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## Longitudinal Prediction of Early Childhood Discipline Styles among Heavy Drinking Parents

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### Abstract

This study sought to examine predictors of parenting trajectories in a sample of heavy drinking and abstaining/light drinking parents. Mixture modeling was used to estimate trajectories of parental discipline styles over time. Two dimensions of parenting were examined: laxness and overreactivity. Changes in these dimensions were examined for each parent. Trajectories for mothers and fathers were very similar and were generally stable from 18 months to 5–6 years child age. Fathers' binge drinking was associated with high levels of both paternal and maternal overreactivity. Mothers with depressed affect had the highest levels of overreactivity, whereas fathers reporting depressed affect were more likely to have moderate levels of laxness. Mothers with high levels of marital satisfaction were more likely to have partners in the stable low overreactivity group. Findings begin to elucidate the nature of early family processes that may contribute to maladaptive child outcomes in heavy drinking families.

### 1. Introduction

The current study examines the use of discipline techniques longitudinally in a community sample of heavy drinking parents from toddlerhood to entry into school. This is a period of rapid developmental change for children and is a challenging period for parents with regard to discipline techniques. Heavy drinking families may be more likely to use non-optimal disciplining. Heavy drinking parents tend to have higher levels of parental depression, antisocial behavior, and marital distress which can also negatively impact parenting. Few

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studies have examined longitudinal trajectories of disciplining as a function of heavy drinking and associated risk characteristics.

## 2. Method

### 2.1. Participants & Procedures

The participants were 226 families with 12 month old infants at the time of recruitment (110 girls and 116 boys) who were paid for participation in an ongoing longitudinal study of parenting and infant development. Demographic characteristics of the sample can be found in Table 1. A full description of recruitment procedures can be found in Eiden, Edwards, and Leonard (2007). Children in the study were not exposed to alcohol or other drugs in the prenatal period. Families were classified as being in one of two major groups on the basis of DSM-IV criteria: the non-heavy drinking group ( $n = 102$ ), and the father heavy drinking group ( $n = 124$ ). Within the father heavy drinking group, 92 mothers were light drinking or abstaining and 32 mothers were heavy drinking or had current alcohol problems. Questionnaire data obtained at 12, 24, 36, 48, and 60 months of child age are the basis for the analyses (see Table 1 for means and standard deviations of all variables).

### 2.2. Measures

**2.2.1. Discipline**—Two subscales, laxness and overreactivity, of The Parenting Scale (Arnold et al., 1993) were used to measure the degree of dysfunctional discipline by each parent.

**2.2.2. Alcohol Involvement**—A quantity-frequency measure of alcohol (QFI, Cahalan, Cisin, & Crossley, 1969) was used to obtain a measure of average daily ethanol intake for both parents. Parents were also asked to report their frequency of binge drinking (>5 drinks at one sitting). For the analyses, binge drinking was dichotomized into never in the past year vs. ever in the past year.

**2.2.3. Risk Characteristics**—At 12 months, depressed affect was assessed using the depressed affect subscale of the Center for Epidemiologic Studies-Depression Scale (CES-D, Radloff, 1977), antisocial behavior using 28 items from the Antisocial Behavior Inventory (ASB, Zucker & Noll, 1980), and marital quality with the Marital Adjustment Test (MAT, Locke & Wallace, 1959).

### 2.3. Analytic Approach

To estimate trajectories of discipline styles over time, mixture models were estimated using the SAS procedure TRAJ (Jones, Nagin, & Roeder, 2001). This semi-parametric procedure uses longitudinal data to estimate group membership. Missing data is accommodated through the use of a maximum likelihood estimation procedure (Jones et al., 2001). Two, three, four, and five group models were tested separately for fathers and mothers. To compare models, Bayesian Information Criteria (BIC), parsimony, group size, and standard errors were examined (Nagin, 1999). To consider change over time, polynomial functions were tested. A significant zero order polynomial indicates no change over time, whereas a first order and second order polynomial describes linear and quadratic changes over time, respectively (Nagin, 1999).

