Evaluating Non-Response Bias in a Parent-Based College Alcohol Intervention

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Abstract

The purpose of this study was to address a dearth in the literature on non-response bias in parent-based interventions (PBIs) by investigating parenting constructs that might be associated with whether a parent volunteers to participate in a no-incentive college drinking PBI. Incoming first-year students ($N = 386$) completed an online questionnaire that included items assessing plausible predictors of participation in a PBI (students' drinking, perceptions of parents' harm-reduction and zero-tolerance alcohol communication, whether parents allowed alcohol, and changes in parents' alcohol rules). Four months later, all parents of first-year students at the study university were invited to join the PBI, which was described as a resource guide to teach them how to help their student navigate the college transition and prepare them for life at their university. Parents who signed up for the intervention used greater harm-reduction communication than those who did not sign up, were more likely to have allowed alcohol use, and signing up was significantly associated with student reports that fathers became less strict toward drinking after high school. Students' drinking and zero-tolerance communication did not significantly differ between the groups. Results indicate that non-response bias can be an issue when utilizing a real-world, non-RCT recruitment approach to invite parents into a PBI (i.e., non-incentivized, inviting all parents). Findings suggest that more comprehensive recruitment strategies may be required to increase parent diversity in PBIs.

Keywords: Parent-based intervention; alcohol use; college; non-response bias; harm reduction; zero tolerance

1 Introduction

Non-response bias, defined as when a fundamental characteristic difference exists between responders and non-responders to a study invitation (Sedgwick, 2014), is a common issue in health research (e.g., Anderman et al., 1995; Näslund et al., 1994; Pacala et al., 1996). This type of bias has not been adequately investigated in parent-based interventions (PBIs) for college students. College drinking PBIs are delivered before students move to campus and include information about the risks associated with college drinking, tips for improving parent-child communication, and behaviors parents can engage in (e.g., clear disapproval of drinking) to reduce their students' alcohol-related risks (e.g., Turrisi et al., 2001; LaBrie et al., 2022). Out of the 11 previous PBI trials in the literature (Donovan et al., 2012; Fernandez et al., 2011; Ichiyama et al., 2009, LaBrie et al., 2014, 2016; Napper et al., 2016; Testa et al., 2010; Turrisi et al., 2001, 2009, 2013; Wood et al., 2010), only two examined whether parents who volunteered to participate differed from those who did not (Turrisi et al., 2001, 2009). These findings indicate that parent participants and nonparticipants did not differ on their opinions about general health issues (e.g., "Do you think that the speed limit on major highways should be changed from 75 to 85?"; Turrisi et al., 2001, p. 367). Additionally, signing up was not associated with students' self-reported drinking (Turrisi et al., 2009).

Although these previous findings provide some evidence that parent and student samples do not appear to differ from the populations from which they are drawn, the constructs used to assess non-response bias previously may not be the most relevant to parents' decisions to participate in a PBI. For example, parenting constructs aimed at guiding students' alcohol use (e.g., parent communication) may be more closely associated with signing up to participate in a PBI than are their opinions about general health topics not directly relevant to their students'

wellbeing and their students' self-reported alcohol use, which parents typically underestimate (e.g., Bylund et al., 2005; Livingston et al., 2010). Thus, the current study extends the literature on non-response bias in college PBIs by exploring whether parents who sign up for a PBI differ from those who do not on parenting constructs that are often targeted in these interventions to influence students' drinking (e.g., alcohol communication).

Outside of the college drinking literature, parents' perceptions of risk have been shown to be associated with greater willingness to volunteer their children to participate in health interventions. For instance, parents' perceptions of a disease as risky are associated with greater willingness to inoculate their children against that disease (Bedford & Lansley, 2007; Brown et al., 2010; Cassell et al., 2006). Applying this logic to college drinking PBIs, parents who perceive college as risky to their student's health and well-being may be more likely to take steps to mitigate these risks, of which there are plenty (e.g., heavy drinking; Schulenberg et al., 2020). This may include communicating with their child about drinking (Napper et al., 2015) and, plausibly, participating in a PBI that is advertised as being designed to help parents learn how they can prepare their student for life at their university.

