Research paper

Parent problem drinking trajectory classes predict anxiety in adolescence and emerging adulthood

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ABSTRACT

Background: This study identified latent trajectory classes for maternal problem drinking and paternal problem drinking and examined the associations between these trajectory classes and offspring anxiety symptoms during adolescence and emerging adulthood.

Methods: Participants (n = 870; 54% female; 59% non-Hispanic White; Mage = 16.10, SD = 0.71) were administered surveys during the spring of 2007, 2008, and 2009, and 2014.

Results: Fit indices from parallel process growth mixture models suggested three dual trajectory classes: (1) Low initial levels of maternal problem drinking and paternal problem drinking that increased over time (Low-Both); (2) Low initial levels of maternal problem drinking that increased over time and high initial levels of paternal problem drinking that increased slightly over time (Low-Mom/High-Dad); (3) High initial levels of maternal problem drinking that increased slightly over time and low initial levels of paternal problem drinking that remained relatively stable over time (High-Mom/Low-Dad). Girls were more likely than boys to be classified in the Low-Mom/High-Dad and High-Mom/Low-Dad classes, relative to the Low-Both trajectory class. In addition, adolescents in the High-Mom/Low-Dad trajectory class reported the most anxiety symptoms during adolescence and emerging adulthood.

Limitations: Limitations include the reliance on one informant (the adolescent/emerging adult) and the geographically limited sample (northeastern United States).

Conclusions: Prevention and intervention programs aimed at reducing anxiety should consider changes in alcohol use in both the father and the mother over time. Moreover, special attention should be paid to maternal problem drinking given that it appears to be a salient risk factor for anxiety during adolescence and emerging adulthood.

1. Introduction

Parental alcoholism is a widespread problem in the United States (U.S.). Nearly 15% of children in the U.S. live with at least one adult diagnosed with current alcohol abuse or alcohol dependence, and approximately 30% have been exposed to an alcoholic parent (Grant, 2000; SAMHSA, 2012). These 7.5 million children of alcoholics (COAs) are at an increased risk for a multitude of problems, including impaired cognitive and socio-emotional development (Berg et al., 2017; SAMHSA, 2012). During adolescence and emerging adulthood, COAs have an elevated risk for substance use and related problems (Finan et al., 2018; King and Chassin, 2007, 2008; Park and Schepp, 2015; Rossov et al., 2016; Sternberg et al., 2018). COAs are more likely to use and/or misuse alcohol and drugs (Chassin et al., 2002; Sternberg et al., 2018), experiment with alcohol and drugs at a younger age (King and Chassin, 2007; Ohannessian and Hesselbrock, 2008), experience a more rapid acceleration of substance use (King et al., 2006; Trim et al., 2007), and meet the criteria for alcohol or drug dependence (Bountress et al., 2017) in comparison to non-COAs. COAs are especially vulnerable to the development of these problems as they transition into emerging adulthood, a peak period for alcohol and drug problems (Niño et al., 2017; Ohannessian, 2009; Trim et al., 2007).

The earlier and more extensive use of alcohol and drugs by COAs (Ohannessian, 2009; Trim et al., 2007; Walden et al., 2007), in turn, places them at a greater risk for internalizing problems (Hussong et al., 2008; Ohannessian, 2009, 2013; Park and Schepp, 2015; Trim et al., 2007; Skogen et al., 2016) as well. Of note, most studies that have examined COAs’s risk for internalizing problems have focused on

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depression; relatively few studies have examined anxiety, which is unfortunate given that research has indicated that anxiety is as common as depression (Kessler et al., 2012; Merikangas et al., 2010). Anxiety disorders during adolescence and emerging adulthood are relatively common, with ~30% of youth meeting the criteria for at least one anxiety disorder (Maldonado et al., 2013; Merikangas et al., 2010). Research has shown that anxiety disorders increase through adolescence and peak during emerging adulthood (Whiteford et al., 2013). It should be noted that experiencing even mild to moderate levels of anxiety has been shown to negatively affect youth adjustment (Ohannessian et al., 1999). Indeed, subclinical anxiety is a salient predictor of subsequent anxiety disorders (Copeland et al., 2009; Ferdinand et al., 2007) and has been linked to poor academic performance, psychiatric comorbidity, and increased health service utilization (Burstein et al., 2012; Kendall et al., 2010; Langley et al., 2014; Merikangas et al., 2010). Importantly, youth with a problem drinking parent have been shown to report higher levels of anxiety than youth without a problem drinking parent (Ohannessian, 2009).

