



# Reduction of Youth Monthly Alcohol Use Using the Positive Community Norms Approach

Jeffrey W. Linkenbach<sup>1</sup> · Phyllis L. Bengtson<sup>2</sup> · Jaimie M. Brandon<sup>3</sup> · Al J. Fredrickson<sup>2</sup> · Jason R. Kilmer<sup>4</sup> · Darren T. Lubbers<sup>3</sup> · Jordan D. Ooms<sup>3</sup> · Valerie S. Roche<sup>1</sup> · Sara J. Thompson<sup>1</sup>

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## Abstract

This research evaluated the impact of the Positive Community Norms (PCN) approach on (a) correcting misperceptions of norms of peer alcohol use and (b) reducing prevalence of monthly alcohol use among a sample of high-school students. A 5-year intervention (consisting of a mix of strategies centered around promoting actual norms related to alcohol use) was implemented by community coalitions in 11 school districts selected by the Minnesota Department of Human Services. Yearly assessments of teen substance abuse norms were conducted in each community, as well as surveys of parents and adults in the community. In the absence of control communities, national data from Monitoring the Future (MTF) (Miech et al. in *Monitoring the future national survey results on drug use, 1975–2017: secondary school students, vol I* [Monograph]. Institute for Social Research, The University of Michigan, Ann Arbor, MI, 2018) were utilized as a comparison condition. At the end of the 5 years, 8th- and 10th-grade students in the PCN intervention communities were more likely to report never using alcohol than students in the MTF Survey comparison group. This finding was also true for 8th-, 10th-, and 12th-grade students combined. This research provides evidence for utilizing the PCN approach to effectively correct misperceptions of norms and integrate strategies to reduce and prevent teen alcohol use at community population levels.

**Keywords** Positive community norms · Youth alcohol prevention · Social norms · Misperceptions · Media campaign

## Introduction

Alcohol continues to be the most widely used substance by youth in the United States, with 61.5% of high school seniors, 42.2% of high school sophomores, and 23.1% of eighth-grade students reporting any lifetime use of alcohol (Miech et al., 2018). Alcohol use is associated with a range of unwanted consequences, including academic impacts, dropping out of school, social outcomes, driving-related risks, and health effects (U.S. Department of Health and Human Services, 2016; Dupont et al., 2013; White &

Hingson, 2013). Drinking by adolescents is influenced by a number of factors including alcohol-related social media engagement (Curtis et al., 2018), television, music, advertising, and other media exposure (Kilmer, Kilmer, & Grossberg, 2014), parental influences (Rusby, Light, Crowley, & Westling, 2018), enforcement of underage drinking laws (Paschall, Grube, Thomas, Cannon, & Treffers, 2012), perceived social norms (Pedersen et al., 2017), and interactions of multiple variables (e.g., media and norms) (Janssen et al., 2018). Underage drinking remains an important focus of prevention and intervention efforts across the United States (U.S. Department of Health and Human Services, 2016).

Nationally, the Monitoring the Future (MTF) survey documents teenage and young adult substance use behavior and has demonstrated a downward trend in adolescent alcohol use over the past several years (Miech et al., 2018). In 2002, rates of any use and having “been drunk” began to decline from previous years and gradually declined until 2018, when 12th-grade respondents reported their lowest ever rates of alcohol use and drunkenness (Miech et al., 2018). In 2017, there were no significant changes across any prevalence

✉ Jeffrey W. Linkenbach  
jeff@montanainstitute.com

<sup>1</sup> The Montana Institute, Bozeman, MT, USA

<sup>2</sup> Behavioral Health Division, Minnesota Department of Human Services, Minneapolis, MN, USA

<sup>3</sup> IBH Analytics, Keego Harbor, MI, USA

<sup>4</sup> Department of Psychiatry & Behavioral Sciences, School of Medicine, University of Washington, Seattle, WA, USA

measures for the first time in years, and most recent data reflect past 30-day alcohol use by 8.0% of eighth graders, 19.7% of 10th graders, and 33.2% of 12th graders, with reports of having “been drunk” in the past 30 days endorsed by 2.2% of eighth graders, 8.9% of 10th graders, and 19.1% of 12th graders (Miech et al., 2018).