Harm reduction and zero tolerance are two common themes that emerge in parents' alcohol-related communication that can be targeted in PBIs (e.g., Turrisi et al., 2001) and may also influence interest in participating in these programs. Zero tolerance is unidimensional in that it simply involves parents not approving of or condoning alcohol use, while harm reduction is comprised of a nearly limitless combination of strategies that parents can communicate, all in the spirit of minimizing and reducing alcohol use and risk (e.g., if you drink... stick with your friends, call me if you need a ride; Abar et al., 2012; Bourdeau et al., 2012; LaBrie et al., 2015; Napper, 2019). Children of parents who use zero-tolerance communication are less likely to

drink (LaBrie et al., 2015) and, among light drinkers, drink less and experience fewer consequences than children of parents who use harm-reduction communication (Napper, 2019). Recent research has also revealed that, among parents of college-aged young adults, those who primarily used harm-reduction communication (compared to zero-tolerance) reported greater motive to communicate to teach safe drinking practices (e.g., I have spoken to my child about alcohol to help my child learn how to drink in moderation), while those who primarily used zero-tolerance communication (compared to harm-reduction) reported greater motive to communicate to prevent their child from initiating drinking (e.g., I have spoken to my child about alcohol because I don't want my child to start drinking; Napper et al., 2022).

Based on this research, it seems plausible that the more a parent communicates harm-reduction strategies or zero-tolerance messages, the more utility they might find in a PBI as they may be more motivated to communicate with their student about alcohol and interested in learning how they can improve their approach. Thus, parents who sign up for a PBI may use more harm-reduction and zero-tolerance communication than parents who do not sign up. Alternatively, it is also plausible that parents who volunteer to participate in the PBI use less harm-reduction and zero-tolerance communication than those who do not sign up since those higher on these constructs may believe that their current communication is sufficient to protect their student from perceived alcohol-related risks and thus are not interested in signing up. Regardless of the directionality of the associations between these intervention-related parenting constructs and signing up for a PBI, identifying differences between parents who do and do not volunteer to participate in such programs is important so future PBIs can modify their recruitment efforts to target those less likely to join and, in turn, improve the representativeness of their samples.

1.1 Current Study

The current study used a longitudinal design to, for the first time, explore whether parents who signed up to participate in a PBI, without receiving a monetary incentive to do so, differed from those who did not sign up on alcohol communication strategies and related parenting constructs (i.e., allowing drinking; Napper, 2019). The association between parent sign-up status and students' self-reported alcohol use was also investigated to verify previous findings (i.e., parent sign-up status was not associated with student drinking; Turrissi et al., 2009). Incoming first-year students participated in an online survey prior to their parents receiving an invitation to sign up for an online PBI. This intervention was promoted in invitations to parents as a resource guide to teach them how to help their first-year student navigate the transition to college and did not mention alcohol use (see LaBrie et al., 2022). We employed this approach to appeal to a wider audience and to reduce psychological reactance (Brehm, 1966) that could diminish interest in the program among parents who do not perceive alcohol to be a risk to their child.

2 Method

2.1 Recruitment and Study Procedures

Incoming first-year students (aged 17–20) who had a parent/guardian email on file at the study university's admissions office were emailed an invitation in August 2020, two weeks prior to the start of their fall semester, to participate in an online survey assessing the college transition. Students received \$20 for their participation. Three months after the start of the semester (December 2020), all parents/guardians of incoming students were emailed an invitation to join the PBI program. All procedures were IRB-approved and informed consent was obtained from participants over 18 and the parents of participants under 18.

2.2 Participants

Participants were 386 first-year students at a private, mid-sized university on the west coast of the United States ($M_{\text{age}} = 17.99$, $SD = 0.38$). The sample was racially and ethnically diverse and representative of the university's student body (58.3% White/Caucasian, 18.9% multiracial, 14.2% Asian, 6.0% Black/African American, 1.0%, Native American/Alaskan Native, 1.0% Native Hawaiian/other Pacific Islander, 0.5% unreported; 24.9% Hispanic/Latino).

2.3 Measures

2.3.1 Student Drinker Status

Participants were assigned to one of three drinking groups based on whether they reported ever trying more than a sip/taste of alcohol and their drinking in the past 30 days: never tried alcohol, past 30-day abstainer, and past 30-day drinker.

