effects. This experiment yielded several important findings.

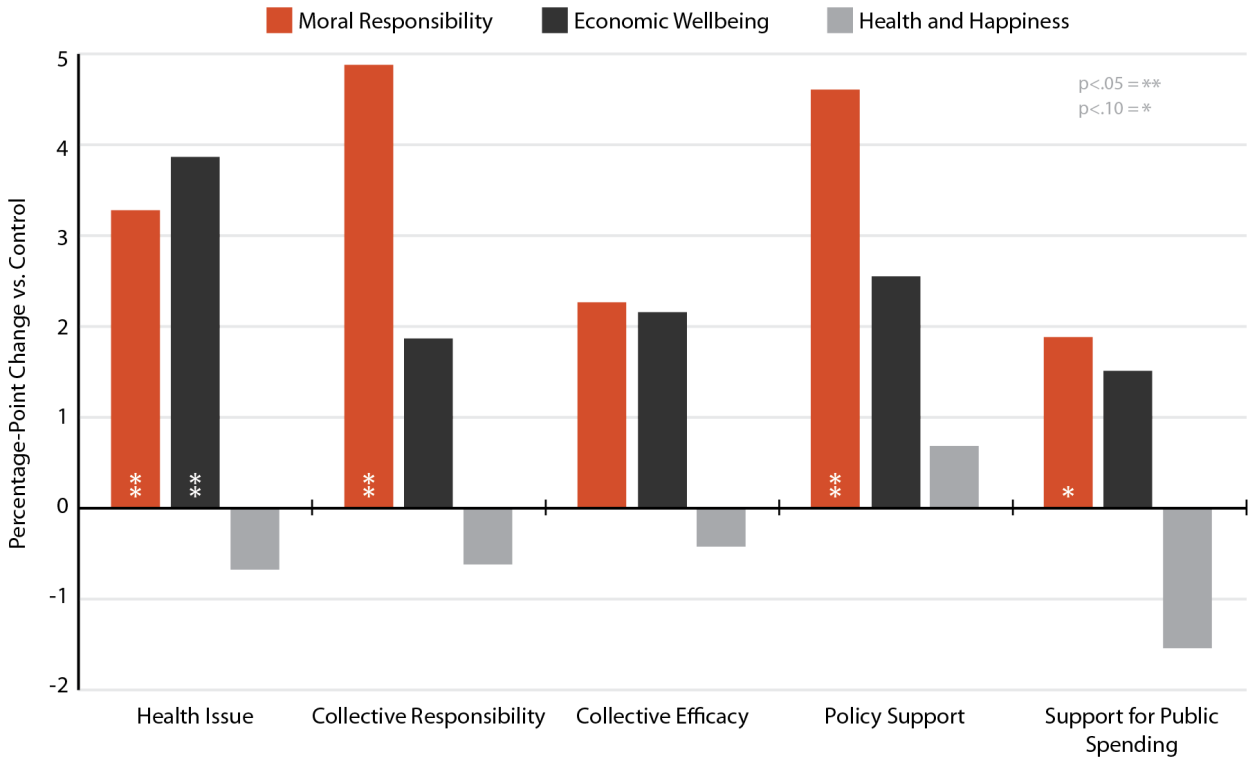
FINDING #1:

The value of *Moral Responsibility* helps people see adolescent substance use as a matter of collective concern and increases support for evidence-based policies.

Moral Responsibility was the most effective of the values, producing statistically significant gains on three of the five targeted outcome scales (see Figure 1). The value helped respondents better recognize the role of health care professionals in addressing adolescent substance use. It promoted a sense of collective responsibility—the sense that we, as a society, have an obligation to take steps to reduce substance use among adolescents. It increased support for evidence-based policies and programs that prevent or address adolescent substance use (see Appendix C for the specific policies tested). And it produced an increase in support for public funding of programs to address adolescent substance use that approached statistical significance ($p = .067$).

FIGURE 1:

Effects of Values, Second Experiment



The value appears to produce these results by helping people recognize that adolescent substance use is a matter of collective concern—something our entire society has a responsibility to address. This directly explains the results on the *Collective Responsibility* scale and indirectly explains the other increases. *Moral Responsibility* makes an explicit case that our society has a responsibility to address the issue, so the increase on the *Collective Responsibility* scale follows directly from argument being made. The recognition that the issue is a matter of collective concern, in turn, produces a desire to devote collective resources to programs and policies that would help, which explains why we see an increase on the *Policy Support* scale. The increase on the *Health Issue* scale is slightly harder to explain, because the relationship of this outcome to the argument being made is relatively attenuated. In interpreting this result, it is important to keep in mind that this scale measures people's sense of what role health care providers should play in addressing the issue. It is likely that the value moves this scale because, by cultivating a sense of collective responsibility, it leads people to believe that we need to use all our social resources—including health care providers—to address the issue, instead of leaving it to an adolescent's friends and family.

FINDING #2:

There is inadequate evidence to show that *Economic Wellbeing* is effective.

Economic Wellbeing had a statistically significant effect on the *Health Issue* scale, but not on the other targeted scales.[2] This suggests that the value does have some productive effects on people's thinking, but its failure to move the *Policy Support* and *Collective Responsibility* scales indicates that the value is not an effective way to help people see adolescent substance use as a matter of collective concern that requires collective action. Given the limited effects of the value and its failure to move key outcomes, there is not adequate evidence that *Economic Wellbeing* is, on the whole, an effective value on this issue.

FINDING #3:

The value of *Health and Happiness* is ineffective.

Unlike the other two values, *Health and Happiness* was wholly ineffective, producing no positive significant effects. In fact, it had negative, though not significant, effects on four of the five targeted outcome scales.

The value's ineffectiveness likely stems from the fact that it individualizes the issue. *Moral Responsibility* taps directly into the idea that the issue is a matter of collective concern, and *Economic Wellbeing* leverages people's existing recognition that the economy is a collective issue to broaden people's perspective on adolescent substance use. By contrast, health is an issue that tends to be individualized. In our research on health, we have consistently found that the American public assumes that our health outcomes are largely the product of individual choices, and that responsibility for health lies with individuals.[3] In our message treatment for *Health and Happiness*, we tried to orient people collectively by talking about "the health and happiness of our communities and our country," but this was likely inadequate to combat people's individualistic assumptions. If the value was understood in individualistic terms, this would explain why it did not lead people to recognize that our society can and should take steps to address adolescent substance use.

FINDING #4:

Explaining the effects of adolescent substance use is an essential part of a values-based message.

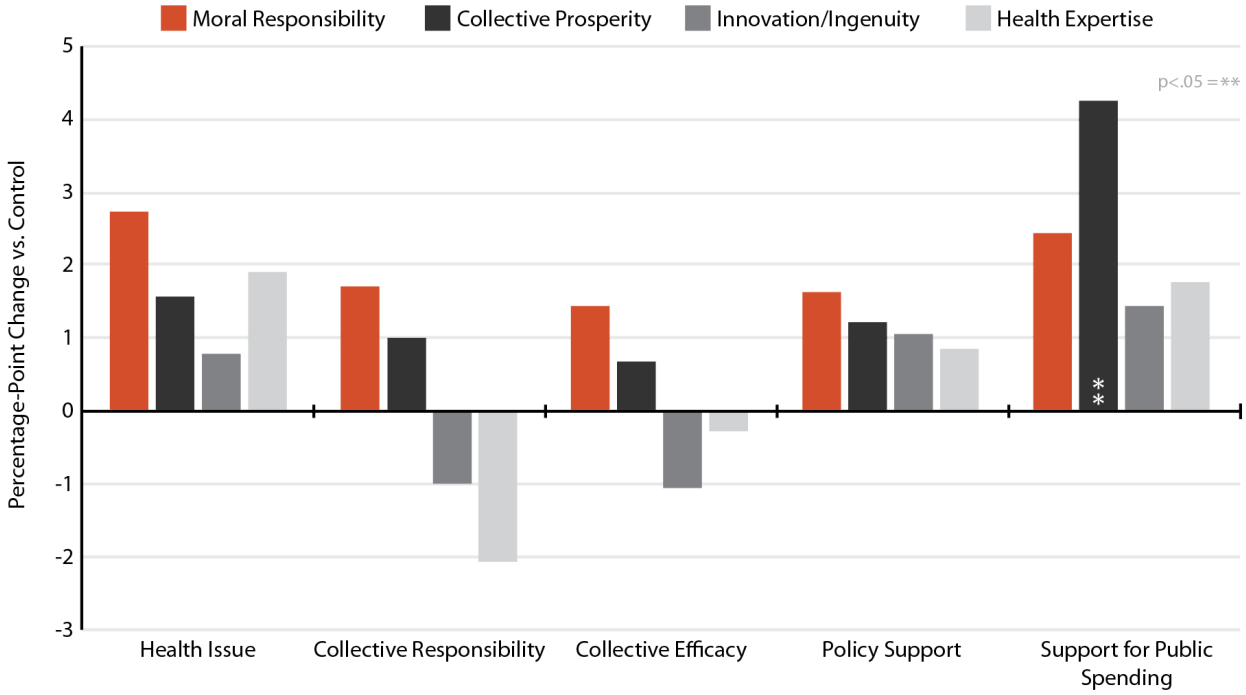
As noted above, the message about *Moral Responsibility* that proved effective in the second experiment included information about how substance use affects adolescents and, in turn, our country as a whole. This information is a crucial part of the message. We can deduce this by comparing results for *Moral Responsibility* in the second experiment to results for the same value from the first experiment.

