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Abstract

We used short message service surveying (SMS) with 150 homeless youth to examine the time ordering of feeling depressed with drinking alcohol, using marijuana, and using substances with friends. Multilevel binary logistic regression results revealed that youth who were depressed earlier in the day were more likely to drink alcohol later that day. Among depressed youth, heterosexual youth were less likely to drink alcohol than lesbian, gay, and bisexual (LGB) youth. Depressed youth had increased odds of using marijuana by a factor of 1.6, while heterosexual youth, compared to LGB youth, were 80% less likely to use marijuana. Females were 82% less likely and heterosexual youth 75% less likely to use substances with friends compared to males and LGB youth, respectively. These findings improve upon prior retrospective studies by using SMS to understand time ordering between feeling depressed and substance use in the same day.

Keywords

alcohol; marijuana; homeless youth; peers; short message service surveying

According to the National Network for Youth (2018), between 1.3 and 1.7 million youth have experienced at least one night of being homeless within a specific year. Furthermore, "Youth are the fastest growing segment of people experiencing homelessness and may be at greater risk for homelessness than any other age group" (Substance Abuse and Mental Health Services Administration, 2016:1). Youth experiencing homelessness have high rates of substance use (Hadland et al., 2011) and poor mental health such as depression (Brown, Begun, Bender, Ferguson, & Thompson, 2015) and substance use and depression are positively associated (Hadland et al., 2011). If left unchecked, substance use may lead to further adverse mental health consequences (Kidd & Carroll, 2007) and prolonged substance misuse (Thompson, Bender, Ferguson, & Kim, 2015).

Direct all correspondence to Dr. Kimberly A. Tyler, University of Nebraska-Lincoln, Department of Sociology, 717 Oldfather Hall, Lincoln, NE, 68588-0324. Phone: (402) 472-6073. Fax (402) 472-6070. kim@ktresearch.net.

Although research shows a positive association between depression and substance use among homeless youth (Hadland et al., 2011), studies are generally cross-sectional and retrospective; thus, researchers are unable to disentangle the time ordering of these events. Furthermore, it is unknown whether a specific depressive episode earlier in the day is linked to drinking and drug use later that day and whether this varies by gender and sexual orientation. The current study addresses this literature gap by using ecological momentary assessment (EMA) via short message service (SMS) surveying over a 30-day period with homeless youth to examine whether being depressed earlier in the day is associated with youths drinking alcohol, using marijuana, and using substances with their friends later that day. EMA allows the researcher to capture data on a specific behavior or feeling when it occurs in their natural environment (Shiffman, Stone, & Hufford, 2008). EMA via SMS surveys verifies the timing of one behavior relative to another, allowing for temporal sequencing (Cohn, Hunter-Reel, Hagman, & Mitchell, 2011) and minimizes recall biases (Kuntsche & Labhart, 2013). Given the high mobility of homeless youth (Tyler & Whitbeck, 2004), using SMS to collect daily data from this group is innovative and an improvement over prior retrospective studies of homeless youth. Moreover, understanding whether being depressed earlier in the day is linked with specific drinking and drug use episodes later that day and whether this varies by gender and sexual orientation has important implications for agencies serving this population such as being able to more effectively intervene to lower the risk for substance use.

Literature Review

Rates of substance use.

It is estimated that youth experiencing homelessness use substances 2–3 times more compared to their stably housed peers (Kipke, Montgomery, & MacKenzie, 1993; Thompson, 2004). Moreover, 75% of youth experiencing homelessness report lifetime alcohol and/or marijuana use (Bousman et al., 2005; Walls & Bell, 2011) whereas past 30-day prevalence rates for alcohol and marijuana usage have been found to be 68% and 66%, respectively (Wenzel, Tucker, Golinelli, Green, & Zhou, 2010). Santa Maria et al. (2018) found that 40 out of a total of 66 youth experiencing homelessness reported using drugs on at least one day in the prior 21 days and of these 40, 36 youths used marijuana, on average, a total of 5 days. Marijuana was the drug reported by youth as being used most often (Santa Maria et al., 2018). Lim, Rice, and Rhoades (2016) found that homeless youth used, on average, 2.45 different substances in the past 30 days with marijuana being used most frequently (73%) followed by alcohol (69%).