After the appropriate single trajectory model was identified, a dual trajectory model was estimated. Dual trajectory models estimate the trajectories of two distinct but related items (Nagin & Tremblay, 2001). In the case of the current report, these two related items are the frequency of lax and overreactive disciplining behaviors. These two responses are significantly correlated across time but are distinct because they represent two aspects of ineffective

parenting. The dual trajectory approach produces estimates of the conditional probability of one trajectory given the other trajectory (Nagin & Tremblay, 2001); that is, the probability of mothers' laxness was estimated on the basis of their overreactivity. To predict membership into each of these separate trajectory classes, multinomial logistic regression models were utilized. Each model included both maternal and paternal 12 month alcohol use, depressed affect, relationship quality, and antisocial behaviors.

### 3. Results

#### 3.1. Mothers' Parenting Trajectories

Single trajectory models were examined individually for mothers' laxness and mothers' overreactivity. For both models, three group trajectory models fit the data best. The dual trajectory model incorporated the three group mothers' laxness outcome with the three group mothers' overreactivity outcome into one final model (Figure 1). Although both outcomes are in one model, for clarity they are presented separately.

For mothers' laxness, 42.9% of the mothers fit into the stable low group of laxness. The zero order trajectory was the only significant parameter (coefficient = 2.08,  $p < .001$ ) indicating that this trajectory group did not experience any significant change over time. Group 2 consisted of slightly more than one third of the mothers (38.9%). This group consisted of mothers' whose laxness was also stable over time, but at a higher level at all time points (zero order parameter: coefficient = 2.92,  $p < .001$ ). The final trajectory group characterized 18.3% of the mothers. This group started at the highest levels of laxness which peaked at 3 years and then gradually declined. The quadratic parameter was significant in the model (coefficient =  $-.05$ ,  $p < .05$ ).

For mothers' overreactivity, 36.1% of the women were in a group that started low in the frequency of overreactivity and gradually increased over time. This linear increase was significant (coefficient =  $.05$ ,  $p < .01$ ). The second group started at higher levels of overreactivity and experienced a significant, linear increase over time (coefficient =  $.09$ ,  $p < .001$ ). About half of the mothers (49.4%) fit into this moderate overreactivity group. The final group of mothers (14.6%) started at highest level of overreactivity, increased over time and then slightly decreased. Although the change over time appeared to be quadratic, this parameter was not significant (coefficient =  $-.03$ ,  $p = .17$ ). The trend over time was a significant linear change (coefficient =  $.28$ ,  $p < .01$ ).

Conditional probabilities were estimated for mothers' parenting styles. As expected, mothers who were categorized as being in the lowest overreactivity group were likely to also be in the lowest trajectory for laxness (probability = 0.71). Mothers in the second overreactivity group were most likely to be in the second trajectory class for laxness (probability = 0.51). Mothers characterized at the highest level of overreactivity were equally likely to be in the second (probability = .43) or third trajectory group for laxness (probability = 0.42).

#### 3.2. Fathers' Parenting Trajectories

As was done with the models examining mothers' parenting styles, several single trajectory models were estimated for fathers' laxness and fathers' overreactivity. For both laxness and overreactivity, the three group models fit the data best. The dual trajectory model incorporated the three group fathers' laxness outcome with the three group fathers' overreactivity outcome into one final model (Figure 2). Although both outcomes are in one model, for clarity they are presented separately.

Slightly more than one third of the fathers (34.3%) were in the group characterized by low initial levels of laxness. Although it appeared that there was a slight decline in frequency of laxness over time, this trend was not significant as indicated by only the zero order parameter

being significant (coefficient = 2.02,  $p < .001$ ). Similarly, the second trajectory also did not change significantly over time. This group remained in the moderate range for laxness (zero order parameter = 2.90,  $p < .001$ ). Approximately 43.5% of fathers were classified into this second trajectory group. The third group (22.2% of fathers) had a significant quadratic effect indicating that there was a significant increase at 24 months of child age, and then a decrease over time (coefficient =  $-0.06$ ,  $p < .05$ ).