2.3.2 Perceived Parenting Constructs

2.3.2.1 Harm-Reduction and Zero-Tolerance Communication

Participants rated how similar/different three harm reduction and four zero tolerance statements were to what their parent(s) would say to them. Harm reduction statements were: *If you drink... (1) try not to be stupid; (2) you must stay with your friends; and (3) you must have a way to get home safely (e.g., designated driver, Uber/Lyft/Taxi)*. Zero tolerance statements were: *(1) You are not allowed to drink; (2) You can't drink before 21; (3) Don't drink; and (4) I don't want you to drink*. Response options ranged from *Not something they would ever say* (1) to *Exactly what they would say* (7). Mean scores were calculated for each subscale to create composite variables for harm-reduction ($M = 4.36$, $SD = 1.54$, $\alpha = .72$) and zero-tolerance ($M = 3.31$, $SD = 2.00$, $\alpha = .93$) communication.

2.3.2.2 Parental Allowance of Alcohol

Participants reported the number of drinks their parent(s) would allow them to consume on a typical occasion during the next year (Wood et al., 2004). Response options ranged from 0 to 12+ *drinks* that were then converted to a dichotomous variable (0 drinks = parents would not allow drinking; 1+ drinks = parents would allow drinking).

2.3.2.3 Changes in Mother/Father Drinking Rules

Participants indicated whether they agreed/disagreed with the statement that their parents had become less strict about alcohol use since they graduated high school. Response options ranged from *Strongly disagree* (-2) to *Strongly agree* (2) and the item was asked for both mothers ($M = 0.18$, $SD = 1.25$) and fathers ($M = 0.10$, $SD = 1.24$).

2.4 Analytic Strategy

Chi-square analyses were conducted to examine the associations between parents signing up for the PBI (vs. not signing up) and categorical variables. Independent samples *t*-tests were conducted to examine associations between parents' PBI sign-up status and continuous variables.

3 Results

3.1 Preliminary Analyses

Consistent with pre-pandemic literature, using greater harm-reduction communication, perceiving one's parents as allowing drinking, and parents becoming less strict about alcohol were all significantly associated with being a drinker. Greater perceived zero-tolerance communication was significantly associated with never having tried alcohol ($ps < .05$).

3.2 Main Analyses

As illustrated in Table 1, approximately 24.6% ($n = 95$) of students had a parent sign up to participate in the PBI. Among these, the majority had one parent sign up (91.6%), and having only a mother in the program was more likely than having a father or both parents, $\chi^2(2) = 70.88$,

$p < .001$. Students who did and did not have a parent sign up did not differ significantly on any of the demographic variables or on student drinker status ($ps > .05$). Parents who signed up were significantly higher on harm-reduction communication than parents who did not sign up. Parents who signed up were also significantly more likely to have allowed alcohol use and signing up was significantly associated with student reports that fathers became less strict toward drinking after high school (see Table 1). Zero-tolerance communication did not significantly differ based on parent sign-up status.

[TABLE 1 HERE]

4 Discussion

The current study examined non-response bias in a college alcohol PBI using a real-world recruitment strategy. Our findings illustrated that inviting parents directly to participate in a PBI, without their student nominating them to participate and without offering parents incentives, produced non-response bias such that parents who signed up for the program engaged in more harm-reduction communication and were more alcohol permissive than those who did not. These results have broad implications for the recruitment of parents into PBIs. Specifically, the similarities between the current study and research on vaccines (Bedford & Lansley, 2007; Brown et al., 2010; Cassell et al., 2006)—in both, perceptions of risk are likely an important determinant in predicting whether a parent will participate—suggests that these findings will generalize to other programs designed to help parents better their child's well-being. Although we cannot determine parents' reasons for signing up for the PBI, finding differences between parents who did and did not participate is an important first step in determining what variables may predict PBI participation.