Depression.

Homeless youth have been found to have high rates of depression (Brown et al., 2015; Hadland et al., 2011; Nyamathi et al., 2012). Brown et al. (2015), for example, found that more than one-third of their sample of over 200 homeless youth met diagnostic criteria for major depression. Additionally, in a study of homeless youth attending school, 47% of these youth reported feeling depressed in the past 12 months with males being significantly less likely to feel depressed compared to females (Moore, Benbenishty, Astor, & Rice, 2018). Other research also finds that depression tends to be consistent over time (Tyler, Schmitz, &

Ray, 2018). The social circumstance of experiencing homelessness also increases risk for depression (Brown et al., 2015; Lim et al., 2016). Moreover, young people combating homelessness experience numerous psychological stressors such as depression that may place them at risk for substance misuse (Hadland et al., 2011; Lim et al., 2016; Nyamathi et al., 2012).

Substance using friends.

The friends of homeless youth have been found to be influential in their substance use such that having more peers who use substances is positively associated with youths' own substance use (Rice, Milburn, Rotheram-Borus, Mallett, & Rosenthal, 2005; Tyler, 2008a; Wenzel et al., 2010). Moreover, Rice and colleagues (2005) found that having a greater density of drug using peers within a social network increased the likelihood that homeless youth themselves would use drugs. Similarly, Wenzel et al. (2010) found that youth who had a greater number of substance-using peers in their networks were more likely to drink alcohol and use marijuana more frequently. Other studies also support the positive link between the influence of peers with homeless youths' alcohol and other drug misuse (Tompsett, Domoff, & Toro, 2013).

Gender, sexual orientation, and age.

There is a paucity of research that has examined whether gender, sexual orientation, and/or age are associated with poorer health outcomes (Bao, Whitbeck, & Hoyt, 2000; Cochran, Stewart, Ginzler, & Cauce, 2002; Tyler, 2008a). Gender and sexual orientation can be sources of status strains that may be important for understanding risk factors for poor mental health and/or substance use (Tyler, 2008a; Tyler et al., 2018). Status strain occurs when majority and minority groups have differential access to power, prestige, and resources that improve or exacerbate the risk for detrimental health outcomes (Pearlin, 1999). Among homeless youth, sexual minorities experience unique stressors, such as having higher levels of depressive symptoms (Tyler, 2008b) compared to heterosexual homeless youth. Similarly, homeless female youth generally fair worse on mental health outcomes (Stewart et al., 2004), such as experiencing greater symptoms of depression, compared to their male counterparts (Bao et al., 2000). As such, we would expect the relationship between depression and substance use to vary by these characteristics.

Similarly, there is a lack of research on substance use by gender, age, and sexual orientation and the studies that do exist tend to have mixed results. That is, some studies find no differences in marijuana use (Wenzel et al., 2010) or other drug related behaviors (Tyler, 2008a) by sexual orientation whereas one study found that heterosexual youth used more alcohol and drugs compared to lesbian, gay, and bisexual (LGB) youth (Santa Maria et al., 2018). In terms of gender, while one study found no differences in usage rates for alcohol or marijuana (Wenzel et al., 2010), other research has found that males have higher rates of drug and alcohol use compared to females (Santa Maria et al., 2018; Tyler, 2008a). While even fewer studies have examined age differences, one study found a positive link between older age and engaging in more drug related behaviors (Tyler, 2008a), while a second study found higher alcohol use among older-aged respondents but found no age difference by drug use (Santa Maria et al., 2018). Given the lack of research and inconsistent findings, more

research is needed to better understand whether the link between feeling depressed and substance use varies by gender and sexual orientation.

Current Study

Although prior research shows a positive link between depression and substance use among homeless youth (Hadland et al., 2011), studies are often cross-sectional and retrospective; thus, researchers are unable to disentangle the time ordering of these events. Moreover, it is unknown whether a specific depressive episode earlier in the day is linked to drinking and drug use later that day and whether this varies by gender and sexual orientation. To address these literature gaps, the current study uses EMA via SMS over 30 days with homeless youth to examine whether being depressed earlier in the day is associated with youths drinking alcohol, using marijuana, and using substances with their friends later that day.