1.1. Parent gender

Although research has demonstrated a link between parental problem drinking and youth psychosocial adjustment (Ohannessian, 2012; Trim et al., 2007), most studies have focused on paternal problem drinking (Leonard and Eiden, 2007). Maternal problem drinking has been relatively neglected. Examining paternal drinking in isolation of maternal behavior, including maternal drinking, is not in line with contemporary family theories such as family systems theory (Bowen, 1974; Minuchin, 2002). According to family systems theory, all family members are influenced by, and influence one another (Cox and Paley, 2003). Given the interdependent nature of family relationships proposed by family systems theory (Broderick, 1993), the examination of alcohol use by only one parent yields an incomplete picture of the effects of parental problem drinking on COA adjustment. Indeed, recent research has indicated that the number of parents with a history of an alcohol use disorder (AUD) is positively and directly related to the young person’s risk for developing an AUD (Kosty et al., 2020). Moreover, the few studies that have included maternal drinking have found maternal drinking to significantly influence adolescents and emerging adults. For example, Alati and colleagues (Alati et al., 2014) found that during early adolescence, maternal alcohol use, but not paternal alcohol use, was associated with adolescent alcohol use. In another study conducted by Alati and colleagues (Alati et al., 2005), maternal alcohol use (even moderate use) during adolescence was the most salient predictor of alcohol use disorders during emerging adulthood. Similarly, Mahedy et al. (2018) found maternal alcohol use to be positively associated with young adult alcohol use. Research also suggests that differential effects of maternal and paternal problem drinking on other indicators of adjustment (e.g., internalizing problems) need to be considered as well (Finan et al., 2015; Ohannessian, 2012). It is important to consider the drinking of one parent within the context of the other parent. For example, in a study by Finan and colleagues (Finan et al., 2018), the relationship between paternal problem drinking and adolescent drug use only was significant for those who reported high maternal problem drinking and low maternal support. In another study examining adolescents (Ohannessian, 2015), significant interactions were found between paternal problem drinking and maternal problem drinking for internalizing problems. These interactions suggested that when paternal problem drinking was high, depression symptomatology and anxiety symptomatology were lower if maternal problem drinking was low. These studies underscore the importance of examining maternal problem drinking and paternal problem drinking concurrently, an issue that most studies have overlooked.

1.2. Trajectories of parent problem drinking

An additional limitation of the literature is that most studies have considered parental alcoholism to be a static variable. Parental alcoholism typically is assessed at one point in time, overlooking change that may occur in parental drinking over time. Moreover, most research has treated parental drinking as a categorical variable. Continuous assessments are needed to capture the wide range of variability and to provide a more comprehensive representation of the entire range of problem drinking (Cummings and Davies, 1994). Of note, assessing alcohol use continuously is in line with research (e.g., Helzer et al., 2006; Keller et al., 2008; Krueger et al., 2004) that has indicated that the severity of parental drinking should be considered when examining youth psychosocial adjustment.

Given the limitations of the extant literature, the present study examined trajectories of maternal problem drinking (assessed continuously) and paternal problem drinking (also assessed continuously) in tandem and in relation to anxiety symptoms in a diverse sample of youth transitioning from adolescence to emerging adulthood. Few studies have considered both maternal problem drinking and paternal problem drinking, and no study has examined trajectories of maternal problem drinking and paternal problem drinking simultaneously. As such, the goal of this study was to identify latent trajectory classes for maternal problem drinking and paternal problem drinking, in tandem, and to examine the associations between these trajectory classes with adolescent and emerging adult anxiety symptoms. Given that some research has found the relationship between parental problem drinking and psychosocial adjustment to differ by gender (Finan et al., 2015; Ohannessian, 2012), and that females are at a greater risk for experiencing anxiety disorders (Kessler et al., 2012; Merikangas et al., 2010) and higher levels of anxiety symptomatology (McLaughlin and King, 2015; Ohannessian et al., 2017; Ohannessian, 2018; Simpson et al., 2020) in comparison to males during adolescence and emerging adulthood, gender differences also were examined.