For fathers' overreactivity, almost half of the fathers' (48.9%) were in the low, increasing group. The linear increase over time was significant (coefficient =  $.06$ ,  $p < .01$ ). The second trajectory group started at higher levels of overreactivity but did not change over time (zero order parameter: coefficient =  $3.0$ ,  $p < .001$ ). This group consisted of 44.1% of fathers. The final group, characterized by higher initial levels of overreactivity, a sharp increase, and then a leveling off period, consisted of about 7% of fathers. The quadratic trend was significant at a trend level (coefficient =  $-0.08$ ,  $p = .057$ ).

Conditional probabilities were estimated for fathers' parenting styles. Similar to mothers' parenting styles, fathers who were low in overreactivity were also likely to be characterized as low in laxness (probability =  $.49$ ). Fathers who were in the second trajectory group of overreactivity were likely to be in group 2 for laxness (probability =  $.54$ ). Fathers whose parenting style was characterized as highly overreactive were most likely to be characterized in the highest group of laxness (probability =  $.58$ ).

### 3.3. Predicting Membership into Parenting Trajectories

Two sets of multinomial logistic regression models (one for mothers' parenting and one for fathers' parenting) were used to identify variables from the 12-month assessment that would predict membership into these trajectory classes. Individual and partner's psychological, relationship, and substance use variables were modeled as baseline predictors after controlling for sociodemographic covariates. It is important to note that the trajectories cover the 18 month to kindergarten assessments, and the variables being considered as predictors were assessed at 12 months.

Mothers with higher levels of depressed affect at 12 months were significantly more likely to be either in trajectory group two, characterized by higher initial levels of overreactivity with a significant increase over time (Table 2), or in trajectory group three characterized by the highest levels of overreactivity that increased over time the compared to group one. Mothers' who had binge drinking partners were more likely to be in trajectory group three compared to group one. This finding was significant at a trend level. In terms of predicting membership into the laxness parenting trajectories, none of the predictors was significant in the final models.

With regard to overreactivity, fathers' who engaged in binge drinking at the 12 month assessment were more likely to be in group three compared to group one (Table 3). None of the other father variables was significant in the final models. Mothers with greater levels of marital satisfaction were less likely to have partners in group three compared to group one. For the second model that considered laxness, fathers with lower levels of depressed affect were slightly more likely to be characterized in the second trajectory of laxness compared to the first group. None of the other individual or partner variables was significant in the final models.

## 4. Discussion

This study examined predictors of parenting styles for the four years preceding entry into kindergarten. Parenting trajectories were markedly similar for both mothers and fathers. The significant quadratic trends that emerged in parents' overreactivity and laxness may be reflective of normative developmental trends in acting out behavior occurring around three

years of age. It should also be noted that mothers and fathers tended to be in similar groups for both laxness and overreactivity, such that parents reporting low levels of laxness also reported low levels of overreactivity and vice versa. While these appeared to be separate constructs in that they were differentially predicted, the data may be a reflection of general child rearing distress with parents fluctuating between permissive and indulgent parenting and more punitive, harsh parental responses.

When predictors of parenting were examined, fathers' binge drinking was associated with high levels of both paternal and maternal overreactivity as expected, suggesting that these parents were harsher and more demanding in their parenting. This finding is consistent with previous studies and suggests that a possible contributor to poor child outcomes heavy drinking families is disrupted parenting. It is suspected that the presence of binge drinking in the model may have attenuated the effects of antisocial behavior on parenting as they are highly correlated ( $r = .40$ ). Mothers' heavy drinking, however, was not associated with parenting. This may be due to the relatively small number of mothers engaging in binge drinking activity in the present sample. Depression clearly played a role in the prediction of mothers' parenting trajectories. Mothers with depressed affect were more likely to be in the two groups with the highest levels of overreactivity. Previous studies suggest that depressed parents may be more negatively reactive to children's challenging and coercive behavior than non-depressed parents (Leung & Slep, 2006). The relationship between fathers' depression and parenting was largely insignificant and may be due to the fact that paternal depression in the present study was relatively low, and largely sub-clinical compared to that of mothers.