Although these rates reflect underage, and therefore illicit drinking, which appropriately receives public health and legal attention, most youth are making the healthy choice to abstain from alcohol use in a typical month. Normative teenage non-use of alcohol has continued to grow over recent and long-term trends. According to the MTF Survey, alcohol use showed a significant decline between 2012 and 2017 across all grades (Miech et al., 2018). In 2017, past month use of alcohol was reported by 8.0%, 19.7%, and 33.2% of 8th, 10th, and 12th graders, respectively, compared to 11.0%, 27.6%, and 41.5% in 2012 (Miech et al., 2018). The MTF also shows that the percentage of high school teens who reported ever using alcohol dropped by as much as 60% compared to peak years in previous decades (Miech et al., 2018). The 2017 survey found that 23.1% of eighth graders reported ever trying alcohol, a 60% drop from the peak of 55.8% in 1994 (Miech et al., 2018). Among 10th graders, lifetime use fell by 40% from 72.0% in 1997 to 42.2% in 2017 (Miech et al., 2018). Among 12th graders, there was a significant 25% drop in lifetime alcohol use from 81.7% in 1997 to the current 61.5% (Miech et al., 2018).

Decades of research on social norms shows consistent misperceptions in the prevalence of those who engage in a behavior like alcohol use, and even gross misperceptions in the rates associated with that behavior (i.e., people tend to assume that more people drink than actually do, and believe that those who do drink consume more than they actually do (Perkins, 2003; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999; Perkins & Wechsler, 1996; Thombs, Wolcott, & Farkash, 1997). Such misperceptions of peer alcohol-use norms have been identified as one of the highest risk factors for teen alcohol use (Wambeam, Canen, Linkenbach, & Otto, 2014). These perceptions matter given misperceived norms are associated with people’s own substance use and even their experience of consequences (Larimer et al., 2009; Larimer, Turner, Mallett, & Geisner, 2004).

Additionally, there is evidence that misperceived social norms can be corrected (Botvin, Griffin, Diaz, & Ilfill-Williams, 2001; Haines & Spear, 1996). A great deal of research has explored personalized normative feedback, particularly among college students (Cronce & Larimer, 2011; Neighbors, Larimer, & Lewis, 2004). There have been fewer studies of social norms mass marketing campaigns (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015), in part because a primary barrier to randomized controlled trials is identifying a proper control or comparison group (e.g., researchers cannot ask half of the people in a

community to ignore ads, billboards, etc.). However, two quasi-experimental research projects conducted in Montana have demonstrated the effectiveness of directly focusing on perceptions of social norms as environmental control strategies (Linkenbach & Perkins, 2003a); Perkins, Linkenbach, Lewis, & Neighbors, 2010). Both studies measured impacts of normative behavior. The first study focused on correcting perceptions of norms related to teen tobacco use, and demonstrated a 41% difference in rates of first-time tobacco use by teens in a seven-county intervention area as compared to a 49-county control area after a one-year environmental exposure (Linkenbach & Perkins, 2003a). The second study measured significant reductions in drinking and driving behaviors in half of the state’s young adult population who were exposed to high doses of a social norms media campaign compared to the other half, who did not receive the messages (Perkins et al., 2010).

While studies such as these demonstrate the effectiveness of utilizing social norms as an environmental approach, other environmental factors can contribute to a prevention effort’s apparent success or failure. Scribner et al. (2011) found no overall effect of a social norms campaign in a study of 32 college campuses, but found that campaigns were more effective on campuses with lower alcohol retail outlet density, concluding that competing environmental messages such as signs, advertisements, and visible alcohol consumption may collectively convey a normative message and increase misperceptions of peer drinking. Thus, attention to the overall environmental context in which drinking occurs matters. However, less is known when exploring normative approaches and underage alcohol use prevention with middle school and high school-aged teenagers.

## Normative Influence Approaches

One way of preventing the underage use of alcohol is through environmental strategies to directly impact community and social norms. Social norms refer to the typical values, beliefs, attitudes, and behaviors of a group of people (Ajzen, 1991; Bandura, 1986). Although described using different definitions, social norms interventions typically seek to impact two basic types of norms: actual norms and perceived norms. Actual norms refer to those things that community members report they believe, value, and do. Perceived norms, on the other hand, are the beliefs, values, and behaviors that community members perceive the majority of other community members have or do (Perkins & Berkowitz, 1986). In the norms literature, perceived norms are typically divided into two categories as descriptive social norms (perceptions of others’ actual behaviors) and injunctive social norms (perceptions of others’ opinions of behaviors) (Cialdini, Reno & Kallgren, 1990). Social norms research often

measures the gap between actual and perceived norms, with a focus on the influence of this gap on attitude and behavior (Perkins & Berkowitz, 1986). Social norms approaches focus on correcting gaps between perceived and actual norms given that misperceptions of norms have consistently been shown to be correlated with individual risk behavior (Baer & Carney, 1993; Baer, Stacy, & Larimer, 1991; Perkins & Berkowitz, 1986; Perkins et al., 1999; Prentice & Miller, 1993).