2. Methods

2.1. Participants

All participants were involved in a larger, longitudinal research project examining parental problem drinking and adolescent psychological adjustment (Ohannessian, 2012; https://adolescentadjustmentproject.com). During the spring of 2007 (Time 1), 10th and 11th grade students from seven public high schools in the Mid-Atlantic region of the United States (Delaware, Maryland, and Pennsylvania) were invited to participate in the study. Participants were followed up in the spring of 2008 (Time 2), the spring of 2009 (Time 3), and five years later in 2014 (Time 4).

At Time 1 (n = 870), the mean age of the adolescents was 16.10 (SD = 0.71). Relatively equal numbers of girls and boys participated (54% girls). The racial/ethnic breakdown was as follows: 59% non-Hispanic White, 22% Black/African American, 10% Hispanic/Latino, 3% Asian, and 6% other. These percentages are consistent with the demographics from the area from which the sample was drawn at the time of data collection (71% non-Hispanic White, 23% Black/African American, 7% Hispanic/Latino, 4% Asian; U.S. Census Bureau, 2008). Most of the adolescents (77%) lived with two or more caregivers. In addition, the majority of the parents (96% of mothers and 97% of fathers) had graduated from high school. Some of the parents (27% of mothers and 25% of fathers) had completed four years of college as well. A minority of the parents (11% of mothers and 8% of fathers) also had attended graduate or medical school. Although parental problem drinking was measured as a continuous variable in this study, it should be noted that 6% of mothers and 12% of fathers met the criteria for alcohol abuse.
2.2. Measures

Adolescents completed a demographic questionnaire that consisted of questions about their age, race, and parents’ highest education level completed (1 = elementary school to 6 = graduate or medical school). Additional measures administered are discussed below.

2.2.1. Parental problem drinking

A revised version of the Short Michigan Alcoholism Screening Test (M-SMAST - mother version / F-SMAST - father version; Crews and Sher, 1992) was used to measure parental alcohol problems at Times 1, 2, and 3. This measure includes nine items that assess children’s perceptions of their parents’ alcohol use. Adolescents who responded in regard to a non-biological mother or a non-biological father were not included in this study. A sample item is “Has your mother/father ever neglected his/her obligations, family, or work for two or more days in a row because she/he was drinking?” The SMAST items were summed to reflect a total problem drinking score for mothers and fathers separately (range = 0-12). A SMAST total score of 5 or higher may indicate a clinical alcohol problem (abuse and/or dependence). The total scores were positively skewed and therefore transformed by applying logarithmic transformations. Both the M-SMAST and the F-SMAST have been found to have good agreement with the Family History - Diagnostic Criteria Interview (Crews and Sher, 1992). Of note, adolescents’ and their parents’ perceptions of parental alcohol abuse have been shown to be highly correlated (r = 0.70, p < .001; Crews and Sher, 1992). Cronbach’s alpha coefficients for the M-SMAST and the F-SMAST in our sample ranged from 0.81 to 0.86 for mothers and 0.86 to 0.87 for fathers over time.

2.2.2. Anxiety

The Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1995) was used to assess anxiety at Time 1 and Time 3. When completing the SCARED, respondents are asked to answer items in regard to how much they felt during the past three months. Representative items are “I get really frightened for no reason at all” and “I am nervous.” The SCARED response scale ranges from 0 = not true or hardly ever true to 2 = very true or often true. The 41 SCARED items were summed to create a total anxiety score (range = 0–82). Prior studies have demonstrated that the SCARED has good psychometric properties (Birmaher et al., 2003; Muris et al., 2002). The alpha coefficient for the SCARED total score in our sample ranged from 0.93 to 0.94.