In the first survey experiment, we tested four values messages (*Health Expertise*, *Innovation/Ingenuity*, *Moral Responsibility*, and *Collective Prosperity*). The values were generally ineffective, producing a single

statistically significant effect—an increase in support for public spending on programs, produced by *Collective Prosperity* (see Figure 2). (This finding is consistent with what we found in regard to *Economic Wellbeing*—that instrumental, economic values have a slightly productive effect on thinking, but are generally ineffective.)

FIGURE 2:

Effects of Values, First Experiment



What is noteworthy here is that *Moral Responsibility* was highly effective in the second experiment, but it failed to produce significant effects in the first experiment. The main difference between these two message treatments is that the message used in the second experiment included an explanation of the *effects* of use, while the message in the first experiment had no mention or discussion of effects. We can infer from this that talking about effects is necessary for the value to be truly effective.

However, information about effects is unlikely to produce these gains on its own. While we did not test a message that only included information about effects without embedding this within a values frame, it is notable that, in the second experiment, the values were not all successful, despite the fact that they all included information about effects. It thus appears that message effects result from the combination of the value of *Moral Responsibility* and information about effects, rather than from one or the other.

Why might this be the case? There is an intuitive and straightforward explanation: It is necessary to make clear the stakes of the issue—the profound and enduring ways in which use affects adolescents' health and lives—to convince people that action must be taken. Yet without the right value, people are not convinced

that it is *society* that must take action. By appealing directly to our collective moral responsibility to young people, we activate people's sense of collective responsibility and, in turn, generate support for collective action. In short, talking about effects builds a sense of urgency, while the value orients people collectively.

Explanatory Metaphors and Analogies

Explanatory metaphors are framing tools that enable people to reason about an issue in a different way. Like analogies, explanatory metaphors compare a target issue to something more familiar to help people better understand how the target issue works. At the beginning of the prescriptive research process, FrameWorks researchers identified task #2 above—generating an understanding of how protective factors mitigate the escalation of use—as a task that explanatory metaphors are well-equipped to address. While the public understands many of the risk factors for use, such as parental or peer use, people have a limited understanding of protective factors and how they can mitigate use. In particular, people lack an understanding of how changes to the environment or proven programs and interventions can prevent substance use among adolescents or reduce use early on—before it becomes a serious problem.

FrameWorks' researchers brainstormed a set of candidate explanatory metaphors designed to help people understand protective factors, and then tested these metaphors in a series of methods: on-the-street interviews, a survey experiment, and persistence trials. We also explored messages that compared adolescent substance use to other health issues in on-the-street interviews and a survey experiment. Through this research, one metaphor—*Boiling Over*—emerged as an effective explanatory tool.

EXPLANATORY METAPHORS AND ANALOGIES TESTED IN THE SURVEY EXPERIMENT

Boiling Over: When adolescents experiment with alcohol and other drugs, it can heat up and boil over into a bigger problem. By creating environments that keep the heat down for adolescents, we can prevent substance use from boiling over into a bigger problem.

Gaining Traction: When adolescents experiment with alcohol and other drugs, it can slide out of control into a bigger problem. By creating environments that give adolescents traction, we can prevent substance use from sliding out of control.

Monitoring Sparks: When adolescents experiment with alcohol and other drugs, these sparks can catch fire and spread into a bigger problem. By creating environments where it's hard for use to catch, we can prevent the sparks of use from spreading into a bigger problem.

***Asthma*:** The best way to prevent asthma is to create a healthy environment by reducing things like pollution and secondhand smoke. Similarly, we can prevent adolescents from developing problems with alcohol and other drugs by creating healthy environments—at home, in school, and in the broader community.

Below, we outline explanatory metaphor and analogy findings that emerged from this mixed-method research.

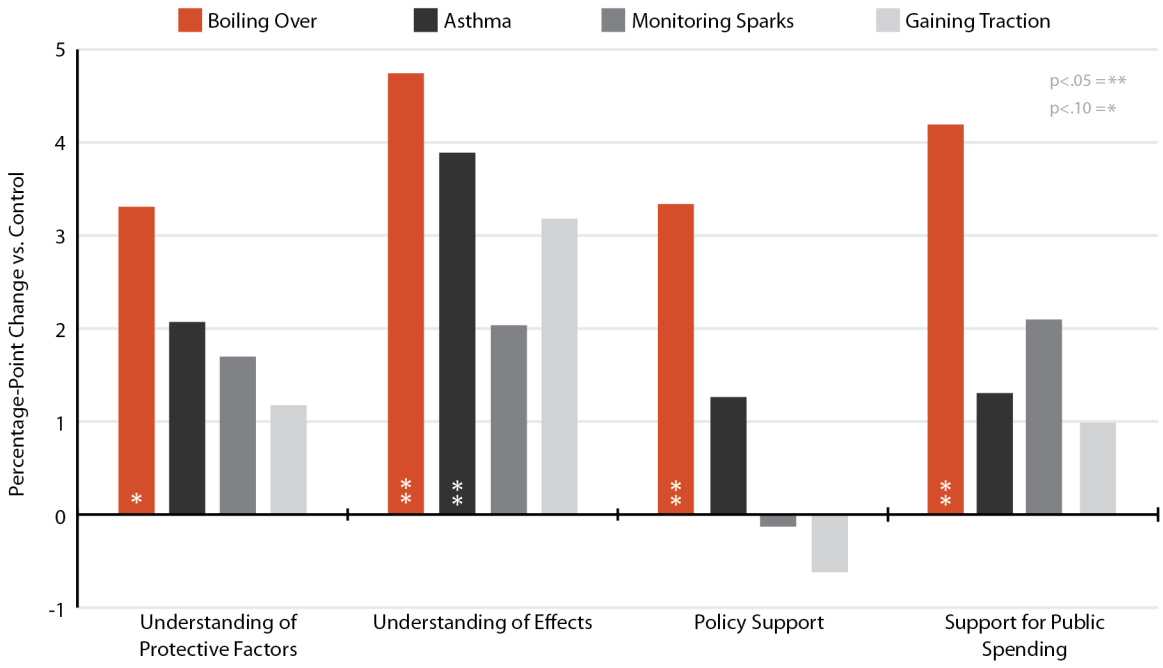
FINDING #1:

The *Boiling Over* explanatory metaphor helps people understand protective factors and solutions that promote these factors.

Evidence from across methods shows that the *Boiling Over* metaphor is effective in accomplishing its targeted task. In the survey experiment, it increased understanding of the importance of protective factors by 3.3 percentage points, compared to the null control group—an increase that approaches, though it does not reach, statistical significance ($p = .057$). The metaphor produced statistically significant gains on *Policy Support*, as well as on *Support for Public Spending*. These results show that the metaphor increases people's support for the types of preventive measures that experts recommend, and for increasing spending on prevention, early intervention, and treatment. The metaphor also produced a significant increase in understanding of the effects of adolescent substance use, although, as we discuss below, there is an important caveat to this particular finding.