METHOD

Data are from the Homeless Youth Texting Project, a pilot study designed to examine risk and protective factors for substance use and to field test EMA via SMS to ascertain its utility and feasibility with homeless youth. Findings from the feasibility study are reported elsewhere. From August 2014 through October 2015, 150 homeless youth were interviewed in two Midwestern cities. Of the 150 respondents interviewed at baseline, 112 youth or 75% completed a follow-up interview. The university Institutional Review Board approved this study.

Eligibility required youth to be between 16 and 22 years of age and homeless or runaway. *Homeless* youth, as inclusively defined by the 2015 reauthorization of the McKinney-Vento Homeless Assistance Act, includes those who lack *permanent* housing such as spending the previous night in a shelter, public place, on the street, with friends, or in a transitional facility, or other places not intended as a domicile (National Center for Homeless Education and the National Association for the Education of Homeless Children and Youth, 2017). All participants in the current study were unaccompanied youth, meaning they were not experiencing homelessness with family members or caregivers. *Runaway* includes those under age 18 who spent the previous night away from home without parental permission (Ennett, Bailey, & Federman, 1999). Participants were recruited through three local agencies which offer emergency shelter, food programs, transitional living services, and street outreach.

Four trained and experienced interviewers conducted the interviews. Interviewers approached youth at shelters, food programs, and during street outreach. Informed consent was obtained from youth, who were told that the study had three parts and if they agreed to participate, they would need to complete a baseline structured interview, the SMS portion, and a follow-up, structured interview. The two interviews, which were conducted in shelter interview rooms, local library, or outside (weather permitting) lasted 45 minutes and 15 minutes, respectively. Participants received a $20 and $10 gift card to a local store for completing the baseline and follow-up interview, respectively. Less than 3% of youth (N = 5) refused to participate or were ineligible.

Cell phone distribution.—Upon completing the baseline interview, participants were given a disposable cell phone and told they would receive 11 texts per day over the next 28–30 days and then would be re-contacted in approximately 30 days for a follow-up interview. The blocks of texts came at 10:00 am, 4:00 pm and 9:30 pm. Text questions were sent from an automated system, set up to send out text questions in the same order and at the same time each day. Responding to each text question required participants to enter a number(s). Typically, 3–4 days prior to the end of their texting period, youth were sent a text informing them how many texting days were left and to set up a follow-up interview. Those who responded to every text question (11 texts per day) were paid $50 cash (prorated at $0.14 per response) and those who responded to at least 85% of texts also received a bonus $10 gift card.

Measures

Text questions.—From the text data, we use one question asked at 4:00 pm: "Today I felt depressed or lonely." Approximately 15% of youth-days with valid substance use data were missing a report on the depression question. Thus, the depression measure has three categories (0 = not depressed, 1 = depressed, 2 = missing depression text). Next, we use three questions that were asked at 9:30 pm for our dependent variables: (1) alcohol use: "how many drinks tonight" (1 = any drinks, 0 = no drinks); (2) marijuana use: "used any of these drugs tonight" (weed, crank, meth, coke, inhalant, heroin, ecstasy, other, none). From this list of drugs, we examine only marijuana (i.e. weed) for the current analyses (1 = used marijuana; 0 = did not use marijuana); and (3) substance use with peers: "drank or did drugs with friends tonight" (1 = yes, 0 = no). On eight days, youth indicated that they drank with friends, but failed to answer the question about the number of drinks tonight. These answers were imputed to a "1 = any drinks" in the alcohol use question for that day.

Survey questions.—From the survey data, we include the following variables: *gender,* which was coded 0 = male; 1 = female; *sexual orientation,* which was coded 0 = LGB; 1 = straight or heterosexual; and *age,* which was a continuous variable that asked youth their current age at the time of the interview.