Contrary to expectations, the present study did not generally find an association between marital satisfaction and parenting behavior. However, mothers with high levels of marital satisfaction were more likely to have partners in the stable low overreactivity group, suggesting these men were more sensitive and controlled in their discipline techniques. The relative lack of association between marital satisfaction and parenting may be due to the shared variance accounted for by parental psychological functioning variables such as depression and antisocial behavior. However, this is an area that will require more exploration.

Some study limitations should be noted. The sample was largely middle class and well-educated and as a community sample, levels of average daily alcohol consumption antisocial behavior and depression were also identified at largely sub-clinical levels. As a consequence, we would view our results to be conservative.

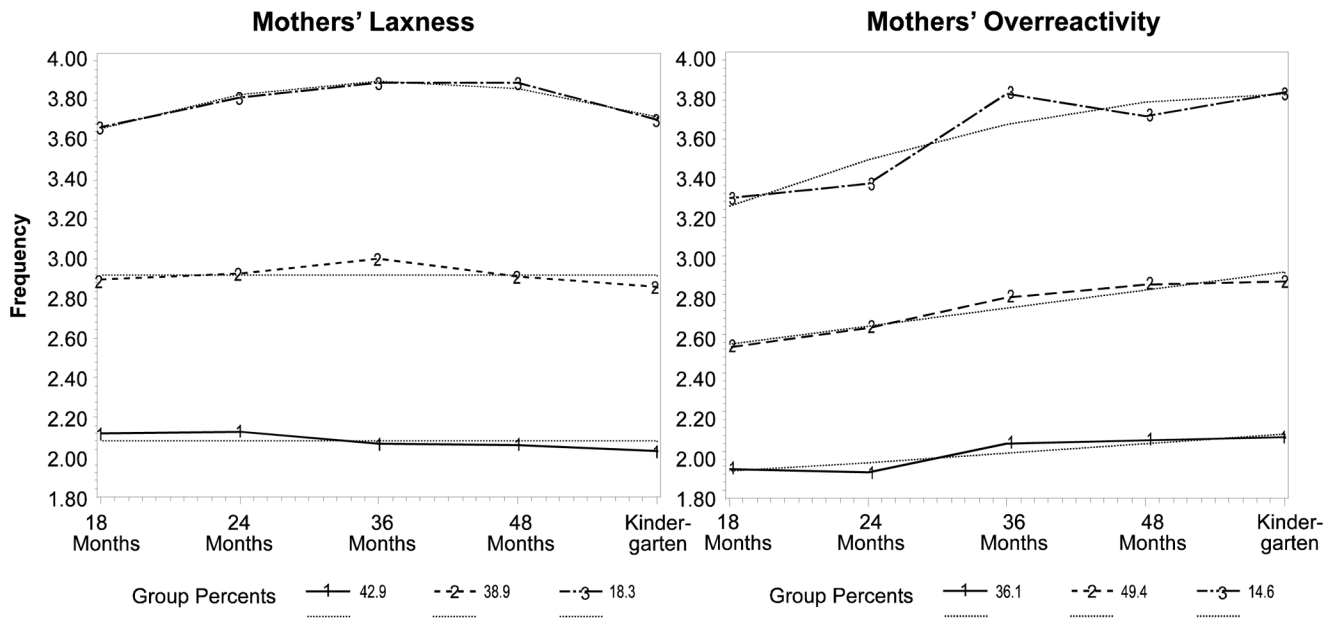
The current manuscript helps elucidate early family processes in heavy drinking families. Few studies have examined parental discipline in beginning in the toddler years. These results demonstrate that parenting styles are developed and maintained very early in a child's life and may be negatively affected by parental heavy drinking and concomitant pathology and marital stress. These parenting trajectories generally appear to be quite stable. After the preschool period, child behavior problems and parenting practices quickly become more entrenched and less amenable to treatment. Thus, early identification of parenting trends in high risk groups may assist in targeting mothers and fathers who would benefit from prevention and intervention efforts.