The Beck Anxiety Inventory-Trait (BAI-T; Kohn et al., 2008) was used to assess anxiety at Time 4. Participants were asked to respond to 21 items in regard to how much “they were bothered (by anxiety symptoms) on a day-to-day basis.” Representative BAI-T items are “unable to relax” and “fear of worst happening.” The response scale ranges from 0 = rarely or never to 3 = almost always. The BAI-T has demonstrated good psychometric properties (Kohn et al., 2008). The alpha coefficient for the BAI total score in our sample was 0.89.

2.3. Procedures

Prior to data collection, parents were mailed a consent form that was informed that participation was voluntary, all data collected were confidential, and that they could withdraw from the study at any time. They also were told that an active Certificate of Confidentiality from the U.S. government was in place to further protect their privacy. Adolescents were given a movie pass once their survey was completed. All participants were invited to participate again in the spring of 2008 (Time 2) and the spring of 2009 (Time 3). The same protocol was used at these subsequent waves of data collection. The study protocol was approved by the University of Delaware’s Institutional Review Board. The retention rate was 80%.

All participants were invited to complete an online ~30 min follow-up Qualtrics survey five years later in 2014 (Time 4). Participants provided informed consent immediately before completing the online survey and were mailed a $15 gift card upon receipt of their survey. Procedures for Time 4 were approved by Connecticut Children’s Institutional Review Board.

2.4. Analytic plan

Unconditional parallel process growth mixture models (PP-GMMs) were estimated to identify latent subgroups distinguished during late adolescence by maternal and paternal problem drinking trajectories from Time 1 through Time 3. Per standard methodological practice, a series of PP-GMMs were estimated with increasingly lenient constraints imposed on the growth factor variances and covariances (Ohannessian and Vannucci, 2018; Olino et al., 2010; Wickrama et al., 2016). Time-specific residual correlations between maternal and paternal problem drinking scores also were included in the PP-GMMs to account for within-time associations that were not due to each of the parent problem drinking trajectories and to minimize covariance between the measures that may be due to the use of identical questionnaires for mothers and fathers.

All models were estimated with 500 random initial start values and 50 optimizations to avoid solutions that represented local rather than global maxima. Indicators of model fit that were considered when identifying the optimal PP-GMM included: the Bayesian information criterion (BIC; Schwarz, 1978); the consistent Akaike information criterion (cAIC, Bozdogan, 1987); and the Lo-Mendell-Rubin likelihood ratio-based test (LMR-LRT; Lo et al., 2001). Lower BIC and cAIC values suggested a better fitting model, whereas p values <.05 for the LMR-LRT indicated that a k-class model provided a superior fit than a k-1 class model. The entropy value also was examined as an indicator of model classification accuracy, with values >0.70 suggesting acceptable accuracy (Wickrama et al., 2016).

The three-step process for conditional PP-GMMs involving covariates and distal outcomes was employed to examine the associations of latent class membership in distinct parent problem drinking trajectory subgroups with baseline (Time 1) characteristics and with anxiety symptoms at Time 3 (during late adolescence) and at Time 4 (during emerging adulthood) (Asparouhov and Muthén, 2014). The three-step process was used to protect the formation of latent trajectory classes from the influence of predictor variables and to account for uncertainty in latent trajectory class membership in analyses (Asparouhov and Muthén, 2014). Parameters from the best-fitting unconditional PP-GMM were utilized in the conditional PP-GMMs. Multinomial logistic regression models were conducted to examine whether baseline covariates predicted membership in latent parent problem drinking trajectory subgroups with baseline (Time 1) characteristics and with anxiety symptoms at Time 3 (during late adolescence) and at Time 4 (during emerging adulthood) (Asparouhov and Muthén, 2014). Baseline covariates included age, gender, race/ethnicity, mean parental education, and the anxiety symptoms total score. Wald chi-square tests were conducted to examine whether membership in latent parent problem drinking trajectory subgroups predicted the distal outcomes of anxiety symptoms at Time 3 and Time 4 (Asparouhov and Muthén, 2014). Analyses were conducted with Mplus 8.0 (Muthén and Muthén, 1998–2017). Gender differences were assessed by examining whether the interaction between membership group and gender predicted anxiety symptoms at Time 3 and Time 4. Full information maximum likelihood estimation was employed to handle missing data (Enders, 2010).
3. Results

3.1. Descriptive statistics

Means, standard deviations, and correlations between all continuous study variables are shown in Table 1. As shown, maternal problem drinking and paternal problem drinking were positively associated with one another. In addition, maternal problem drinking and paternal problem drinking were consistently and positively associated with adolescent and emerging adult anxiety symptoms (see Table 1).