Statistical Analysis

Each day of texting (*i*) is nested within each youth (*j*); thus, the data have a multilevel format. For three sets of models we predict $logit(\Pr(y_{ij} = 1))$, where $y_{ij} = 1$ when there was any (1) drinking, (2) marijuana use, or (3) substance use with friends reported on a given day using the melogit procedure in Stata 15.1. The sample size for each set of models varies due to missing data. Overall, 143 youth reported information about drinking on 2,061 youth-days, indicating that they drank on 7.81% of those days. For marijuana use, 139 youth reported information on 2,224 youth-days, and youth used marijuana on 15.38% of those youth-days. Finally, 138 youth reported information about their substance use with friends on 1,928 days, indicating that they used some form of substance with their friends 15.46% of those youth-days.

RESULTS

Sample characteristics

Demographics based on wave 1 survey data included 150 homeless youth ages 16 to 22 years ($M = 19.4$ years). One-half (51%) were female, and 22% identified as LGB. In terms of substance use, 81% of youth reported lifetime marijuana use, 80% alcohol use, 23% ecstasy/designer drug use, 19% cocaine use, and 18% reported lifetime methamphetamine use. In terms of depression, using the DSM cut-off of 10, 69% of study youth have clinically significant depressive symptoms. For the SMS data, youth reported being depressed on 22% of youth-days.

Multivariate Models

Current day drinking.: Table 1 shows the results of multilevel binary logistic models for *current day drinking*. The first model included all covariates without interactions. Model 2 included an interaction between current day depression and gender (female), and Model 3 included an interaction between current day depression and sexual orientation (hetero). In Model 1, both female and heterosexual youth were less likely to report drinking by 65% and 75%, respectively, compared to their male and LGB counterparts.

Model 2 shows a significant interaction between gender and current day depression. As displayed in Figure 1, among youth who were not depressed, males had a significantly greater probability of drinking that day compared to females. Among youth that were depressed that day, however, there were no significant differences in current day drinking by gender. There were also no differences in reported drinking for youth who failed to answer the depression prompt.

Model 3 (Table 1) shows a significant interaction between sexual orientation and current day depression. Among youth who were not depressed that day, there were no differences in the probability of drinking by sexual orientation. However, as shown in Figure 2, among youth who were depressed that day, LGB individuals were significantly more likely to drink alcohol that evening compared to their heterosexual counterparts, as were youth who failed to answer the depression question.

Current day marijuana use.: Table 2 shows the results of multilevel binary logistic models for current day marijuana use, where Model 1 included all covariates without interactions, and Models 2 and 3 included interactions between current day depression with gender and sexual orientation, respectively. Those that were depressed on that day had increased odds of using marijuana by a factor of 1.601, while those that were heterosexual, compared to their LGB counterparts, were 80% less likely to have reported using marijuana. There were no significant interactions between current day depression with gender or sexual orientation for current day marijuana use.

Substance use with friends.: Table 3 shows multilevel binary logistic regression models for current day substance use with friends, where Model 1 included all covariates without interactions, and Models 2 and 3 included interactions between current day depression with gender and sexual orientation, respectively. As shown in Model 1, females and heterosexual

youth were 82% and 75% less likely to have reported using substances with their friends on the current day compared to their male and LGB counterparts, respectively. Models 2 and 3 revealed that there were no significant interactions between current day depression and gender or sexual orientation for current day substance use with friends, with one exception – LGB youth who failed to answer the depression question were more likely to use substances with friends than heterosexual youth who failed to answer this question (results not shown).

DISCUSSION

This study examined whether being depressed earlier in the day is associated with drinking alcohol, using marijuana, and using substances with friends later that day and whether this varies by gender and sexual orientation using EMA via SMS with homeless youth. Overall, we find that youth who report being depressed earlier in the day are more likely to report drinking alcohol later that day. Though females who are not depressed are less likely to drink alcohol than males, this gender difference disappears when both groups report being depressed. Moreover, though there is no difference in the probability of drinking by youth's sexual orientation when not depressed, we find that LGB youth are more likely to drink alcohol when they are depressed compared to their heterosexual counterparts. LGB youth are also more likely to use marijuana whereas males and LGB youth are more likely to report using substances with their friends compared to their counterparts.