Misperceptions of norms typically operate in two directions: (a) the over-estimation of risk and (b) the under-estimation of protections (Linkenbach, 2001). When groups of people misperceive protective health and safety norms by overestimating the prevalence of risky behavior, then risky behavior is perceived to be normal and more acceptable, which increases the likelihood that their own behavioral choices will be biased in the direction of engaging in more risky or harmful behaviors (Fleckman, Taylor, Theall, & Andrinopoulous, 2019). Conversely, accurate perceptions of the normative environment may act as a hidden protective factor that can promote healthy choices and encourage intervention (Klika, Haboush-Deloye, & Linkenbach, 2019).

Emphasizing positive community norms can have multiple impacts, even beyond the intended primary focus audience, including the delayed initiation of risky behavior. First, it is important for those teens who make the choice to abstain from using substances to know they are not alone, and, when the case, even part of a majority of students who do not use substances. Second, for those wanting to “fit in” and do what “everyone” is doing, the misperception that most are engaging in an unhealthy behavior could lead to their own initiation of use—and this effort to delay the initiation of use is the focus of universal prevention efforts (Weissberg, Kumpfer, & Seligman, 2003). Third, perceived norms of high-risk drinking are related to other risk behaviors, and given the role of heavy episodic or “binge” drinking in suicide, it has been suggested that changing perceived norms around alcohol use could decrease use and, in turn, decrease suicidal behavior (Manza & Sher, 2008). Finally, for those considering making a change in their use, a barrier could be their belief that if they cut down or quit they will be the “only one” also making this choice; correcting this misperception could support the self-efficacy of those considering a change (Miller & Rollnick, 2013). Research consistently shows that misperceptions explain variance in people’s own use and even their experience of consequences.

## The Positive Community Norms Approach

The Positive Community Norms (PCN) approach to prevention is an environmental change model that emphasizes positive norms messaging and communications as a way to

integrate multiple strategies. PCN is rooted in the Science of the Positive Framework (Linkenbach, 2013), which focuses on identifying and cultivating healthy, positive protective factors that already exist in every community in order to generate collective impacts, reduce risks and harm, and positively impact population-level norms. The Seven Step Montana Model for Positive Community Norms Communication (Linkenbach 2003) uses the Seven Core Principles of the Science of the Positive framework to grow positive norms through key skill areas of transformational leadership development, norms communications, integration of prevention strategies, and structured reflection (see Fig. 1).

PCN interventions integrate a portfolio of strategies that identify and close normative misperception gaps and increase healthy behaviors and attitudes by focusing on the healthy norm (Linkenbach et al. 2017). PCN cultivates cultural transformation by working on multiple community levels and factors at once. The PCN approach has been applied to a variety of health and safety issues including impaired driving, binge drinking, youth tobacco use, parenting norms, youth seatbelt use, and child maltreatment prevention (Linkenbach, 2006; Linkenbach & Perkins, 2003a, 2003b; Linkenbach, Perkins, & DeJong, 2003; Litt, Lewis, Linkenbach, Lande, & Neighbors, 2014; Linkenbach, Klika, Jones, & Roche, 2017; Sege, et al., 2017).

## The Minnesota PCN Project: Methods and Implementation

The Minnesota PCN (MN PCN) study examined changes in adolescent alcohol use during a 5-year PCN intervention in a 10-community cohort in Minnesota. Alcohol use rates were analyzed within the MN PCN cohort and were also compared to national drinking rate changes over time.

### Community Selection

The MN PCN intervention ran from July 2011–June 2016. It involved 10 communities, comprising 10 separate school

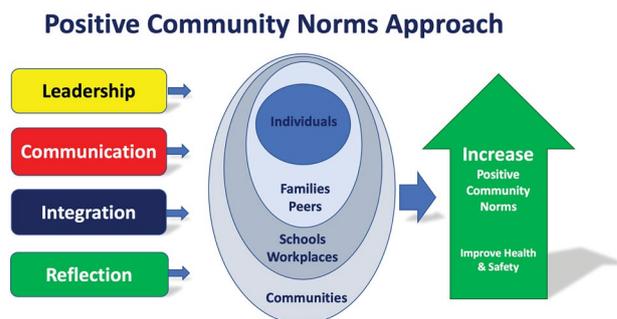


Fig. 1 PCN logic model used during this intervention

districts from across Minnesota with a wide range of demographic characteristics. Table 1 displays the percentage of students participating by ethnicity and gender for the 2013 administration of the PCN survey. Ethnicity and gender representations stayed relatively constant throughout the five-year intervention.

The communities selected all scored above the Minnesota statewide average on key alcohol and drug use measures of the Minnesota Student Survey (MSS) given to 8th-, 9th-, and 11th-grade students every three years. Each community was also required to already have or start a community coalition working to reduce underage alcohol use that met monthly and included representation from 14 community sectors. The community sectors were: Youth (18 or younger), Parents; Business, Media, Schools, Youth-Serving Organizations, Law Enforcement Agencies, Religious or Fraternal Organizations, Healthcare Professionals, State/Local/Tribal Agencies with Expertise in Substance Abuse, Civic and Volunteer Groups, Other Organizations Involved in Reducing Substance Abuse, High-Risk Sub-Populations, and Justice/Corrections.