Of note, girls reported significantly higher levels of anxiety symptoms at Time 1, \( t(862) = -7.30, p < .001 \), and at Time 3, \( t(553) = -3.35, p < .001 \), relative to boys. Boys reported slightly higher levels of paternal problem drinking at Time 1 than girls, \( t(866) = -2.78, p < .01 \). There were no gender differences observed for any other primary study variables (\( ps > 0.05 \)).

3.2. Unconditional parallel process growth mixture models

3.2.1. Selection of a preferred trajectory class solution

Table 2 displays the fit indices derived from unconditional PP-GMMs with admissible solutions. Although the information-based fit indices did not converge around a preferred trajectory class solution, the LMR-LRT indicated that a three-class solution provided a significant superior model fit relative to a two-class solution for two PP-GMMs with varying constraints (\( ps < 0.05 \)). The candidate models that emerged with significant LMR-LRT values for the three-class solution were: 1) the model with all variance and covariance parameters estimated, but constrained to be equal across classes. Both models had excellent classification accuracy, with entropy values >0.99. However, the latter model had lower BIC and cAIC values upon comparison of the information-based fit indices for these two candidate solutions. As such, the three-class trajectory model with variances and covariances constrained to be equal across latent classes was considered the preferred model. The probability of correct class assignment for this three-class solution further suggested excellent classification accuracy, as the average posterior probabilities for most likely class membership of each class ranged between 0.99 and 1.00.

3.2.2. Descriptive statistics for the preferred solution

The descriptive statistics for each latent trajectory class are displayed in Table 3. As shown in Fig. 1, the largest parent drinking trajectory class was distinguished by low initial levels of both maternal problem drinking and paternal problem drinking that increased over time (Low-Both; \( n = 638, 73\% \)). The next largest parent drinking trajectory class was distinguished by low initial levels of maternal problem drinking that increased over time, and by high initial levels of paternal problem drinking that increased slightly over time (Low-Mom/High-Dad; \( n = 169, 20\% \)). Finally, the smallest parent drinking trajectory class was distinguished by high initial levels of maternal problem drinking that increased slightly over time, and by low initial levels of paternal problem drinking that remained relatively stable over time (High-Mom/Low-Dad \( n = 63, 7\% \)).

The variance in the paternal problem drinking intercept factor was statistically significant (\( p < .001 \)), suggesting the presence of inter-individual variability in the initial level of paternal problem drinking within each trajectory class. Other growth factor variances were not significant (\( ps > 0.05 \)), indicating a lack of inter-individual variability in the initial level of maternal problem drinking and in the rates of change for both maternal and paternal problem drinking within each trajectory class. No growth factor parameters were significantly correlated (\( ps > 0.05 \)). Finally, residual correlations examining within-time associations between maternal problem drinking and paternal problem drinking were significant at Time 2 (\( r = 0.24, SE = 0.07, p = .001 \)) and Time 3 (\( r = 0.16, SE = 0.07, p < .05 \)), but not at Time 1 (\( r = 0.01, SE = 0.11, p > 0.05 \)).

3.2.3. Gender differences

Girls had significantly increased odds than boys of being in the Low-Mom/High-Dad and High-Mom/Low-Dad trajectory classes relative to being in the Low-Both trajectory class (\( ps < 0.05 \)).

Table 1

<table>
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Note: Mother problem drinking and father problem drinking raw scores were logarithm-transformed to achieve a normal distribution.