Regarding overall substance use, the current findings are consistent with the work of Santa Maria et al. (2018) who found that homeless youth report using marijuana most often in their study using EMA methodology. Our findings also are consistent with previous research, which finds a positive link between depression and substance use (Hadland et al., 2011; Lim et al., 2016). However, our study goes beyond prior retrospective studies and adds to this body of research by showing that the association between depression and drinking is time ordered. That is, youth who report feeling depressed earlier in the day are more likely to report drinking alcohol later that day compared to youth who do not report feeling depressed. We find no gender differences for marijuana use, which is consistent with the work of Wenzel et al. (2010). It is possible that using marijuana is a way that homeless youth cope with their current situation (Kidd & Carroll, 2007) regardless of gender as prior research shows that marijuana is the most frequently used drug reported by homeless youth (Santa Maria et al., 2018).

We also find that males are more likely to report using substances with their friends compared to females. Because males use more substances (Santa Maria et al., 2018; Tyler, 2008a) and because peers are influential such that having more peers who use substances is positively associated with youths' own substance use (Rice et al., 2005; Tyler, 2008a; Wenzel et al., 2010), it is likely that males have a greater density of drug using peers within their social network, which increases the likelihood that these males would use more drugs (Rice et al., 2005). LGB youth also report using substances with their friends more so than heterosexual youth. In addition to experiencing homelessness, it is possible that LGB youth also must contend with additional sources of stress such as discrimination, which may lead some LGB youth to turn to substance use to cope (Kidd & Carroll, 2007) as well as rely on their peers for support, who may also be engaged in more frequent drug use.

Though we find gender differences such that males are more likely to drink alcohol compared to females, which is consistent with prior research (Santa Maria et al., 2018; Tyler, 2008a), this difference disappears when females report feeling depressed. In other words, when youth are depressed, they are more likely to report using alcohol later that day regardless of gender. Regarding sexual orientation, prior research finds that sexual minority homeless youth have higher levels of depressive symptoms (Tyler, 2008b) compared to heterosexual homeless youth, which is consistent with the current findings. Moreover, we find that although the probability of drinking is similar by sexual orientation when youth are not depressed, there is a higher probability of drinking among LGB youth when they are depressed compared to heterosexual youth. It is possible that due to their stigmatized status, LGB homeless youth may face more stigma and discrimination and these strains can increase the risk for negative health outcomes (Pearlin, 1999) including depression.

Limitations, strengths, and future directions

In terms of limitations, although we have some information from youth across 2,768 youth-days, we are missing substance use and depression data on between 20 and 30% of the youth-days, depending on the measure. Youth could answer the depression questions, but then not answer the substance use questions, and vice versa. These data appear to not be missing completely at random – failing to answer the depression question is differentially related to substance use with friends later that day for heterosexual and LGB youth. Second, the timing of the SMS question prompts captures the youth's experiences until that point but may have changed later that day. For example, the youth may have felt depressed or lonely after 4:00 pm or used substances after the 9:30 pm set of questions. Third, although youth were asked about a variety of different types of illicit drugs, only marijuana had sufficient levels of reports to examine individually among this group of youth. It is possible that a longer study period may have yielded more drug use.

Despite these limitations, our study has many strengths. To the best of our knowledge, this study is the first to use EMA via SMS with homeless youth to examine the link between depression, substance use, and using substances with friends based on daily data. Another strength is that we demonstrated that feeling depressed earlier in the day is a contributing factor to drinking alcohol later that day. Though we were unable to examine various other types of drugs given the insufficient levels of reports, future studies may wish to assess how feeling depressed is linked to illicit drug use. Additionally, given that youth who feel depressed are more likely to consume alcohol suggests the need for "just-in-time" interventions with this population.

Specifically, researchers have noted the dearth of information on effective interventions (Slesnick, Guo, & Brakenhoff, 2015), and have recently called for real-time risk assessments for substance use to inform the design of just-in-time interventions delivered via smartphones (Santa Maria et al., 2018). Our findings also reveal that youths' likelihood of drinking not only varies by gender and sexual orientation but also depends on whether youth are feeling depressed earlier in the day. Future studies may wish to replicate our findings to see if similar associations for gender and sexual orientation are found with other samples of homeless youth.