Community coalition leaders in all 10 communities were trained by The Montana Institute in how to implement a PCN intervention by integrating a portfolio of positive, normative, environmental prevention strategies and messages. The Montana Institute provided a minimum of three in-person trainings per year, in addition to quarterly remote trainings that focused on specific implementation actions and needs. In order to focus their PCN messages and make resources last, each community worked with their high school(s) and their feeder middle schools. They also received training and technical support from Minnesota's Regional Prevention Coordinators.

All intervention media were required to feature a relevant normative message, ensuring that communications were focused on correcting misperceptions about underage alcohol use. Throughout the intervention, the PCN approach offered a common framework and positive norms narrative that was integrated into all media, and provided context with other environmental strategies including: PCN communications campaign, responsible beverage server trainings, alcohol compliance checks, alcohol policy work for community festivals, Zero Adult Providers (ZAP) program, creation of a youth group focused on community environmental change, town hall meetings, evidence-based classroom curriculum programs, programs for high-risk youth, alcohol-free activities for youth, and annual leadership and prevention trainings.

### PCN Surveys

Data were collected annually using a PCN Student Survey that was developed specifically for this project. Question items were selected in order to triangulate with other validated survey instruments such as the MTF Survey, the MSS, and the core measures of Drug Free Communities (DFC) surveys. Where possible, behavioral or attitudinal questions were matched with perception questions to create pairings of actual norms and perceptions of norms. The student surveys were administered online as census surveys in the middle and high schools, and were approved through the Montana State University and Heartland Institutional Review Boards.

Key items of analysis for this study focused on alcohol use across seven different time spans, ranging from *Never* to *Daily*. Responses were used for identifying gaps and developing intervention messages for pilot testing, as well as for

**Table 1** Percentage of students participating by race/ethnicity and gender for the 2013 Administration of the MN PCN Survey

School District	American Indian (%)	Asian (%)	White (%)	African American/Black (%)	Asian Pacific Islander (%)	Other (%)	Hispanic (%)	Male (%)	Female (%)
School District 1	3.6	2.4	89.2	–	1.8	3.0	4.6	54.3	45.7
School District 2	4.0	1.4	86.9	0.4	1.2	6.1	5.4	50.6	49.4
School District 3	29.2	0.6	65.5	0.9	–	3.7	3.1	51.5	48.5
School District 4	2.6	0.9	74.3	0.3	1.1	20.9	24.8	48.3	51.7
School District 5	3.5	1.0	84.5	1.0	–	10.0	2.0	50.2	49.8
School District 6	19.8	2.1	66.7	1.0	–	10.4	7.1	43.5	56.5
School District 7*	–	–	–	–	–	–	–	49.1	50.9
School District 8	2.7	1.4	86.4	1.0	0.2	8.3	7.9	50.1	49.9
School District 9	1.1	0.9	80.6	0.7	0.5	16.3	16.8	52.7	47.3
School District 10	2.2	2.5	79.9	1.1	0.6	13.6	9.3	50.5	49.5
School District 11	0.9	3.4	86.5	–	–	9.2	9.3	51.9	48.1
Total	5.7	1.7	80.8	0.7	0.5	10.7	8.4	50.2	49.8

\*School District 7 did not participate in the ethnicity questions for the 2013 survey

outcome evaluation. Self-reported alcohol use was evaluated using the question, “How often do you do the following? Drink one or more drinks of an alcoholic beverage (beer, wine, wine coolers, liquor).” Answer choices ranged from *Never to Daily*.

Another key analysis focused on student norms and perceptions of norms related to the acceptability of teen drinking. This was assessed through agreement with the statement, “Drinking alcohol is never a good thing for anyone my age to do.” Respondents were asked how they would feel about this statement, and also asked how they thought most students in their school would respond to it. Answer choices ranged from *Strongly Agree to Strongly Disagree*.

## PCN Context

Each community integrated a prevention strategies portfolio into a common positive norms context through PCN messaging. Middle school and high school teens were the primary audience; additional messages were also created for parents and adult community members. The primary purpose of the messages across all audiences was to correct misperceptions of norms related to teen alcohol use. Messages were integrated into strategies such as in-school media interventions, “Sticker Shock” point of sale messaging campaigns, and responsible beverage server trainings to establish a context that was clear, consistent, and pervasive related to the normative non-use of alcohol by teens. Both descriptive and injunctive norms were utilized as messages. Examples include: “MOST (85%) of XYZ high school students don’t drink in a typical month” (descriptive) and “Parents did you know? MOST (87%) XYZ high school students prefer NOT to DRINK alcohol when hanging out with friends” (injunctive).