*** \( p < .001 \)
** \( p < .01 \)
* \( p < .05 \)
3.3. Trajectory classes and anxiety symptoms

Adolescents reporting higher baseline anxiety symptoms had significantly increased odds of being in the Low-Mom/High-Dad and High-Mom/Low-Dad trajectory classes relative to being in the Low-Both trajectory class ($p < 0.01$). In addition, adolescents in the High-Mom/Low-Dad parent drinking trajectory class reported significantly higher anxiety symptoms at Time 3 than adolescents in the Low-Mom/High-Dad trajectory class, $\chi^2(2) = 5.42, p < .05$, and adolescents in the Low-Both trajectory class, $\chi^2(2) = 7.96, p < .01$ (see Fig. 2). Findings were comparable for anxiety symptoms during emerging adulthood. Specifically, adolescents in the High-Mom/Low-Dad parent drinking trajectory class reported significantly higher anxiety symptoms at Time 4 during emerging adulthood than those in the Low-Mom/High-Dad trajectory class, $\chi^2(2) = 5.10, p < .05$, and those in the Low-Both trajectory class, $\chi^2(2) = 4.67, p < .05$ (see Fig. 2). There were no significant differences between the Low-Mom/High-Dad and Low-Both trajectory classes for follow-up anxiety symptoms at either Time 3, $\chi^2(2) = 0.62, p > .05$, or at Time 4, $\chi^2(2) = 0.05, p > .05$. Significant interactions across classes.

### Table 2

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Notes: BIC = Bayesian Information Criterion; cAIC = Consistent Akaike Information Criterion; LL = Log-likelihood; LMR-LRT = Lo-Mendell-Rubin Likelihood Ratio Test; Lower BIC and cAIC values indicated better model fit. LMR-LRT $p$ values $< .05$ indicated that the $k$-class solution was a superior fit compared to a $k$-1 class solution. Entropy values $>0.70$ indicate an acceptable level of overall classification accuracy. PP-GMM-1 constrained all growth factor variance and covariance parameter estimates to be zero across trajectory classes. PP-GMM-2 freely estimated all growth factor variance and covariance parameters, but these parameters were constrained to be equal across classes. PP-GMM-3 freely estimated all growth factor variance and covariance parameters; however, growth factor variances were allowed to vary across classes, whereas growth factor covariance estimates were constrained to be equal across classes. PP-GMM-4 freely estimated all growth factor variance and covariance parameters; however, growth factor variance estimates were constrained to be equal across classes, whereas growth factor covariance estimates were allowed to vary across classes. PP-GMM-5 freely estimated all growth factor variance and covariance parameters and permitted each parameter to vary across classes.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

### Table 3

<table>
<thead>
<tr>
<th>Maternal Problem Drinking</th>
<th>Paternal Problem Drinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>Intercept</td>
</tr>
<tr>
<td>Slope</td>
<td>Slope</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td><strong>M</strong></td>
</tr>
<tr>
<td>Class 1 (n = 637; 73%)</td>
<td>Class 2 (n = 169; 20%)</td>
</tr>
<tr>
<td>Class 3 (n = 63; 7%)</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td></td>
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</table>

Correlations Among Growth Factor Parameters

<table>
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<th>Intercept</th>
<th>Slope</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td>Drinking</td>
<td>0.01</td>
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</table>

<table>
<thead>
<tr>
<th>Paternal Problem</th>
<th>Intercept</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Drinking</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

Note: Intercept and slope values were back-log-transformed to provide interpretable values on the scale of the MAST (cutoff score = 5.0).

* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.3. Conditional parallel process growth mixture models