FIGURE 3:

Effects of Explanatory Metaphors and Analogies



On-the-street interviews and persistence trials provide further evidence that the *Boiling Over* metaphor helps people better understand protective factors by bringing environmental influences more clearly into view. In both methods, participants easily understood and were able to readily apply the metaphor—that, just like a pot of water, we can "cool down" and "turn down the heat" on substance use by creating healthy

environments and providing the right supports and services. Analysis of persistence trials found that comparing use to a pot of water helped participants think about how the environment outside the adolescent can heat up use or keep things cool, and how protective factors can, like ice cubes, cool down use even after it has started to heat up.

The metaphor also expands people's understanding of the importance of early intervention and prevention, and helps people recognize what types of protective factors can prevent or reduce use. By focusing people on the fact that substance use, like temperature, is a continuum, the metaphor helped participants see more clearly the possibility of intervening at different points along the spectrum of use. Participants picked up on and discussed the needs to keep the heat down in the first place and to turn it down when problems occur. The metaphor helped participants understand that just as it's easier to cool off water before it gets too hot, interventions can more easily cool down use before it has heated. And because the metaphor brings the environment more clearly into view (as the source of heat), participants in persistence trials frequently brought up the need for supports and services *outside* the family. In persistence trials, people frequently talked about the importance of supportive relationships with non-family members, such as coaches and mentors. The survey experiment shows that the metaphor also helps people see the value of broader policy interventions to reshape the environment. For example, it increased people's support for changing zoning laws to prevent liquor stores from being located near schools.

As noted above, in the survey experiment, the *Boiling Over* metaphor had a statistically significant positive effect on the *Understanding of the Effects of Use* scale. While the metaphor was not targeted at this outcome—it does not communicate directly about the effects of substance use—it seems to have had a "spillover effect," generally helping people recognize the seriousness of adolescent substance use.

FINDING #2:

The *Boiling Over* metaphor is sticky.

On-the-street interviews and persistence trials provide clear evidence that the language of the metaphor sticks in people's minds, and that people easily pick up and apply this language to talk about adolescent substance use. Participants quickly took up the language of use "heating up" or "cooling down," and the idea that use can "boil over" into a serious problem was especially sticky.

This stickiness indicates that the metaphor is likely to be picked up by people and repeated and, in turn, is likely to enter into public discourse as a part of the popular lexicon used to talk about this issue.[4] This stickiness suggests that, with sufficient repetition by communicators, the metaphor has strong potential to enter into and structure the public conversation about adolescent substance use, providing a productive way of talking about risk and protective factors and the value of prevention and early intervention.

FINDING #3:

The *Boiling Over* metaphor does not automatically problematize experimentation.

In persistence trials, participants sometimes interpreted a "cool pot" to mean low-level use, rather than no use. In this way, the metaphor did not inoculate against the assumption, found in earlier research, that experimentation is natural.[5] People assumed that the goal was to keep use low, rather than to prevent use altogether. In other words, in persistence trials, the metaphor did not lead people to rethink their default assumption that experimentation is normal and acceptable.

The equation of a "cool pot" with low-level use was likely the result of lack of clarity in the wording of the message. The message used in persistence trials did not explicitly state that a cold pot of water means *no* use. In the absence of clarity about this point in the message itself, participants drew on their default assumptions about experimentation (that it is normal) to fill in the blanks.

If communicators want to problematize experimentation, they should be explicit in equating a cold pot with zero use. Applying the metaphor in this way would likely prevent people from defaulting to the idea that experimentation is natural and acceptable.

HEALTH CARE PRACTITIONERS' RESPONSE TO *BOILING OVER*

In peer discourse sessions with doctors, nurses, and other health care practitioners, we found that participants were able to easily apply the *Boiling Over* metaphor. Just as with public participants, the language of the metaphor was sticky, and the metaphor facilitated productive conversation about the spectrum of use and the importance of prevention and early intervention.

Yet practitioners pushed back against the metaphor, suggesting it was obvious. This response was almost certainly provoked by the sense that the metaphor was explaining something to them that, as health care providers, they were already experts about. In other words, practitioners bristled because they felt like they were being explained *to* about something they are qualified to explain *about*.

We know from cultural models research with health care practitioners that they share many of the public's problematic assumptions, including a failure to prioritize prevention and early intervention. Contrary to their own self-perception, practitioners' thinking is not aligned with the experts on this issue. The metaphor's ability to provoke a productive discussion of the issue among practitioners suggests that engaging practitioners with the metaphor is valuable. Given practitioners' push back, it may be that the best way to engage practitioners with the metaphor is as messengers, to avoid the implication that they lack knowledge of the issue. Putting the metaphor in the hands of practitioners and asking them to use it to explain adolescent substance use to others will require them to engage with the metaphor. In the process of communicating with others, practitioners' own thinking is likely to shift in productive ways as a result of using the metaphor.

FINDING #4:

Health analogies are largely ineffective.

Across several methods—peer discourse sessions, on-the-street interviews, and survey experiments—we explored whether analogizing adolescent substance use to other health issues, such as asthma, lead poisoning, and high blood pressure, might help people see adolescent substance use as a health issue and recognize the value of screening and early intervention.

We found that these analogies are generally ineffective, due to the public's assumptions about health and health issues. In an initial set of peer discourse sessions, we explored the analogy with high blood pressure and found that the analogy triggers highly individualistic understandings of health. While the analogy did help people recognize the importance of prevention, participants understood prevention in terms of individual choice—just as individuals should make healthy choices so they don't get high blood pressure, adolescents should make wise choices so they don't develop substance use problems.[6] This directed attention away from contextual factors as well as screenings and early intervention and trained participant thinking on "choice" and "will" as the means of prevention.

In on-the-street interviews, the analogy with lead poisoning also provoked individualistic thinking. Participants saw lead poisoning as an exception to the rule—it is a health problem that is *not* within individuals' control—and rejected the analogy on this basis, since, by their thinking, substance use is a choice that *is* within individuals' control. In other words, the perception of discordant features between the items of the analogy led to a rejection of the comparison and its implications. The lead poisoning analogy also reinforced a misunderstanding of "screening" as biological testing since lead testing involves testing of bodily substances. (See below for a discussion of the term "screening" and how to avoid this common misunderstanding.)

The analogy with asthma proved somewhat more promising in on-the-street interviews. Because people recognize that environments play a role in causing or exacerbating asthma, the analogy helped bring environmental influences on substance use into view, much like *Boiling Over* does. However, as Figure 3 illustrates, the survey experiment found the analogy to be ineffective on most outcome scales. The analogy failed to increase understanding of protective factors or to increase support for evidence-based policies or for increasing public spending on programs. As we noted above, we hypothesized that the analogy might increase understanding of adolescent substance use as a health issue, but the analogy had no effect on the *Health Issue* scale (not pictured).

On-the-street interviews suggest a possible reason for the ineffectiveness of the asthma analogy. Analysis showed that while the analogy helped people think about environmental *risk* factors, it did not help in thinking about *protective* factors—things that can be done to decrease the likelihood of use. This is likely a result of the relative difficulty of changing the features of the environment that cause asthma. It may be that the environmental causes of asthma (for example, air quality issues) are assumed to be an inevitable part of modern life and thus not susceptible to change. This may have led people to think that, similarly,

the environmental causes of adolescent substance use cannot really be changed, making it hard for people to recognize how immediate steps can be taken that can protect adolescents from using.

Health analogies appear to be largely ineffective as a strategy for communicating about adolescent substance use. Because the public does not adopt a public health perspective toward other health issues—the public does not inherently or deeply understand the role of environmental influences or recognize that environments can be intentionally and actively designed to promote health—comparing adolescent substance use to other issues is unlikely to produce the desired shifts in public thinking.