## MTF Survey Compared to the PCN Student Survey

In the absence of a control group, this study compared the PCN Student Survey findings to national alcohol use trends by comparing measured project outcomes to trends in the MTF survey. This comparison indicates whether the changes measured were due to the intervention or the result of nationwide trends. To this end, odds ratios and p-values were calculated to find magnitude changes and to determine if the reduction in MN PCN 8th-, 10th-, and 12th-grade past lifetime drinking rates were statistically different from the beginning of the cohort to the end of the cohort. These magnitude changes were then compared to national MTF magnitude changes for 8th-, 10th- and 12th-grade lifetime drinking rates. MTF magnitude changes were also calculated using odds ratios to determine if there were significant reductions in lifetime drinking nationwide from 2012 to 2016.

Prevalence of lifetime alcohol use from the beginning of the cohort to the end of the cohort was compared with the MTF data. A Bonferroni correction was used to ensure that the findings for this comparison were not a function of multiple comparisons, resulting in an adjusted alpha level of 0.0031. Chi-square tests were conducted using data from the present study and national results to determine if changes/trends in prevalence from the current study were significantly different than national trends and changes. If significance was found, odds ratios were computed.

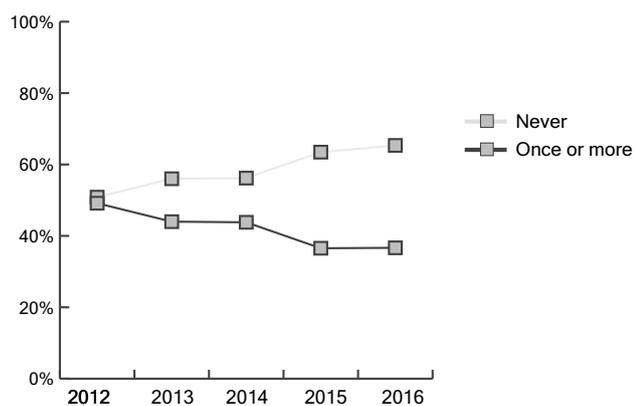
MTF data was used as a comparison for lifetime alcohol use for this evaluation through point-in-time measures. MTF has proven to be a highly reliable source for national data trends in youth and young adult substance abuse and related issues since 1975 (Miech et al., 2018). Comparisons to the national data examined 8th-, 10th-, and 12th-grade students as well as these grades combined, as MTF only collects data on these particular grades in the secondary school setting. Odds ratios and p-values were calculated to find magnitude changes and to determine if the reduction in MN PCN 8th-, 10th-, and 12th-grade past lifetime drinking rates were statistically different from the beginning of the cohort to the end of the cohort. These magnitude changes were then compared to national MTF magnitude changes, for 8th-, 10th-, and 12th-grade lifetime drinking rates. MTF magnitude changes were also calculated using odds ratios to determine if there were significant reductions in lifetime drinking nationwide from 2012 to 2016.

## Results

### Lifetime Alcohol Use/Non-Use and MN PCN Project Significant Findings

With a focus on universal prevention, primary analyses focused on lifetime alcohol use or non-use for the collective sample, followed by analyses within grade level.

At the beginning of the MN PCN intervention in 2012, 50.9% of students (6th–12th grade) reported that they had never drank alcohol. This can be compared to 65.3% of students (6th–12th grade) who reported that they have never drank alcohol in 2016 at the end of the MN PCN intervention. MN PCN Students (6<sup>th</sup>–12th grade) in 2016 were 82% ( $X^2(1) = 192.08, p < 0.001$ ) more likely to never drink compared to MN PCN students (6th–12th grade) in 2012. Figure 2 represents a cohort-level change to the question “How often do you consume alcohol?” from 2012 to 2016. As shown in Fig. 2, those students abstaining from alcohol was at 50.9%. This is almost the same percentage, 49.1%, of students who were choosing to drink alcohol in their lifetime. As time goes on, those that choose to abstain from alcohol continued to increase.