Our findings also have implications for service providers. If youth are using substances to cope with feeling depressed (Kidd & Carroll, 2007), intervention programs that teach alternative coping strategies, such as counseling and developing problem-solving skills, may result in lowering their risk for alcohol and drug use. Because these youth often feel depressed and lonely, having supportive ties, positive role models, and other social supports can bolster youths' mental health (Tyler & Schmitz, 2017). Additionally, if youth can stay connected to home-based social relationships, they have a greater chance of reintegrating into society, as opposed to becoming embedded in risky street networks (Auerswald & Eyre, 2002).

Overall, our study is an improvement over prior research as it provides a more nuanced understanding of the relationship between depression and drinking alcohol, the time ordering of these events, as well as how this relationship varies by gender and sexual orientation. EMA via SMS is a useful technique with homeless youth as we were able to capture data about their daily lives "as it occurred" (Shiffman et al., 2008) even though this is a highly mobile population (Tyler & Whitbeck, 2004). Moreover, because EMA via SMS surveying verifies the timing of one behavior relative to another (Cohn et al., 2011), we could determine that feeling depressed occurred prior to youths' substance use. Furthermore, because this technique minimizes recall biases (Kuntsche & Labhart, 2013), we could gather data on how youth were feeling each day, which allows for more specificity and allows us to control the timing of depression with alcohol and marijuana use.