Explaining the Role of Health Care Providers: Key Points and Messengers

One of the identified reframing tasks was to promote recognition of the critical role of health care providers in addressing adolescent substance use (task #1 above). This task emerged from cultural models research, which found that the public sees adolescent substance use as a social issue, not a health issue. As we noted above, because people don't usually understand how the use of alcohol and other drugs can affect healthy adolescent development, they think of it as a purely social issue that is best dealt with by parents and teachers, and don't see a role for primary care providers in addressing or preventing use. People understand that mental health professionals are and should be involved in treating youth with serious substance use problems but assume that health care involvement is appropriate only in these extreme cases.

In exploring ways to cultivate understanding of the importance of health care providers in prevention and early intervention, we tested the effect of messengers—the person or group speaking about the issue. Messengers can shape how people receive and process information. More credible messengers can make people more likely to believe or act on a message. Perceptions of credibility can stem from different sources: messengers' expertise, their identity, or whether or not they have a personal interest at stake in the issue.[7]

We hypothesized that several specific types of people might be effective messengers for communicating about adolescent substance use as a health issue: adolescents themselves, parents, pediatricians, and mental health providers. We expected that adolescents and parents might be credible because of their identity and personal relationship to the issue, while pediatricians and mental health providers might derive credibility from their professional expertise.

MESSENGERS TESTED IN THE SURVEY EXPERIMENT

No Messenger: Explanation of role of pediatricians that was not attributed to a particular source.

Adolescents: Opinions were attributed to a recent survey of adolescents, and an adolescent is quoted talking about what "I feel" and what "my pediatrician" does.

Parents: Opinions were attributed to a recent survey of parents, and a parent is quoted talking about "my child."

Pediatricians: The explanation is attributed to the "National Association of Pediatricians," and a pediatrician is quoted talking about himself and "my adolescent patients."

Mental Health Professionals: The explanation is attributed to the "National Association of Mental Health Professionals," and a mental health professional is quoted talking about "the pediatricians I work with" and "their adolescent patients."

To test these messengers, we crafted a base message that explained how health care providers can help prevent use from starting or keep it from escalating once it has begun. The message explained how pediatricians can identify potential problems early by having conversations with adolescent patients, providing information about how use affects health, and referring patients to help as needed, such as linking them up with mental health professionals. (See the below graphic, "Explaining the Role of Primary Care Providers in Preventing Adolescent Substance Use," for a discussion of how the explanation was crafted and the key choices that were made in creating this message.) In the second of our two survey experiments, we tested this base message on its own, without attributing it to any messenger (the "No Messenger" treatment described in the above graphic), along with treatments that attributed the same explanation to different messengers.

EXPLAINING THE ROLE OF PRIMARY CARE PROVIDERS IN PREVENTING ADOLESCENT SUBSTANCE USE

We developed the explanation of health care providers' role tested in the survey experiment to address several specific areas of skepticism identified in cultural models and on-the-street interviews:

- ***Invasiveness of screening.*** Our analysis of on-the-street interviews revealed that when people hear about "screening for substance use," they often assume this means biological drug testing, and express concern that this is a violation of adolescents' privacy and is too invasive to be done regularly with all adolescents. To address this misunderstanding, the message avoided the term "screening" and instead explained that pediatricians can "have a conversation about alcohol and other drugs" with their patients.

- ***Confidentiality.*** In on-the-street interviews, participants assumed that parents would be privy to conversations between adolescents and doctors, and they expressed skepticism about whether adolescents would be honest about use given that their parents might find out. To address this worry, the explanation made clear that conversations are confidential unless adolescents are in immediate danger.

- ***Action steps.*** As noted above, in cultural models interviews, we found that members of the public struggle to think of any practical steps pediatricians could take to prevent adolescent substance use. To help fill in the blanks, the explanation translated brief interventions and referrals into colloquial terms.

Below is an annotated version of the "No Messenger" treatment, which, as noted above, provided the base treatment used for all of the messenger treatments.

Pediatricians should play a larger role in addressing alcohol and other drug use among adolescents.

Pediatricians are in a unique and important position to help reduce drinking and other drug use among younger people. They can have a conversation with adolescent patients about alcohol and other drugs during regular visits. Younger people can feel comfortable talking to a pediatrician about drinking and drug use because, unless they are in immediate danger, anything a patient tells the pediatrician can stay between them. Pediatricians can also give adolescent patients information about how drinking and drug use can affect their health. And if a patient has a problem, a pediatrician can refer them to whatever help they might need, like linking them up with a mental health professional.

All pediatricians should do things like this, so that we can prevent substance problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

The message talks about "having a conversation about alcohol and other drugs" rather than "screening" to avoid misunderstandings that attach to this term.

Being explicit about confidentiality is necessary to address skepticism about whether adolescents will be honest.

Providing a concrete description of brief interventions and referrals is necessary to clarify how health care providers can help.

Results of the experiment indicate that while the right messengers can amplify the effectiveness of the message, explaining the role of primary providers (as in the base message) may be even more important.

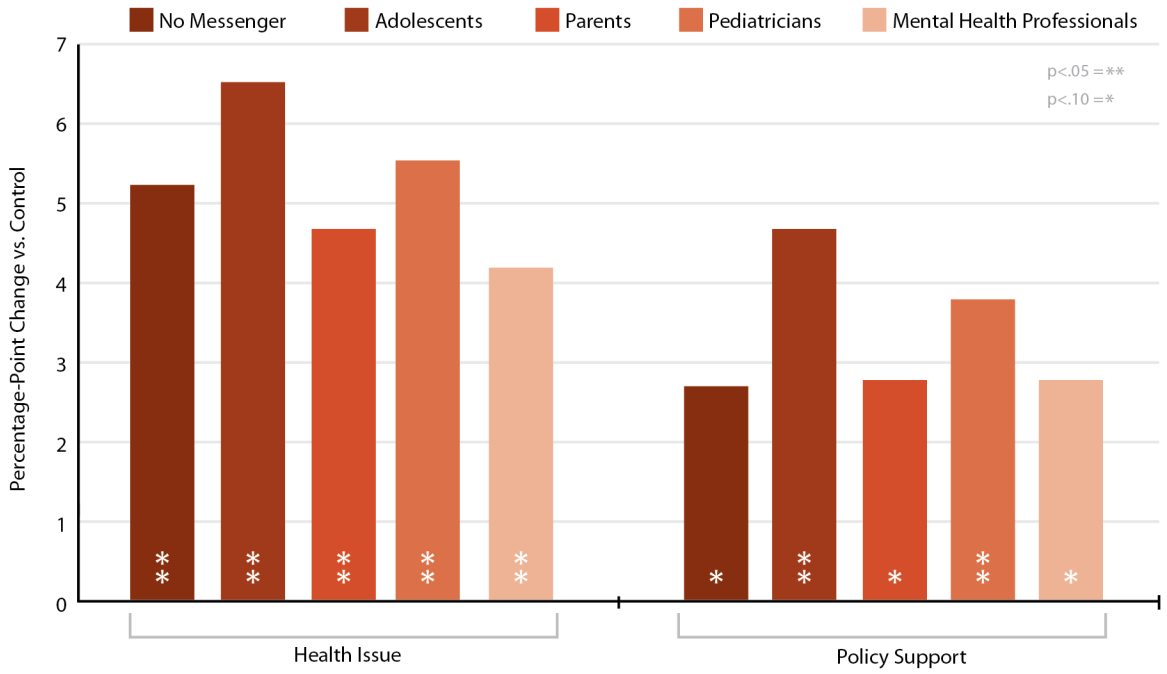
FINDING #1:

Explaining what primary care providers do and addressing sources of skepticism are essential.

All messages—including the version of the explanation that did not include a messenger—were effective in increasing people's understanding of adolescent substance use as a health issue (see Figure 4). In addition, all messages produced gains in support of evidence-based policy that either were statistically significant ($p < .10$) or approached significance ($p < .10$).