**Fig. 2** Over the span of the 5-year intervention, the percentage of students who reported abstaining from any alcohol use in their lifetime increased while the percentage of students reporting the use of alcohol one or more times during their lifetime decreased

**Table 2** Impact on lifetime alcohol use: MN PCN intervention vs. national MTF data 2012–2016

Grade	MN Odds	MN n	MTF Odds	MTF n
Eighth	2.20**	1511	1.42**	32,000
10th	1.79**	1422	1.53**	29,700
8th, 10th, and 12th combined	1.74**	4165	1.51**	25,500

\*\*Chi Square test is significant at the .001 level. Weighted counts were used for MTF data

Analyses then compared the MN PCN intervention to national MTF data as a means of determining to what degree the reduction followed national trends or were uniquely impacted by the intervention, and looked at reductions within 8th, 10th, and 12th grades. As outlined in Table 2, MN PCN eighth-grade students were 2.20 ( $X^2(1) = 45.65$ ,  $p < 0.001$ ) times more likely to never drink in 2016 compared to 2012, whereas national eighth-grade students were only 1.42 ( $X^2(1) = 193.56$ ,  $p < .001$ ) times more likely to never drink in 2016 compared to 2012. MN PCN 10th-grade students were 1.79 ( $X^2(1) = 29.05$ ,  $p < 0.001$ ) times more likely to never drink in 2016 compared to 2012, whereas national 10th-grade students were 1.53 ( $X^2(1) = 34.26$ ,  $p < 0.001$ ) times more likely to never drink in 2016 compared to 2012. Lastly, MN PCN students (8th-, 10th-, and 12th-grade students) were 1.74 ( $X^2(1) = 76.47$ ,  $p < 0.001$ ) times more likely to never drink in 2016 compared to 2012, whereas national students were 1.51 ( $X^2(1) = 929.38$ ,  $p < 0.001$ ) times more likely to never drink in 2016 compared to 2012.

Communities that were involved in the MN PCN project were more likely to never drink than the national MTF comparison from 2012 to 2016. It can be observed that the magnitudes of reductions in lifetime drinking over time for MN PCN

students from 2012 to 2016 were larger for 8th-grade students, 10th-grade students, and 8th-, 10th-, and 12th-grade students combined than the change in magnitudes for national MTF for 8th-grade students, 10th-grade students, and 8th-, 10th-, and 12th-grade students combined. When it comes to lifetime use from 2012 to 2016, it was found that the magnitude of reduction for MN PCN 12th-grade students was not different from the magnitude of reduction for MTF 12th-grade students.

### Correcting Misperceptions of Peer Alcohol-Use Norms

In order to analyze the relationship between attitudes or injunctive norms with actual alcohol use, this study also examined changes in monthly drinking over the 5-year period. Monthly drinking is defined as those students who stated they consume alcohol once a month, twice a month, once a week, or daily. Students who stated they drank alcohol once or twice a year, tried once or twice, or never were considered to have drunk less than monthly.

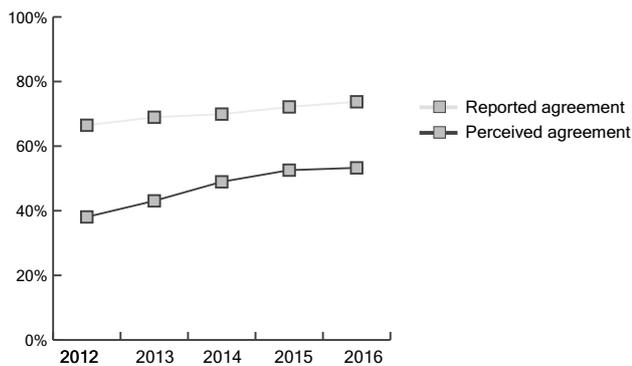
At baseline, when asked to think how they felt about the statement “Drinking alcohol is never a good thing for anyone my age to do,” students in 2012 were 2.69 ( $X^2(1) = 118.35$ ,  $p < 0.001$ ) times more likely to drink less than monthly if they chose *Strongly Agree* or *Agree*, compared to those who chose *Neither*, *Disagree*, or *Strongly Disagree*. This finding is statistically different from students in 2016 who were 4.29 ( $X^2(1) = 190.24$ ,  $p < 0.001$ ) times more likely to drink less than monthly if they chose *Strongly Agree* or *Agree* to the statement above, compared to those who chose *Neither*, *Disagree*, or *Strongly Disagree*.

### Closing the Gap Between Perceived and Actual Norms

Figure 3 shows how the MN PCN project reduced the gap between misperceptions of peer drinking norms and actual drinking norms. In 2012, the gap between reported and perceived acceptance of peer alcohol use was 28.28%. By the end of the 5-year intervention in 2016, the percentage of students accurately perceiving that most students believe that “Drinking is never a good thing for anyone my age to do” had increased, and the gap between perceived and actual norms had shrunk to 20.45%. In short, the perceptions of the norms of non-use of alcohol became more accurate, and fewer teens were drinking.