Results from this study pertaining to students' alcohol use were also consistent with previous work which suggests students' self-reported drinking is not associated with whether a parent signs up for a PBI (Turrisi et al., 2009). Replicating this non-significant association between students' self-reported drinking and parents' sign-up status provides evidence that the current sample and previous ones may not have been much different. Thus, it seems likely that a similar pattern of non-response bias could have been identified in previous studies if they investigated such bias using parenting measures such as the ones included here (e.g., harm-reduction and zero-tolerance communication). However, future studies are needed to verify the current results in PBI studies that include participation incentives for parents in order to rule out payment as a factor that might affect non-response bias. Examining this would provide a clearer understanding of the role incentives play in non-response bias. Investigating non-response bias in future studies should not be burdensome since PBI RCTs typically pay parents to participate, should be attempting to rule out non-response bias in their parent samples, and often collect student reports of their parents' behaviors (Napper et al., 2016; LaBrie et al., 2016; Testa et al., 2010; Turrisi et al., 2001; Varvil-Weld et al., 2014; Wood et al., 2010) which can be used for these evaluations.

Although the current findings are positive in that parents who might benefit most from this PBI signed up for it (e.g., parents who allow alcohol; Abar et al., 2009), it is plausible that participating parents would differ from nonparticipating parents in different ways depending on the PBI RCT recruitment procedure. There are currently three different recruitment strategies employed in the PBI literature: (1) integrating the intervention into a university's in-person parent summer orientation program (LaBrie et al., 2016); (2) inviting parents to receive PBI materials and then recruiting students to complete a survey (Donovan et al., 2012; LaBrie et al.,

2022; Turrise et al., 2001, 2010); and (3) inviting students to complete a survey and then recruiting just the parents of the participating students to receive the PBI materials (Cleveland et al., 2012; Dumas et al., 2013; Fernandez et al., 2011; Grossbard et al., 2010, 2016; Ichiyama et al., 2009, LaBrie et al., 2014, Mallett et al., 2010; Napper et al., 2016; Testa et al., 2010; Turrise et al., 2009, 2013; Varvil-Weld et al., 2014; Wood et al., 2010). All three of these have the potential to produce different patterns of non-response bias. For instance, the first method may produce non-response bias related to factors that might be associated with whether a parent attends the in-person orientation (e.g., helicopter parenting, socioeconomic status). The second method, which was used here, resulted in parents who signed up being those who used more harm-reduction alcohol communication and who were more likely to allow drinking compared to those who did not sign up.

Finally, the third recruitment strategy, which is the one most often used in RCTs, may result in parents who participate being higher in zero-tolerance and lower in harm-reduction communication than parents who do not participate because the types of students who are likely to have these types of parents (i.e., non-drinkers or low-risk drinkers; LaBrie et al., 2015) may be the same ones who would be more open to inviting their parents to a program that could limit their drinking. In contrast, the heaviest drinking students (whose parents typically endorse using harm-reduction communication; Abar et al., 2012) may be less open to inviting their parents to participate in a PBI because they would not want their parents interfering with their alcohol use. If this is the case, one possible solution to mitigate the non-response bias observed here (in a PBI that used a real-world recruitment strategy) would be to both invite all parents directly and incentivize students to personally invite their parents. This approach should attract both parents who are intrinsically motivated (e.g., because of their perceptions of alcohol as posing a risk to

their student) and who may require extrinsic motivation (e.g., because their student invited them to participate) to sign up for a PBI.

4.1 Limitations and Future Directions

One limitation of the present study was that parenting behaviors were based on student reports. However, students' reports of parent behaviors and attitudes are considered better predictors of student drinking than are parents' own reports (Varvil-Weld et al., 2013). Additionally, because the current study utilized student-reported variables, no information could be collected about the parents who signed up for the PBI but whose students did not participate in the survey. Although the recruitment method utilized in this study is an improvement over previous PBI strategies in that data about nonparticipating parents were collected, using student-reported variables prevented us from learning whether parents who volunteered but whose students opted not to participate differed from other participating or nonparticipating parents whose students completed the survey. To evaluate non-response bias in college drinking PBIs most comprehensively, future PBI studies should consider collecting both student- and parent-reported parenting behaviors as well as perceptions of alcohol as risky to their student, which may be a strong predictor of whether a parent signs up (e.g., Bedford & Lansley, 2007; Brown et al., 2010; Cassell et al., 2006; Napper et al., 2015).