FIGURE 4:

Messengers on Health Care Providers' Role



These strong results indicate that a clear explanation of what primary care providers can do in relation to adolescent substance use helps people recognize their importance. The value of *explaining* providers' role rather than merely asserting it is further supported by comparing these results to results from the first experiment. That experiment tested a message that appealed to health care professionals' expertise and argued that we should draw on their training, knowledge, and skills to reduce the use of alcohol and other drugs among adolescents (the *Health Expertise* message referred to in Figure 2). This message treatment—which did not include any supporting explanatory elements, but simply asserted the value of drawing on health care expertise—was wholly ineffective. Its effects were not statistically significant on any scale, nor did they approach significance on any scale. By contrast, the health care provider message tested in the

second experiment, which was effective, was explicit about and explanatory in laying out the role that health providers can play in relation to adolescent substance use.

Put simply: It is not enough to mention that health care providers have a role to play or merely to assert their expertise. Results show that it is vital to *explain* health care providers' role and, in doing so, include language that mitigates and addresses the public's predictable points of concern—about confidentiality, the invasiveness of screening, and what, concretely, health care providers can do.

In peer discourse sessions following the survey experiment, we further explored how to explain health care providers' role. Analysis of these discussions confirmed the value of explaining the role of these providers in addressing adolescent substance use. These sessions also revealed two additional sources of skepticism about the role of health care providers and the importance of addressing this skepticism in communications:

- **Participants worried that doctors do not have enough time with patients to make a difference.** Participants recognized how short most office visits are, which led to skepticism about how much difference primary care providers can make in addressing a behavioral issue like substance use.

- **Participants were concerned about doctors' ability to engage adolescent patients in authentic and productive ways.** When thinking in this way, participants were skeptical about doctors' ability to elicit and engage in productive and honest conversations with adolescents.

As noted below, the messenger conditions likely help to address the second of these concerns. The first concern should be addressed by explaining in concrete terms how screening and early prevention can be performed in relatively short office visits.

FINDING #2:

Pediatricians and adolescents are the most effective messengers.

As discussed above, explaining health care providers' role without a messenger proved effective. However, these positive effects were amplified by using adolescents and pediatricians to deliver this explanation. As Figure 4 illustrates, these messages produced the largest effects, including statistically significant gains on the *Policy Support* scale. While the other messengers did not interfere with the effectiveness of the explanation, it was only adolescents and pediatricians who amplified these effects.

This indicates that the two parties involved in the interaction—adolescents and pediatricians—have the greatest credibility as messengers. It is likely that adolescents are effective messengers because they address people's concern that adolescents won't be willing to cooperate and won't be honest, and thus that these interactions are likely to be ineffective as opportunities for preventive intervention. If adolescents themselves express support for these interactions, this likely boosts the perception that adolescents will be willing to participate. We can reasonably assume that, because the public accepts pediatricians as experts,

they are more likely to accept the claim that these interactions are valuable when it comes from these providers.

Both messengers implicitly address the second concern identified in peer discourse sessions—that pediatricians aren't people with whom adolescents will engage in open and candid conversations. If pediatricians themselves are emphasizing, in a warm way, their concern for adolescents and their willingness to engage in an open conversation, this signals a measure of relatability. By the same token, if adolescents are willing to engage in open conversations with pediatricians, this indicates that they find pediatricians to be relatable enough to talk with. These messengers inoculate against people's suspicion about the ability of pediatricians to have authentic and meaningful conversations with adolescents.

Names: How to Talk about Screening

As noted above, our analysis of on-the-street interviews found that the term "screening" is often misunderstood and taken to mean the testing of biological samples. To find ways of referring to screening that are more apt and that make more readily apparent what kind of screening is being done, we designed a survey experiment to determine the attitudes and understandings elicited by different names for describing this type of screening:

The experiment explored three terms for referring to screening:

1. "screening"
2. "asking about use"
3. "having a conversation about use."

We also tested two other wordings, which used the term "screening" but then specified what this meant using one of the other terms:

4. "screening by asking about use"
5. "screening by having a conversation about use."

The experiment found that the name or term used to describe screening has a large and significant impact on people's understandings and attitudes.

FINDING #1:

When talking about verbal screening for use, it is better to talk about "asking about" use or "having a conversation about" use than to use the term "screening."

The experiment found that using these alternative terms instead of "screening" improves understandings of and attitudes toward the activity. In comparison to the "screening" condition, the alternative terms

significantly increased people's support for the practice, led them to judge it to be more appropriate, and decreased their sense that it is invasive. (There was no effect on judgment of effectiveness.)

The effects of these alternative terms are likely a result of clarifying that the type of screening being discussed does not involve biological drug testing. This interpretation is supported by other data collected in the experiment, as well as data from on-the-street interviews. On-the-street interviews indicated that Americans are opposed to the idea of conducting regular tests of adolescents' biological samples for indications of alcohol or drug use. The survey experiment data suggest that this is exactly what the term "screening" calls to mind: Over 75 percent of respondents who received a message using only the term "screening" indicated that they believed the practice involved biological testing. Moreover, the word appears to evoke connotations of surveillance and threat, given the number of respondents who thought the purpose of "screening" was to catch and punish adolescents. Twenty-three out of 100 respondents in the "screening" condition thought this was a purpose of the practice, compared to 1 out of 100 respondents in the "ask about" condition and 3 out of 100 respondents in the "have a conversation about" condition. These misunderstandings explain the lower levels of support for and perceived appropriateness of the term "screening."

FINDING #2:

It is best to avoid the term "screening" altogether, but if the term is used, it can be paired with the alternative terms to clarify what it does—and doesn't—mean.

The conditions that used the term "screening" but explained this using one of the other terms (that is, "screen by having a conversation" or "screen by asking") produced attitudes similar to, but not quite as positive as, the alternative terms on their own. In other words, using these alternative terms in conjunction with the term "screening" produced more favorable attitudes compared to using "screening" on its own, but not as positive as the conditions that did not include the term "screening" at all.

These results indicate that it is best to avoid the term "screening" altogether if possible, relying instead on synonyms that are no less accurate but that *are* more accurately understood. If communicators are already committed to using the term "screening," they should consistently specify that the practice involves "having a conversation" or "asking about use."

Conclusion

In sum, the findings of complementary qualitative and quantitative methods demonstrate that multiple frame elements can be used to reorient and expand the public conversation about young people and substance use. Emphasizing our shared *Moral Responsibility* to youth taps into productive shared values. Using pediatricians and adolescents as messengers helps the public understand how primary care settings are important sites for fulfilling that responsibility. The explanatory metaphor of *Boiling Over* productively expands Americans' understanding of protective factors and thinking about the importance and potential of primary prevention. And by attending to how screening is named and explained, communicators can build support for a public health approach.

A companion to this report—a framing "playbook"—models how to apply the tools and strategies discussed here as part of a comprehensive reframing strategy. We hope these findings will encourage members of the field to consider new ways of talking about adolescent substance use prevention. For instance, we hope that in documenting the importance of explanatory strategies, these findings will prompt communicators to reevaluate the persuasive techniques that have characterized the field's most visible and memorable campaigns—techniques that seek to shock audiences rather than cultivate greater understanding. We offer these findings as a contribution to the prevention field's ongoing conversation about how to use communications to divert youth from harmful paths and toward a healthier future.

Appendix A: Methods for Testing Frames

On-the-Street Interviews

We conducted 66 on-the-street interviews in Philadelphia, Pennsylvania, and Charleston, South Carolina, in April 2017. In intercepting passersby in public locations to participate in interviews, researchers were attentive to recruiting participants from different demographic groups, although, due to the mode of recruitment, we were unable to use specific demographic quotas. In these one-on-one interviews, we tested six explanatory metaphors (*Monitoring Sparks, Boosting Immunity, Boiling Over, Level Ground, Gaining Traction,* and *Velcro and Teflon*), two analogies that compared adolescent substance use to other health issues (*Lead Poisoning* and *Asthma*), and a message that explained that screening for substance use is valuable, just as it is for other health issues.

In the interviews, researchers began by asking participants a short series of open-ended questions designed to gather information about people's top-of-mind thinking about adolescent substance use. Participants then were orally presented with one of the frames and asked a series of follow-up questions to ascertain whether and how their thinking had shifted as a result of exposure to the frame.