### Discussion

Decades of research show that perceptions of other people’s behavior can affect one’s own behavior, and that correcting misperceived norms can have a subsequent impact on



**Fig. 3** Reported and perceived agreement with “drinking alcohol is never a good thing for anyone my age to do”

behavior (Perkins & Berkowitz, 1986; Perkins et al., 1999). One means of correcting misperceived norms is the PCN approach, a model that emphasizes positive norms messaging that emphasizes the healthy behavior of the majority (Linkenbach, 2003, 2013). The current study evaluated a PCN intervention with middle and high school students, and showed an impact on lifetime alcohol use, monthly alcohol use, and the gap between perceived and actual norms. Without a true control group, use of a separate data set, the MTF survey, allowed for comparisons to be made to provide context for the observed decreases, and showed that changes over time exceeded national trends in the anticipated direction during the same window, with the same age cohorts. The findings demonstrate positive and significant change from the beginning of the cohort to the end, and, consistent with studies of norms-based prevention efforts, suggests that correcting misperceptions of alcohol norms among middle and high school students in the project communities impacted their actual alcohol use.

These findings extend the scientific literature and suggest that using the PCN approach, by integrating strategies through norms communications, can be an effective environmental prevention model for working across statewide populations coordinated through a cohort approach. Consistently, years of research on outcome effectiveness demonstrate that multiple strategies generally work better in community prevention trials than single strategy interventions (e.g., NIAAA’s College Alcohol Intervention Matrix stresses that a mix of strategies will maximize effects). The PCN approach can serve as a framework to integrate different strategies across a prevention portfolio that includes a normative messaging campaign, policy development through local social host ordinances, point of alcohol sale warning labels, student peer group activities, and other activities.

This study, like others before it (e.g., Botvin, et al., 2001), demonstrated that correcting misperceptions of norms matters for reducing youth alcohol use. Central to

the interventions in each of the communities was a highly visible framework of normative messages that focused on increasing accurate norms perceptions associated with peer, parent, and community disapproval of youth alcohol use, and the fact that most youth do not drink in a typical month. This research demonstrates strong positive correlations between reducing misperceptions of peer alcohol norms and reductions in youth alcohol use.

While the results are promising, they must be considered and interpreted alongside several limitations. First, without a control group, it is not possible to confidently conclude that it was the PCN approach alone that accounted for the observed findings. Second, if the PCN approach was responsible for the measured changes, further research is needed to identify what elements or combination of elements accounted for these changes. The PCN model requires that multiple community activities take place throughout the intervention; the entire package of activities could have contributed to the results. That said, reductions were observed in the very outcome variables targeted in the PCN intervention. Third, communities were able to run campaigns that best meet the needs and climate of their community, meaning that while general content was the same, it was not a universal/uniform message, though all used a message frame that, “most youth do not drink in a typical month.” Fourth, message saturation, or dosage, was not measured across this project since individual communities had individual messages and communication plans. This study was not able to control for the impact of dosage, message content, or actual exposure to PCN campaigns. Thus, future studies would benefit from more rigorous fidelity and process measures. Such measures could include matched control groups as well as developing and implementing identical messages and communication plans aimed at achieving common awareness targets. Future research could control for dose effects and consider the impact of uniform implementation of messages and dosing. Lastly, this study’s methodology included the utilization of cross-sectional data which have limitations associated with bias, population differences, and sample representativeness. Like many studies, this study utilized self-report data which have some limitations. However, administration conditions of anonymity and voluntary participation were utilized to increase validity and reliability of self-report data.

## Implications

This study’s research provides several implications for the field of public health, as well as for social work policies, practices and future research. This research supports core public health and social work theory and practice, and focused on correcting normative misperceptions across different community sectors as seen in ecological systems

theory (Bronfenbrenner, 1979). It is a strong example of the power of enhancing (normative) protective factors as seen in the risk and resilience focus of the Communities That Care (CTC) framework (Hawkins, Catalano, & Miller, 1992).

The implications of this study also closely align with some of The 12 Grand Challenges for Social Work, a groundbreaking project that champions social progress powered by science, initiated by the American Academy of Social Work & Social Welfare (AASWSW) in 2016. The 12 Grand Challenges is a call to action for social work researchers and practitioners to address some of our largest and most difficult social problems through science and collaboration. This study holds implications for three of these Grand Challenges.

The first Grand Challenge is to ensure the healthy development of all youth across different levels of risk and protections needs. The PCN approach works to reframe risk and protective data in order to promote PCN across populations. The current study focused on all teenage youth in participating middle and high schools and demonstrated a population-level approach for impacting school-wide social norms. Although this study did not employ them, targeted efforts could be directed toward selective and indicated populations to align with the three levels of prevention and intervention efforts (Mrazek & Haggerty, 1994).

Based upon the effectiveness of the PCN study, a challenge exists for exploring ways to “scale up” prevention efforts by expanding the interventions across multiple schools and communities in order to achieve population-wide reductions in teen alcohol use. Implementing and sustaining PCN interventions at scale will require new strategies for coordinating efforts in community-level systems to monitor risks, protections, perceptions, and behavioral-health outcomes to achieve and sustain results. In order to move in this direction, additional research is needed to determine minimal message dosage levels required to measure effective change.