Acknowledgments

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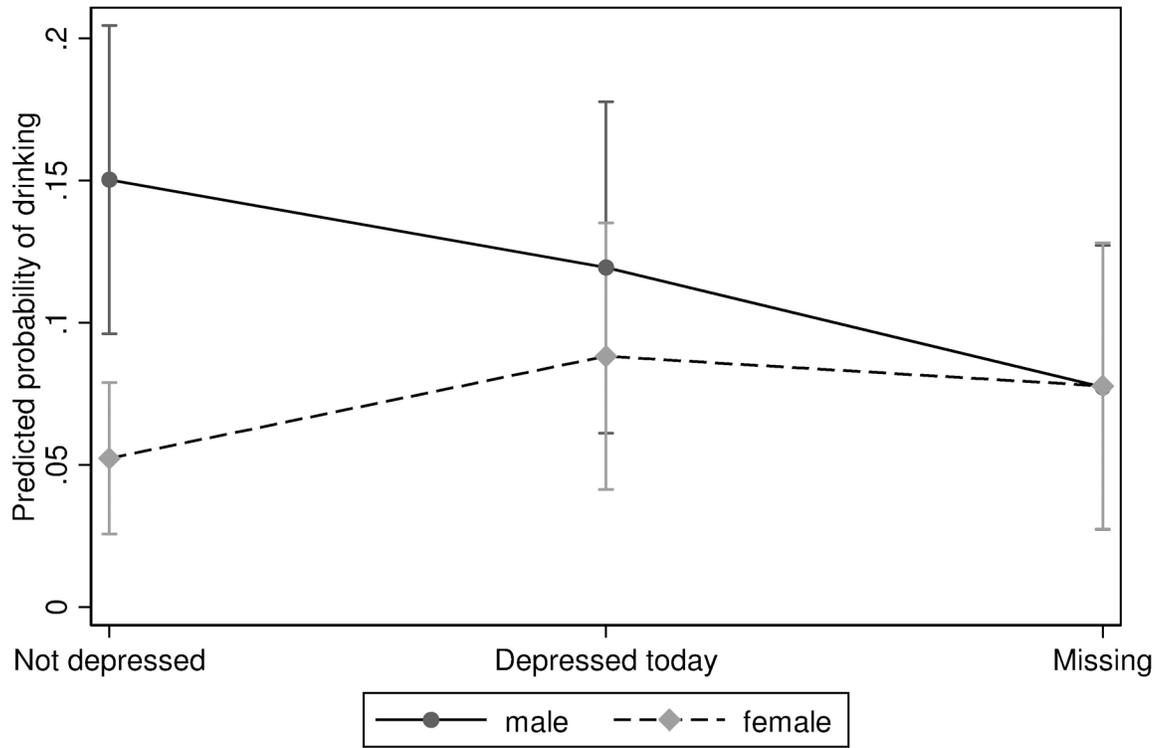
Figure 1:
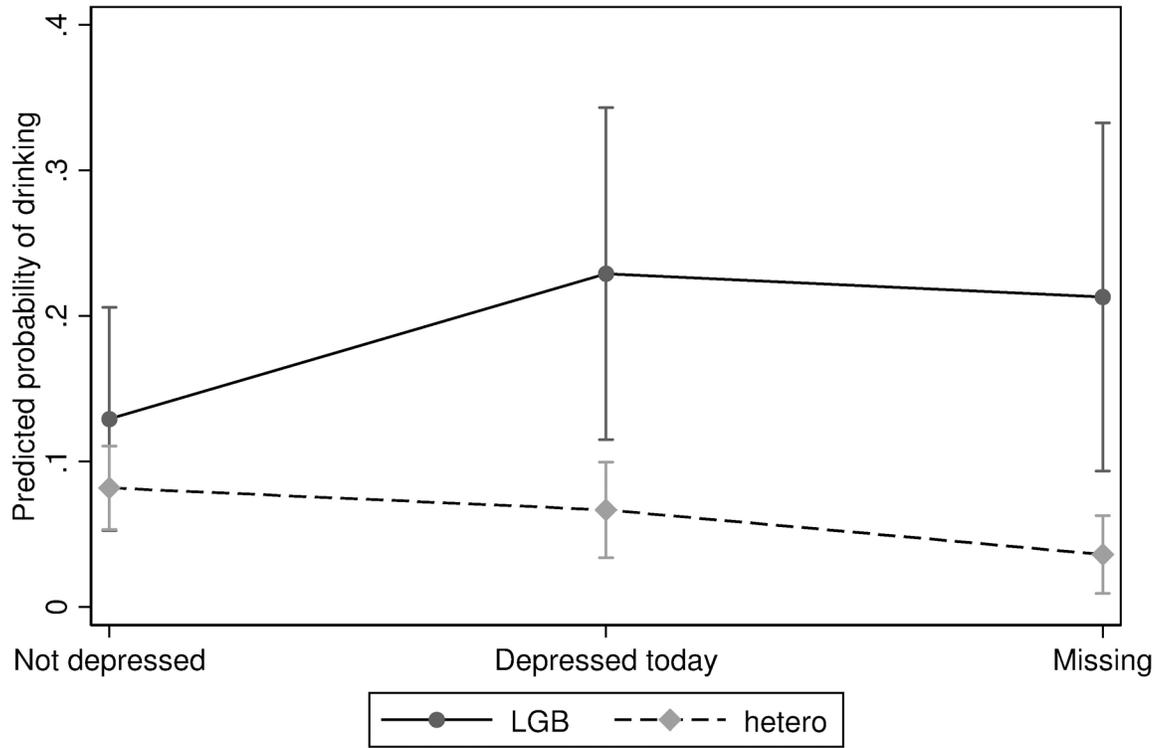Interaction effect between depression and gender on drinking

Figure 2:
Interaction between depression and sexuality on drinking

Table 1.

Adjusted Odds Ratio (AOR) and Confidence Intervals (CI) Predicting Current Day Drinking