Researchers analyzed the resulting video data, looking for patterned ways in which each of the candidate metaphors affected thinking and talking about adolescent substance use. The analysis also focused on isolating the reasons *why* each of the tested metaphors was having its respective effects. Based on the results of this analysis, we brought three metaphors (*Monitoring Sparks, Boiling Over,* and *Gaining Traction*) and one analogy (*Asthma*) forward for further investigation.

Survey Experiments

We conducted two online survey experiments with a common design in September and October 2017, including a total of 5,400 respondents. Respondents were adults (over 18) matched to national demographic benchmarks for gender, race/ethnicity, income, age, and political party.

In each experiment, respondents were randomly assigned to a message "treatment" or to a null control. The first experiment tested eight message treatments to understand how exposure to these frames affects public opinion. We tested four values (*Health Expertise, Innovation/Ingenuity, Collective Prosperity,* and *Moral Responsibility*), three explanatory metaphors (*Monitoring Sparks*, *Gaining Traction*, and *Boiling Over*), and one analogy (*Asthma*). In the second experiment, we tested three values (*Moral Responsibility, Health and Happiness*, and *Economic Wellbeing*), along with five messenger treatments (a base message that explained the role of pediatricians in addressing adolescent substance use with No Messenger, and four treatments that attributed a similar message to one of four messengers: Adolescents, Parents,

Pediatricians, and Mental Health Professionals). The values messages tested in the second experiment differ from the values messages tested in the first experiment in that they include a brief explanation of how substance use affects adolescents; information about effects was absent in the values messages tested in the first experiment. (See Appendix B for the text of the message treatments.)

After reading the message (or, in the null control group, no message), respondents were asked a series of questions designed to measure attitudes toward adolescent substance use, understandings of how it works, and support for evidence-based policies. Questions were either Likert-type items with seven-point scales or multiple-choice questions. Questions were randomized within seven *batteries*, or sets of questions related to a common idea, and the order of the first five batteries was randomized, with two additional batteries (on policy support and program funding) presented in consistent order afterward. (See Appendix C for the outcome measures used.)

We used multiple regression analysis to determine whether there were differences between the treatment groups and the control group. Regressions controlled for demographic variables and determined statistical significance of differences between the treatment and control groups. A threshold of $p < 0.05$ was used to determined significance. Significant differences between the treatment and control groups indicated that the messages affected people's opinions.

A third, question-wording, experiment tested the effects of different names for screening on people's attitudes and understandings. The survey was administered using Amazon's Mechanical Turk and was completed by 500 respondents.[8] In the survey, respondents were randomly assigned to receive one of five sets of questions. Each set of questions was identical, except in how it described screening. Respondents received questions that asked about screening in one of the following ways:

1. "Screening adolescents for alcohol and other drug use at regular visits."
2. "Asking adolescents about alcohol and other drug use at regular visits."
3. "Having a conversation with adolescents about alcohol and other drug use at regular visits."
4. "Screening adolescents for alcohol and other drug use by asking them about it at regular visits."
5. "Screening adolescents for alcohol and other drug use by having a conversation with them about it at regular visits."

In each experimental condition, respondents received a series of closed-ended questions using the designated terminology. For example, respondents in the first condition were asked, "To what extent do you personally favor or oppose requiring health care professionals, such as primary care doctors and nurses, to screen adolescents for alcohol and other drug use at regular visits?" Respondents in the second condition were asked, "To what extent do you personally favor or oppose requiring health care professionals, such as primary care doctors and nurses, to ask adolescents about alcohol and other drug use at regular visits?" In addition to gauging people's support for requiring screening, the questions asked about the *appropriateness* of screening, how *invasive* it is, and how *effective* it is. Respondents also answered questions designed to measure people's understanding of the purpose of screening. In addition,

respondents assigned to the first condition (using the term "screening" without explanation) were also asked a series of closed-ended questions designed to measure their understanding of what screening involves.

The analysis tested for statistically significant differences in the mean responses to each question between each condition. A significance threshold of $p < 0.05$ was used as an indicator that the given description for screening had an effect on responses.

Persistence Trials and Peer Discourse Sessions

We conducted four persistence trials on the *Boiling Over* metaphor with members of the public, including a total of 24 participants. Sessions were held in Baltimore, Maryland, and Denver, Colorado, in October 2017. Participants in these sessions were recruited to vary across a range of demographic characteristics, including ethnicity, gender, age, and political affiliation.

In a persistence trial, an initial pair of participants is presented with an explanatory metaphor, first as text and then conversationally by the researcher. The participants then discuss the explanatory metaphor with the moderator before teaching it to a subsequent pair of participants. Following the transfer, the second pair explains the explanatory metaphor to a third pair. Finally, the first pair returns to hear the transmitted metaphor from the third pair. This last step allows us to see whether the metaphor has persisted over the session and to enlist participants in explaining any changes that may have occurred to the metaphor.

Researchers analyzed the resulting video data to identify patterned ways in which participants used the metaphor, how much the metaphor stuck in people's minds and persisted in being communicated from one group to the other, and whether communication of the metaphor led to any distortions in its application. This analysis provided further evidence of the effectiveness of the *Boiling Over* metaphor while also providing insight into *how* the metaphor can be used most effectively.

After persistence trials concluded, we conducted brief, 30-minute peer discourse sessions with the six participants who had participated in the persistence trial. These sessions were used to further understand how members of the public understand and process messages about pediatricians' role in addressing adolescent substance use. In the sessions, moderators presented participants with the No Messenger explanation of pediatricians' role from the survey experiment, in writing and orally, and then asked a series of questions to elicit a group discussion about the message. Analyzing video data from this discussion enabled researchers to better understand message reception and develop recommendations about how to refine this message.

In addition to these sessions with members of the public, we conducted two peer discourse sessions with 13 health care practitioners in Washington, DC, in November 2017. These sessions included a mix of health care practitioners who varied in professional position (for example, pediatricians and nurses), and practice setting (for example, schools, community clinics, and hospitals). These sessions included a brief open-ended discussion about adolescent substance use to confirm baseline understandings of the issue among practitioners (verifying and deepening findings from earlier cultural models interviews conducted with practitioners); a discussion about the *Boiling Over* metaphor coupled with an exercise that asked participants to use the metaphor to explain why some adolescents develop issues with alcohol and other drugs and some don't; and a discussion about the No Messenger explanation of pediatricians' role, similar to the one conducted with the public. Analysis of video data from these sessions enabled us to determine whether and how these reframing strategies might be effective in communicating *to* health care practitioners, and how usable they might be as communications strategies used *by* health care practitioners.

Appendix B: Survey Experiment Treatments

Treatments from the First Experiment

VALUES:

Health Expertise

To solve the problems our society faces, we need to draw on the knowledge of health and science experts. This means making use of the expertise of health care professionals like doctors and nurses to address the use of alcohol and other drugs among adolescents. Health care professionals have special training, knowledge, and skills that allow them to identify adolescent substance use early and take steps to prevent problems from developing. By drawing on health care professionals' unique expertise, we can reduce the use of alcohol and other drugs among adolescents and keep them healthy.

Innovation/Ingenuity

To solve the problems our society faces, we need to adopt new and innovative approaches. This means using the cutting-edge approaches that health care professionals like doctors and nurses have developed to address the use of alcohol and other drugs among adolescents. Health care professionals are problem-solvers who have developed innovative new ways to identify adolescent substance use early and to prevent problems from developing. By relying on cutting-edge advances in health care, we can reduce the use of alcohol and other drugs among adolescents and keep them healthy.

Collective Prosperity

To ensure our society's future prosperity, we need to take the right steps now. This means having health care professionals like doctors and nurses address the use of alcohol and other drugs among adolescents, so they can fully contribute to our society when they become adults. Health care professionals can identify adolescent substance use early and take steps to prevent problems from developing, so adolescents grow into healthy adults who can contribute to society in positive ways. By taking steps to reduce the use of alcohol and other drugs among adolescents, we are investing in the future prosperity of our society.

Moral Responsibility

As a society, we have a moral responsibility to take care of our young people. This means we have an obligation to support adolescents by having health care professionals like doctors and nurses address the use of alcohol and other drugs among adolescents. Health care professionals can identify adolescent substance use early and take steps to prevent problems from developing, so they can help us meet our responsibility to promote adolescents' healthy development. By taking steps to reduce the use of alcohol and other drugs among adolescents, we can fulfill our collective obligation to care for our young people.