Another of the 12 Grand Challenges is harnessing the power of technology for good. Information and communication technology (ICT) have the potential to be transformational in its power to connect, apply, deliver prevention and intervention programs, and create ways to rethink public health and social work practice (Berzin, Singer, & Chan, 2015). The possibility for practice innovation through digital technologies has been documented (e.g., Barak & Grol, 2011), and has the potential to dramatically shift and enhance social work practice in the coming decade. Integrating technology into social work and creating practice innovations through ICT can make social change and transformation possible at exponential levels. Web-based normative feedback has demonstrated effectiveness at reducing high-risk alcohol use at collegiate levels (Cronce, Bittinger, Liu, & Kilmer, 2014) and similar technological applications

could be explored for taking PCN prevention and intervention efforts into public school and community-wide settings.

Lastly, a caution and an opportunity connect with a third Grand Challenge, that of inadvertently creating social stigma around norms efforts that are not well pilot tested with all populations. Stigmatization is a social-cultural process that begins with groups being identified and ascribed negative characteristics or stereotypes (Corrigan, 2004) stemming from the exercise of power of a dominant group (i.e. the campaign developers) over less powerful groups (Link & Phelan, 2001). The harmful results stem from one group forming negative stereotypes about another group based on generalizations, misinformation, attitudes, and beliefs. This negative stigma results in blame, bias, and discrimination against the stigmatized group, which is manifested through overt or covert words, social marketing images, actions, or policies, whether done consciously or unconsciously. This social stigmatization can be internalized by individuals in the stigmatized group, resulting in self-stigma, whereby an internalized societal view of a group norm adversely influences self-perception (Corrigan & Watson, 2002). Stigma can negatively impact and affect the life opportunities of individuals and groups in many adverse ways, including health outcomes, academic achievement, income, and the likelihood of criminal involvement (Link & Phelan, 2001; Major & O'Brien, 2005). A challenge exists for exploring how to carry out selective and indicated interventions that focus on children, adolescents, and young adults at elevated levels of risk or problem involvement without initiating harmful stigmatization of individuals and groups. PCN programs with a universal prevention focus might have the potential to minimize such stigmatization by focusing on inclusivity.

## Conclusions

The data reported in this article used the standard method of reporting the percentages of youth who state engaging in the risky behavior of drinking, rather than percentages and positive norms of those who do not drink. This is an important distinction and one that is at the heart of the paradigm shift that is the PCN approach. For example, as noted earlier in this article, according to the MTF Survey, alcohol use showed a significant decline between 2012 and 2017 across all grades. In 2017, past month use of alcohol was reported by 8.0%, 19.7%, and 33.2% of 8th, 10th, and 12th graders, respectively (Miech et al., 2018). Instead, viewing these same numbers through the PCN framework reveals the positive norms that 92.0%, 80.3%, and 66.8% of 8th, 10th, and 12th graders respectively, are not using alcohol monthly. Both of these views are true—one is from a risk-based perspective, and the other is from a positive

norms-oriented context. As described in this paper, context and norms matter.

Despite potential limitations, the current study demonstrates that in communities where the PCN approach was implemented, significant reductions in youth alcohol use were measured. PCN integrates a portfolio of prevention strategies around core skills, strategies, and messages centered around reflecting accurate perceptions of peer substance non-use norms. The PCN approach can be taught to community leaders in statewide settings. Most important for future work is that the present study demonstrates that the Science of the Positive Framework can be used as the foundation for teaching the PCN approach to coalition leaders, who can then implement and integrate effective community-wide PCN prevention portfolios in their communities.

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## Compliance with Ethical Standards

**Conflict of interest** The lead author (Jeffrey W. Linkenbach) discloses potential conflict of financial interest because his business, The Montana Institute, LLC was funded by Minnesota Department of Human Services to provide training and consultation as part of this study.

**Informed Consent** This study used a passive consent protocol. Parents and guardians of the student subject pool were provided detailed information about the survey through their participating public schools’ administration and offered the opportunity to remove their child(ren) from participation.

**Research Involving Human Participants and/or Animals** The survey protocol and instrument used in this project were approved by an Institutional Review Board as being appropriate for human subjects research. The survey was voluntary and the student subject could not be compelled to take the survey, were not be provided an incentive for taking the survey, and were not penalized for opting out of the survey. Students took the survey in groups and were reminded not to put their name on the survey. The surveys were placed in envelopes and not reviewed by any local personnel. All reports only provided summary information; information was never provided by ethnicity. Individual responses were never made available to school or local personnel.

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