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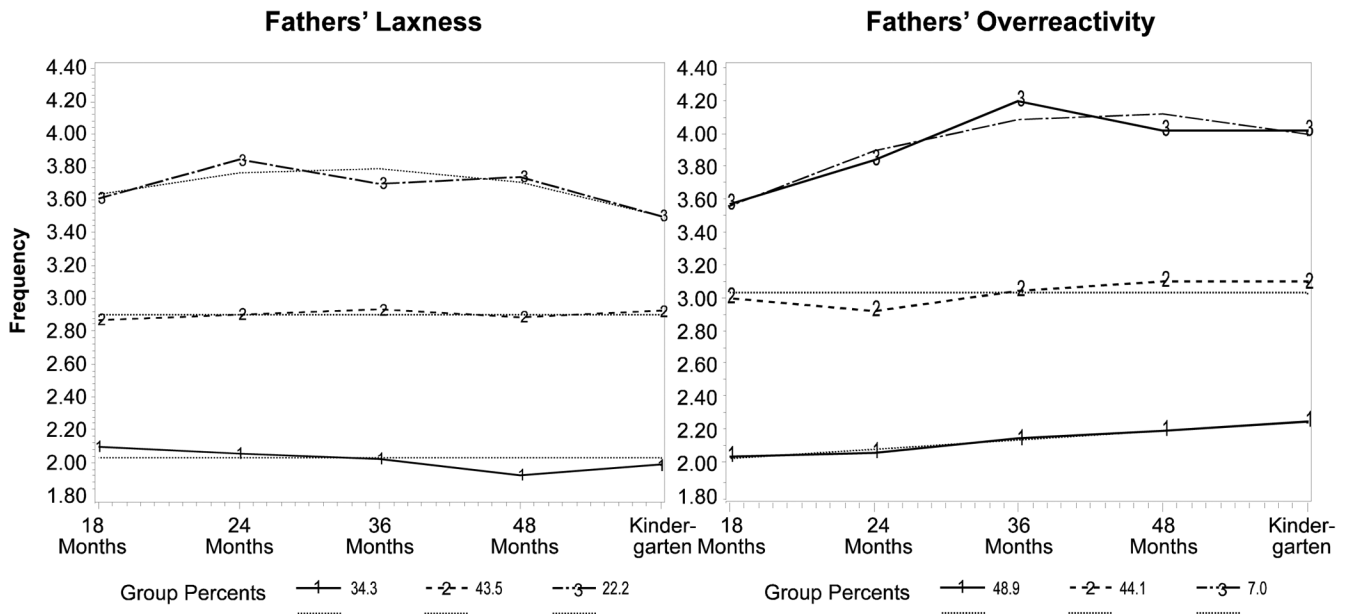
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**Figure 1. Mothers' Parenting Style Trajectories**

Note: Percents may not add to 100% due to rounding. The small dotted lines are the expected curves.





**Figure 2. Fathers' Parenting Style Trajectories**

Note: Percents may not add to 100% due to rounding. The small dotted lines are the expected curves.