	Model 1		Model 2		Model 3	
	AOR	CI	AOR	CI	AOR	CI
Depression	1.076	[.663–1.747]	0.692	[.360–1.328]	2.638	[1.078–6.457]
Depression missing	0.684	[.373–1.252]	0.363	[.157–.840]	2.309	[.860–6.200]
Female	0.347	[.155–.778]	0.213	[.088–.516]	0.353	[.160–0.779]
Age	1.121	[.874–1.439]	1.117	[.869–1.435]	1.132	[.885–1.448]
Heterosexual	0.253	[.102–.633]	0.258	[.103–.648]	0.513	[.185–1.422]
Depression × Female			2.975	[1.098–8.061]		
Missing Depression × Female			4.729	[1.392–16.067]		
Depression × Hetero					0.287	[.097–.843]
Missing Depression × Hetero					0.149	[.040–.551]
Intercept	0.020	[.000–3.245]	0.023	[.000–5.036]	0.010	[.000–1.499]
Random effects		p		p		p
Respondent variance	2.855		2.884		2.699	
Likelihood ratio test	127.22	<.0001	127.47	<.0001	123.24	<.0001
ICC	0.465		0.467		0.451	
Model Fit Statistics						
AIC	977.735		973.151		971.155	
Log-likelihood	−481.868		−477.576		−476.577	
Wald Chi-Square	14.82	.0112	22.39	.0022	24.56	0.0009
n	2061		2061		2061	
# Rs	143		143		143	

Table 2.

Adjusted Odds Ratio (AOR) and Confidence Intervals (CI) Predicting Current Day Marijuana Use

	Model 1		Model 2		Model 3	
	AOR	CI	AOR	CI	AOR	CI
Depression	1.601	[1.006–2.548]	1.490	[.796–2.790]	1.593	[.730–3.477]
Depression missing	1.246	[.766–2.027]	1.557	[.812–2.986]	1.195	[.510–2.798]
Female	0.350	[.115–1.064]	0.374	[.116–1.201]	0.350	[.115–1.063]
Age	1.390	[.980–1.971]	1.393	[.981–1.978]	1.390	[.980–1.972]
Heterosexual	0.201	[.053–.764]	0.204	[.054–.777]	0.198	[.049–.800]
Depression × Female			1.152	[.450–2.950]		
Depression missing × Female			0.612	[0.228–1.646]		
Depression × Hetero					1.002	[.378–2.658]
Depression missing × Hetero					1.066	[0.377–3.012]
Intercept	0.000	[.000–.197]	0.000	[.000–.185]	0.000	[.000–.201]
Random effects						
Respondent variance	11.231		11.336		11.242	
Likelihood ratio test	668.58	<.0001	669.24	<.0001	661.61	<.0001
ICC	0.773		0.775		0.774	
Model Fit Statistics						
AIC	1196.150		1198.834		1200.135	
Log-likelihood	−591.075		−590.417		−591.068	
Wald Chi-Square	15.34	0.0090	16.50	0.0209	15.35	0.0318
n	2224		2224		2224	
# Rs	139		139		139	

Table 3.

Adjusted Odds Ratio (AOR) and Confidence Intervals (CI) Predicting Current Day Substance Use with Friends

	Model 1		Model 2		Model 3	
	AOR	CI	AOR	CI	AOR	CI
Depression	1.364	[.855–2.175]	1.009	[.542–1.879]	2.168	[0.943–4.987]
Depression missing	1.331	[.784–2.257]	1.043	[.538–2.021]	3.882	[1.472–10.234]
Female	0.181	[.061–.535]	0.132	[.042–.417]	0.183	[.062–.540]
Age	1.282	[.925–1.779]	1.275	[.917–1.771]	1.288	[.930–1.785]
Heterosexual	0.245	[.068–.879]	0.245	[.068–.887]	0.397	[.103–1.535]
Depression × Female			2.098	[.806–5.464]		
Depression missing × Female			1.992	[.663–5.988]		
Depression × Hetero					0.530	[.193–1.457]
Depression missing × Hetero					0.216	[0.067–0.693]
Intercept	0.002	[.000–1.397]	0.002	[.000–1.805]	0.001	[.000–0.894]
Random effects						
Respondent variance	8.830		8.989		8.677	
Likelihood ratio test	487.30	<.0001	489.19	<.0001	482.82	<.0001
ICC	0.729		0.732		0.725	
Model Fit Statistics						
AIC	1109.696		1110.724		1106.813	
Log-likelihood	–547.848		–546.362		–544.407	
Wald Chi-Square	16.61	0.0053	18.90	0.0085	23.41	0.0014
n	1928		1928		1928	
# Rs	138		138		138	