3.3.1. Trajectory classes and anxiety symptoms

Adolescents reporting higher baseline anxiety symptoms had significantly increased odds of being in the Low-Mom/High-Dad and High-Mom/Low-Dad trajectory classes relative to being in the Low-Both trajectory class ($p < 0.01$). In addition, adolescents in the High-Mom/Low-Dad parent drinking trajectory class reported significantly higher anxiety symptoms at Time 3 than adolescents in the Low-Mom/High-Dad trajectory class, $\chi^2(2) = 5.42, p < .05$, and adolescents in the Low-Both trajectory class, $\chi^2(2) = 7.96, p < .01$ (see Fig. 2). Findings were comparable for anxiety symptoms during emerging adulthood. Specifically, adolescents in the High-Mom/Low-Dad parent drinking trajectory class reported significantly higher anxiety symptoms at Time 4 during emerging adulthood than those in the Low-Mom/High-Dad trajectory class, $\chi^2(2) = 5.10, p < .05$, and those in the Low-Both trajectory class, $\chi^2(2) = 4.67, p < .05$ (see Fig. 2). There were no significant differences between the Low-Mom/High-Dad and Low-Both trajectory classes for follow-up anxiety symptoms at either Time 3, $\chi^2(2) = 0.62, p > .05$, or at Time 4, $\chi^2(2) = 0.05, p > .05$. Significant interactions across classes.
Fig. 1. Parent drinking trajectories for the optimal three-class solution across adolescence
Note: dotted lines represent 95% confidence intervals.
between trajectory subgroup membership and gender were not observed.

4. Discussion

The majority of studies examining parental problem drinking have treated problem drinking as a static variable. Relatively few studies have considered change in parent drinking status. Moreover, most studies have focused on paternal problem drinking (Leonard and Eiden, 2007), neglecting the influence that maternal problem drinking may have on youth adjustment. Only a handful of studies have examined both paternal problem drinking and maternal problem drinking, and those that have typically have not examined them conjointly and/or have not examined change in parent drinking over time. Examining parental behavior in isolation is not consistent with family systems theory (Broderick, 1993), which emphasizes the interdependent nature of family relationships. Clearly, focusing on the behavior of only one parent yields an incomplete picture of the effects of parental problem drinking on youth adjustment. Given the dearth of research that has considered the effects of both paternal problem drinking and maternal problem drinking on youth adjustment, a primary goal of this study was to identify latent class trajectories for paternal drinking and maternal drinking simultaneously.

Results indicated that a three-class solution yielded the best fit to the data. This solution consisted of the following three groups: 1) low initial levels of both maternal problem drinking and paternal problem drinking that increased over time (Low-Both); 2) low initial levels of maternal problem drinking that increased over time, and high initial levels of paternal problem drinking that increased slightly over time (Low-Mom/High-Dad); and 3) high initial levels of maternal problem drinking that increased slightly over time, and low initial levels of paternal problem drinking that remained relatively stable over time (High-Mom/Low-Dad).

Of note, adolescent gender was associated with these trajectories. Specifically, adolescent girls had significantly increased odds (relative to adolescent boys) of being in the Low-Mom/High-Dad and the High-Mom/Low-Dad trajectory class. Given that the adolescents reported on their parents’ problem drinking, these findings may reflect girls being more attuned to the family and family problems in comparison to boys during adolescence. Research has shown that during adolescence, girls are more enmeshed in the family than are boys (Gore et al., 1993). In addition, adolescent girls are more sensitive to disruptions and conflict in their family in comparison to adolescent boys (Davies and Lindsay, 2004; Unger et al., 2000).

Another goal of this study was to examine the associations between parent problem drinking trajectories and adolescent and emerging adult anxiety symptoms. In line with prior studies (Hussong et al., 2008; Ohannessian, 2009, 2015; Park and Schepp, 2015), parent problem drinking trajectories were associated with anxiety. Specifically, results indicated that adolescents reporting higher baseline anxiety symptoms were more likely to be in the Low-Mom/High-Dad and High-Mom/Low-Dad trajectory classes relative to the Low-Both trajectory class. In addition, adolescents in the High-Mom/Low-Dad trajectory class reported significantly higher follow-up anxiety symptoms during late adolescence and emerging adulthood in comparison to those in the Low-Mom/High-Dad trajectory class and those in the Low-Both trajectory class.