Although some students in the current sample required parental consent to participate, it is unclear whether the current findings would generalize to studies in which parental consent is required for all child participants (e.g., RCTs assessing PBIs for adolescents). To verify whether the pattern of results observed here generalizes to PBIs designed for parents of minors, future studies should be conducted to investigate non-response bias using similar variables to the ones used here.

The PBI recruitment procedure utilized here may have affected how parents responded to the program's invitation because the intervention was advertised as a general resource guide for parents without specifically mentioning college drinking. This may have influenced both parents' responses to the intervention and interaction with the materials once signed up. Given that we found a significant difference in drinking-related harm-reduction communication even though college drinking was not described in the invitation, having disclosed the alcohol focus of the intervention would have likely resulted in stronger effects than those demonstrated here. Nevertheless, non-response bias should be examined in future PBIs that are clear in their intention to improve parent-student alcohol communication.

Lastly, the study took place amid the COVID-19 pandemic which may have affected the current results. For one, given that student drinking decreased during the pandemic (Jackson et al., 2021), students' drinker status as well as parents' alcohol communication and parenting behaviors may have been different from what would otherwise have been observed. Although our parenting measures were associated with alcohol use as expected, future studies should examine the current associations under more typical circumstances. Also, the current intervention was offered to parents later in the semester than what would have typically occurred because the pandemic prevented students from living on campus during the fall semester. However, delivering the intervention when we did was still in line with when other PBIs have been given (i.e., before students transitioned to living on campus) and thus parents likely still perceived the PBI to be relevant. Future PBI studies, especially those conducted outside of the COVID-19 pandemic, should examine the current associations to verify the observed effects.

4.2 Conclusion

The current study provides initial evidence that participation in real-world uncompensated PBIs may be biased, with parents who sign up being those who use more harm-reduction communication and are more likely to allow drinking than those who do not sign up. As such, the PBI recruitment strategy employed here appears to be attracting parents of students who may be more likely to drink during college. These findings suggest that in designing population-based PBIs for dissemination, those in charge of recruiting parents into these programs must consider how to best attract all types of parents.

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Table 1. Differences between students who did and did not have parents sign up for the PBI.

	Overall (<i>N</i> = 386)		Parent signed up (<i>n</i> = 95)		Parent did not sign up (<i>n</i> = 291)		χ^2 or <i>t</i>	<i>p</i>
	<i>N</i> or <i>M</i>	% or <i>SD</i>	<i>N</i> or <i>M</i>	% or <i>SD</i>	<i>N</i> or <i>M</i>	% or <i>SD</i>		
Age								
Under 18	27	6.99	2	2.11	25	8.59		
18	333	86.27	88	92.63	245	84.19	5.30	.071
19	26	6.74	5	5.26	21	7.22		
Sex								
Male	137	35.49	40	42.11	97	33.33		
Female	249	64.51	55	57.89	194	66.67	2.41	.121
Race								
White	225	58.59	62	65.26	163	56.40		
Non-white	159	41.41	33	34.74	126	43.60	2.31	.128
Ethnicity								
Hispanic/Latino	96	24.87	20	21.05	76	26.12		
Not Hispanic/Latino	290	75.13	75	78.95	215	73.88	0.98	.321
Living status								
Living with parents	24	6.22	4	4.21	20	6.87		
Not living with parents	362	93.78	91	95.79	271	93.13	0.87	.351
Drinker status								
Never drank	103	26.68	25	26.32	78	26.80		
Abstainer	111	28.76	26	27.37	85	29.21	0.18	.915
Current drinker	172	44.56	44	46.32	128	43.99		
HR communication	4.36	1.54	4.69	1.48	4.23	1.55	2.37	.018
ZT communication	3.31	2.00	3.04	1.89	3.40	2.03	-1.58	.117
Perceived drinking limits								
Do not allow alcohol (0 drinks)	122	31.69	21	22.34	101	34.71	5.02	.025

Allow alcohol (1+ drinks)	263	68.31	73	77.66	190	65.29		
Mother rules change	0.18	1.25	0.35	1.08	0.12	1.29	1.53	.128
Father rules change	0.10	1.24	0.45	1.01	-0.01	1.28	3.11	.002

Note: HR communication = harm-reduction communication; ZT communication = zero-tolerance communication.