EXPLANATORY METAPHORS AND ANALOGIES

Monitoring Sparks

When adolescents experiment with alcohol and other drugs, these sparks can catch fire and spread into a bigger problem. We can prevent fires by regularly clearing brush and quickly put out fires if we have easy access to water. Similarly, we can prevent the sparks of substance use from catching by creating healthy environments for adolescents—at home, in school, and in the broader community—and we can put out use that is starting to catch with the right services and supports. By creating environments where it's hard for use to catch, we can prevent the sparks of use from spreading into a bigger problem.

Boiling Over

When adolescents experiment with alcohol and other drugs, it can heat up and boil over into a bigger problem. We can prevent a pot of water from heating up by turning off the heat or quickly cool the water down by adding ice cubes. Similarly, we can prevent substance use from boiling over by creating healthy environments for adolescents—at home, in school, and in the broader community—and we can cool down use that is starting to heat up with the right supports and services. By creating environments that keep the heat down for adolescents, we can prevent substance use from boiling over into a bigger problem.

Gaining Traction

When adolescents experiment with alcohol and other drugs, it can slide out of control into a bigger problem. We can prevent people from slipping on ice by putting rock salt down or making sure they have shoes with good traction. Similarly, we can prevent substance use from sliding out of control by creating healthy environments for adolescents—at home, in school, and in the broader community—and if adolescents are starting to slip into substance use, we can help them gain traction with the right supports and services. By creating environments that give adolescents traction, we can prevent substance use from sliding out of control.

Asthma

The best way to prevent asthma is to create a healthy environment by reducing things like pollution and secondhand smoke. Similarly, we can prevent adolescents from developing problems with alcohol and other drugs by creating healthy environments—at home, in school, and in the broader community. And just as health care professionals like doctors and nurses can help us create environments that prevent asthma and can treat asthma early so it doesn't become a serious problem, they can help us create environments that prevent adolescents from developing substance use problems and can treat adolescent substance use early so it doesn't turn into a bigger problem.

Treatments from the Second Experiment

VALUES

Economic Wellbeing

Reducing and preventing problems with alcohol and other drug use among adolescents is important for ensuring the economic wellbeing of our communities and our country. Drinking and heavy drug use can have negative effects on young people's achievement in school and their ability to get a good job later on as an adult. This means that when young people develop problems with alcohol or other drugs, it increases things like unemployment and poverty in the future. These problems harm the growth and productivity of our communities and our country's economy and cost a lot to address.

As a country, we need to make it a priority to reduce the use of alcohol and other drugs among young people. This will strengthen our economy and reduce the costs of unemployment and poverty. We need to create healthy environments for adolescents and increase funding for programs in schools and health clinics that can prevent and identify problems with alcohol and drug use before they get serious. Put simply, addressing adolescent substance use is important for ensuring a strong, successful economy.

Health and Happiness

Reducing and preventing problems with alcohol and other drug use among adolescents is important for ensuring the health and happiness of our communities and our country. Drinking and heavy drug use can have negative effects on young people's physical and mental health now and in the future as they become adults. This means that when young people use alcohol or other drugs, it increases things like high blood pressure, depression, and social isolation. These problems harm the overall health and happiness of our communities and our country.

As a country, we need to make it a priority to reduce the use of alcohol and other drugs among young people. This will improve our whole country's physical and mental health and make sure that we all have high levels of wellbeing. We need to create healthy environments for adolescents and increase funding for programs in schools and health clinics that can prevent and identify problems with alcohol and drug use before they get serious. Put simply, addressing adolescent substance use is important for ensuring a happy, healthy country.

Moral Responsibility

Reducing and preventing problems with alcohol and other drugs among adolescents is an important part of our moral obligation to care for our young people. Drinking and heavy drug use can have negative effects on young people's achievement in school, ability to get a good job as an adult, and physical and mental health. This means that young people who use alcohol or other drugs can suffer and damage their lives into the future, and that we have failed in our responsibility to take care of them.

As a country, we need to make it a priority to reduce the use of alcohol and other drugs among young people. This will allow us to realize and live up to our moral responsibility to support our young people. We need to create healthy environments for adolescents and increase public funding for programs in schools and health clinics that can prevent and identify problems with alcohol and drug use before they get serious. Put simply, addressing adolescent substance use is important for fulfilling our responsibility as a country to take care of our young people.

EXPLAINING PEDIATRICIANS' ROLE: MESSENGER TREATMENTS

No Messenger

Pediatricians should play a larger role in addressing alcohol and other drug use among adolescents.

Pediatricians are in a unique and important position to help reduce drinking and other drug use among younger people. They can have a conversation with adolescent patients about alcohol and other drugs during regular visits. Younger people can feel comfortable talking to a pediatrician about drinking and drug use, because unless they are in immediate danger, anything a patient tells the pediatrician can stay between them. Pediatricians can also give adolescent patients information about how drinking and drug use can affect their health. And if a patient has a problem, a pediatrician can refer them to whatever help they might need, like linking them up with a mental health professional.

All pediatricians should do things like this, so that we can prevent substance use problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

Pediatricians as Messenger

In a recent statement, the National Association of Pediatricians expressed support for pediatricians playing a larger role in addressing alcohol and other drug use among adolescents.

Many pediatricians feel that they are in a unique and important position to help reduce drinking and other drug use among younger people. Dr. Timothy Johnson, a pediatrician from the group, remarked, "I have a conversation with my adolescent patients about alcohol and other drugs during regular visits. Younger people can feel comfortable talking to me about drinking and drug use, because unless they are in immediate danger, anything my patients tell me can stay between us. I also give information to my patients about how drinking and drug use can affect their health. And if a patient has a problem, I refer them to whatever help they might need, like linking them up with a mental health professional."

The group of pediatricians recommends that all pediatricians do things like this, so that we can prevent substance use problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

Mental Health Professionals as Messenger

In a recent statement, the National Association of Mental Health Professionals expressed support for pediatricians playing a larger role in addressing alcohol and other drug use among adolescents.

Many mental health professionals feel that pediatricians are in a unique and important position to help reduce drinking and other drug use among younger people. Timothy Johnson, a mental health professional from the group, remarked, "The pediatricians I work with have conversations with their adolescent patients about alcohol and other drugs during regular visits. Younger people can feel comfortable talking to a pediatrician about drinking and drug use, because unless they are in immediate danger, anything a patient tells the pediatrician can stay between them. The pediatricians I work with also give patients information about how drinking and drug use can affect their health. And if a patient has a problem, they refer them to whatever help the patient might need, like linking them up with someone like me."

The group of mental health professionals recommends that all pediatricians do things like this, so that we can prevent substance use problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

Parents as Messenger

In a recent survey, parents expressed support for pediatricians playing a larger role in addressing alcohol and other drug use among adolescents.

Many parents feel that pediatricians are in a unique and important position to help reduce drinking and other drug use among younger people. Timothy Johnson, one of the surveyed parents, remarked, "Our pediatrician and my child have a conversation about alcohol and other drugs during regular visits. My child feels comfortable talking to our pediatrician about drinking and drug use, because unless my child is in immediate danger, anything they tell our pediatrician can stay between them. Our pediatrician also gives my child and me information about how drinking and drug use can affect my child's health. And if my child had a problem, I know that our pediatrician could refer them to whatever help my child might need, like linking them up to a mental health professional."

Surveyed parents agreed that all pediatricians should do things like this, so that we can prevent substance use problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

Adolescents as Messenger

In a recent survey, adolescents expressed support for pediatricians playing a larger role in addressing alcohol and other drug use among adolescents.

Many adolescents feel that pediatricians are in a unique and important position to help reduce drinking and other drug use among younger people. Timothy Johnson, one of the surveyed adolescents, remarked, "My pediatrician and I have a conversation about alcohol and other drugs during regular visits. I feel

comfortable talking to my pediatrician about drinking and drug use, because I know that unless I am in immediate danger, anything I tell my pediatrician can stay between us. I also get information from my pediatrician about how drinking and drug use can affect my health. And if I had a problem, I know that my pediatrician could refer me to whatever help I might need, like linking me up with a mental health professional."