These findings suggest that maternal problem drinking may be a more salient predictor, than paternal problem drinking, of anxiety during late adolescence and emerging adulthood. Notably, these findings are in keeping with prior research that has found maternal alcohol use to be a more consistent predictor, than paternal alcohol use, of adolescent and emerging adult alcohol use (Alati et al., 2005; Alati et al., 2014). It may be that maternal problem drinking is more closely linked to youth adjustment, relative to paternal problem drinking, because most youth tend to spend more time with, and communicate more with, their mother than with their father (Finley et al., 2008; Hawkins et al., 2006; Smelzer et al., 2006; Williams and Kelly, 2005). Indeed, many studies have shown that mothers are more likely than fathers to provide care and emotional support for their adolescent children (McGraw and Walker, 2004; Monna and Gauthier, 2008), a pattern that persists into emerging adulthood (Arnett and Schwab, 2013; Markiewicz et al., 2006). It also should be noted that problematic alcohol use has been shown to be more closely linked to anxiety disorders for women than for men (Reissler et al., 2005). As such, it makes sense that the offspring of female drinkers (the High-Mom/Low-Dad trajectory class) experienced more anxiety symptoms in comparison to the offspring of male drinkers because maternal drinking may serve as a proxy indicator of genetic/familial risk for anxiety.

Notably, findings from this study indicate that parent behaviors, including drinking behaviors, continue to influence young people as
they transition from adolescence into emerging adulthood. These findings are in line with prior research that has shown that young people continue to rely on their parents, especially their mother, during the transition into emerging adulthood (Markiewicz et al., 2006). Of note, the dependence on parents for support during the vulnerable transition from adolescence to emerging adulthood may be problematic if the parent(s) are misusing alcohol. Mothers with problematic drinking patterns also are more likely to face other challenges that limit their ability to support their children’s emotional and physical needs, including having fewer financial resources, unstable housing, legal problems, domestic violence, caregiver disruptions, comorbid mental and physical health problems, and a lack of support from family and friends (Conners et al., 2004). A problem drinking parent may not be able to provide adequate emotional and instrumental support, which may have lasting negative impacts on psychological adjustment, as our findings have indicated.

This study contributed to the extant literature by examining developmental trajectories of paternal problem drinking and maternal problem drinking simultaneously. Moreover, associations between these trajectories and anxiety symptomatology were examined over time throughout adolescence and emerging adulthood. Gender differences also were examined. Another notable strength was the use of a continuous measure to assess parental problem drinking. Nonetheless, limitations should be considered. Although the sample during the high school years (Time 1–3) was large (n = 870), the follow-up sample was smaller (n = 256) given the difficulties of collecting longitudinal data over long periods of time. Nonetheless, the follow-up sample still was a respectable size. However, it should be noted that because the follow-up sample included a subgroup of the initial sample, it may not be completely representative of the initial sample. Relatively, participants resided in the northeastern United States, and may not be representative of young people living outside of this region. Adolescents also reported on their parents’ drinking behaviors. However, research has indicated that adolescents’ and their parents’ perceptions of parental drinking behaviors are highly correlated (Crews and Sher, 1992). Nevertheless, future research using other measures of parental drinking (parent reports, diagnostic interviews) would be informative.

Despite these limitations, consistent with family systems theory (Broderick, 1993), findings from this study underscore the need to consider the drinking behavior of both parents in tandem with one another. Clearly, the examination of only one parent yields an incomplete picture of the impact of parental problem drinking on youth psychological adjustment. Moreover, the findings emphasize the need to consider problem drinking as dynamic, and changing over time, as opposed to a static or stable behavior. Indeed, changes in parental drinking behavior have unique implications for the development of anxiety. In addition to the examination of the drinking behaviors of both parents, particular attention should be paid to maternal problem drinking given that it appears to be a salient risk factor for anxiety during adolescence and emerging adulthood.

CRediT authorship contribution statement

Christine McCauley Ohannessian conceptualized the design of the study and implemented the study. She also took the lead in writing the manuscript. Anna Vannucci conducted the statistical analyses and created the tables and figures. In addition, she wrote the results section. Both authors have approved the final version of the manuscript.

Role of the funding source

This research was supported by the National Institutes of Health. NIH had no involvement in the study design, data collection, data analysis, interpretation of data, the writing of the manuscript, or the decision to submit the article for publication.

Data statement

The data used for this study are available upon request.

Conflict of Interest

None.

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