Surveyed adolescents agreed that all pediatricians should do things like this, so that we can prevent substance use problems and reduce the use of alcohol and other drugs among adolescents, and keep them healthy.

Appendix C: Survey Experiment Outcome Measures

The following outcome measures were used in both survey experiments.

Note: Items were randomized within batteries. The order of batteries A through E was randomized, and policies F and G appeared after this, in order.

A. Understanding of Adolescent Substance Use as a Health Issue

1. In your view, how much of a role should each of the following groups play in dealing with adolescents' use of alcohol and other drugs? *[Randomize order of groups; 7-point Likert scale: No role at all; A very small role; A small role; A moderate role; A large role; A very large role; An extremely large role.]*

    a. Adolescents themselves
    b. Parents and families
    c. Friends and peers
    d. Educational professionals, such as teachers and school counselors
    e. Religious organizations, such as churches
    f. Primary care doctors and nurses
    g. Psychiatrists, clinical psychologists, and counselors
    h. Criminal justice officials, such as police and judges
    i. Social service providers, such as social workers
    j. Lawmakers and other elected officials

2. Using the options below, please complete the following statement so that it comes closest to your view.

    Health care providers have a(n) _____ role to play than other people in dealing with adolescents' use of alcohol and other drugs.

    a. Much smaller
    b. Smaller
    c. Slightly smaller
    d. Equal
    e. Slightly larger
    f. Larger
    g. Much larger

B. Collective Responsibility for Addressing Adolescent Substance Use

3. In your view, how much of an obligation does our society have to do something about adolescents' use of alcohol and other drugs? *[7-point Likert scale: No obligation at all; A very small obligation; A small obligation; A moderate obligation; A large obligation; A very large obligation; An extremely large obligation.]*

4. In your view, how much of a responsibility does our government have to take steps to deal with adolescents' use of alcohol and other drugs? *[7-point Likert scale: No responsibility at all; A very small responsibility; A small responsibility; A moderate responsibility; A large responsibility; A very large responsibility; An extremely large responsibility.]*

5. In your view, who has the greatest responsibility to do something about adolescents' use of alcohol and other drugs? *[Randomize order of groups; participants can select only one option.]*

    a. Adolescents themselves
    b. Parents and families
    c. Community organizations
    d. Government
    e. Other *[text entry]*

C. Collective Efficacy about Reducing Adolescent Substance Use

6. In your view, how much can our society do to reduce adolescents' use of alcohol and other drugs? *[7-point Likert scale: Nothing at all; A very small amount; A small amount; A moderate amount; A large amount; A very large amount; An extremely large amount.]*

7. How optimistic or pessimistic do you feel that our society can reduce adolescents' use of alcohol and other drugs? *[7-point Likert scale: Extremely pessimistic; Pessimistic; Somewhat pessimistic; Neither optimistic nor pessimistic; Somewhat optimistic; Optimistic; Extremely optimistic.]*

D. Understanding of Protective Factors

8. In your view, how much of an impact does each of the following have on whether or not an adolescent will develop problems with alcohol and other drugs? *[Randomize order of factors; 7-point Likert scale: No impact at all; A very small impact; A small impact; A moderate impact; A large impact; A very large impact; An extremely large impact.]*

    a. Having high self-esteem
    b. Having parents who set clear expectations for behavior

c. Getting strong support from parents when dealing with personal problems
d. Attending a school with strong anti-drug use policies
e. Having healthy peer relationships
f. Living in a community where laws restricting alcohol and other drug use are consistently enforced
g. Having supportive relationships with adults outside the family
h. Having a health care provider who gives them information about alcohol and other drug use
i. Living in a safe community
j. Having many opportunities for community engagement (e.g., volunteering, participating in sports)
k. Living in a community with strong resources (e.g., high-quality housing, health care, schools)
l. Having access to treatment for mental health issues
m. Having access to support programs for adolescents and families
n. Living in a community that limits advertising for alcohol
o. Living in a community with fewer permits to sell alcohol

E. Understanding of Effects of Substance Use on Adolescents

9. In your view, when adolescents regularly use alcohol and other drugs, how long do its effects on each of the following last? *[Randomize order of effects; 7-point Likert scale: Just as long as it is in their system; A very short amount of time; A short amount of time; A moderate amount of time; A long amount of time; A very long amount of time; An extremely long amount of time.]*

    a. Brain health, or the structure and functioning of the brain
    b. Relationships with family and friends
    c. Physical health and wellbeing
    d. Academic achievement
    e. Mental health, or psychological wellbeing
    f. Personality
    g. Emotions, or mood
    h. Motivation
    i. Participation in hobbies and activities

F. Policy Support

10. Please indicate the extent to which you would personally favor or oppose each of the following proposals about what can or should be done to deal with adolescents' use of alcohol and other drugs. *[Randomize order of statements; 7-point Likert scale: Strongly oppose; Oppose; Slightly oppose; Neither favor nor oppose; Slightly favor; Favor; Strongly favor.]*

a. Requiring health care providers, such as doctors and nurses, to be trained in how to detect and address the use of alcohol and other drugs among adolescents
b. Requiring health care providers, such as doctors and nurses, to have a conversation with all adolescents about the use of alcohol and other drugs at regular visits
c. Increasing public spending on school-based programs that educate adolescents about the use of alcohol and other drugs
d. Changing zoning laws so that liquor stores cannot be located near schools
e. Putting stricter penalties in place for adolescents who use alcohol and other drugs
f. Parents and families setting stricter boundaries so adolescents don't use alcohol and other drugs

G. Support for Public Funding of Programs

11. Below is a list of different types of programs to deal with adolescents' use of alcohol and other drugs that compete for public funding. For each one, please indicate how much you would like to see public funding increase or decrease. *[7-point Likert scale: Significantly decrease; Decrease; Slightly decrease; Keep about the same; Slightly increase; Increase; Significantly increase.]*

    a. Programs to prevent adolescents from beginning to use alcohol and other drugs
    b. Programs to identify early use of alcohol and other drugs among adolescents, so that steps can be taken to prevent increased use
    c. Programs to treat adolescents who have developed an addiction to alcohol and other drugs

About the FrameWorks Institute

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ENDNOTES

[1] See Volmert, A., Fond, M., Haydon, A., O'Neil, M., & Gerstein Pineau, M. (2016). "It's a rite of passage": Mapping the gaps between expert, practitioner, and public understandings of adolescent substance use. Washington, DC: FrameWorks Institute.

[2] *Economic Wellbeing* also had significant positive effects on the *Protective Factors* scale. Because this was not a targeted outcome and there is not a clear theoretical explanation for this effect, we do not focus on this result here.

[3] See, e.g., Lindland, E., & Kendall-Taylor, N. (2011). *People, polar bears, and the potato salad: Mapping the gaps between expert and public understandings of environmental health.* Washington, DC: FrameWorks Institute. See also O'Neil, M., Sweetland, J., & Fond, M. (2017). *Unlocking the door to new thinking: Frames for advancing oral health reform.* Washington, DC: FrameWorks Institute.

[4] See Kendall-Taylor, N. (2010). *An empirical simplifying models research process: Theory and method.* Washington, DC: FrameWorks Institute.

[5] See Volmert, A., Fond, M., Haydon, A., O'Neil, M., & Gerstein Pineau, M. (2016). "It's a rite of passage": Mapping the gaps between expert, practitioner, and public understandings of adolescent substance use. Washington, DC: FrameWorks Institute.

[6] Ibid.

[7] It is important to note that messengers can potentially matter for reasons other than credibility. We focus on credibility here because this was the aspect of messengers that we expected would be most important on this issue.

[8] The sample for this experiment was not nationally representative, but the academic literature strongly suggests that experimental effects are replicated with samples drawn from Mechanical Turk. See Mullinx, K. J., Leeper, T. J., Druckman, J. N., & Freese, J. (2015). "The generalizability of survey experiments." *Journal of Experimental Political Science 2,* 109–138.