**Table 1**

Descriptive information by group status

Variables	Fathers		Mothers	
	Mean	SD	Mean	SD
Alcohol QFI	.94	1.13	.15	.25
Binge Drinking	.70	.46	.39	.49
Depression	7.61	7.01	8.51	7.35
Antisocial Behavior	39.75	8.89	35.95	5.47
Marital Satisfaction	102.44	24.12	100.76	26.81
Overreactivity 18 months	2.57	.74	2.42	.65
Overreactivity 24 months	2.56	.71	2.47	.72
Overreactivity 36 months	2.68	.81	2.66	.73
Overreactivity 48 months	2.74	.76	2.70	.73
Overreactivity 60 months	2.74	.77	2.69	.73
Laxness 18 months	2.77	.73	2.71	.75
Laxness 24 months	2.80	.84	2.74	.82
Laxness 36 months	2.76	.79	2.74	.80
Laxness 48 months	2.74	.84	2.74	.86
Laxness 60 months	2.71	.74	2.61	.81
Age	33.00	7.20	31.00	4.31
Number of Children	2.11	.88	2.11	.88
Education:				
Less than H.S.	4%		2%	
High School	44%		39%	
Assoc./Voc.	20%		30%	
College Degree	26%		26%	
Graduate Degree	3%		6%	
Race:				
Caucasian	90%		94%	
African American	7%		4%	
Hispanic/Native Am.	3%		2%	
Employed	93%		63%	
Married	88%		88%	

*Note.* All couples were co-habiting at time of recruitment.

**Table 2**  
Multinomial Logistic Regression Models for Mothers' Parenting

	Mothers' Laxness			Mothers' Overreactivity		
	RR	Standard Error	95% Confidence Interval	RR	Standard Error	95% Confidence Interval
<b>Trajectory Group 2</b>						
<b>Individual Factors</b>						
M ASB	1.04	0.04	0.98,1.12	0.98	0.03	0.92,1.05
M MAT	1.00	0.01	0.99,1.02	1.01	0.01	0.99,1.02
M CES-D	1.03	0.08	0.89,1.20	1.22*	0.11	1.02,1.45
M QFI	1.76	1.35	0.39,7.96	1.20	0.85	0.30,4.82
M Binge	0.92	0.35	0.44,1.93	0.83	0.32	0.40,1.75
<b>Partner Factors</b>						
F ASB	1.00	0.02	0.96,1.04	1.00	0.02	0.96,1.04
F MAT	1.00	0.01	0.98,1.01	1.00	0.01	0.98,1.01
F CES-D	0.90	0.09	0.74,1.09	0.99	0.10	0.81,1.20
F QFI	1.12	0.19	0.81,1.55	0.92	0.16	0.66,1.30
F Binge	0.93	0.37	0.43,2.03	1.23	0.48	0.57,2.64
<b>Covariates</b>						
M Race/Ethnicity	0.93	0.69	0.21,4.03	1.79	1.24	0.46,6.93
M Marital status	1.03	0.55	0.36,2.91	0.72	0.38	0.26,2.01
M Work	1.23	0.40	0.64,2.33	0.90	0.29	0.48,1.69
M Education	1.02	0.13	0.80,1.30	0.98	0.12	0.78,1.25
No. Children	1.26	0.24	0.87,1.82	0.99	0.18	0.69,1.42
<b>Trajectory Class 3</b>						
<b>Individual Factors</b>						
M ASB	1.03	0.05	0.95,1.13	1.00	0.05	0.91,1.10
M MAT	0.99	0.01	0.97,1.01	1.00	0.01	0.98,1.02
M CES-D	0.85	0.10	0.68,1.06	1.26*	0.14	1.01,1.57
M QFI	2.39	2.08	0.43,13.17	0.49	0.53	0.06,4.06
M Binge	0.90	0.43	0.36,2.29	1.12	0.58	0.40,3.11
<b>Partner Factors</b>						
F ASB	0.99	0.03	0.93,1.04	1.02	0.03	0.97,1.08
F MAT	1.01	0.01	0.99,1.03	1.01	0.01	0.99,1.03
F CES-D	0.86	0.12	0.64,1.14	0.97	0.14	0.74,1.29
F QFI	1.03	0.21	0.70,1.53	1.22	0.24	0.84,1.78
F Binge	2.00	1.05	0.72,5.60	3.07 <sup>+</sup>	2.06	0.82,11.45
<b>Covariates</b>						
M Race/ethnicity	0.36	0.29	0.07,1.78	1.90	1.83	0.29,12.54
M Marital status	0.64	0.39	0.20,2.08	0.81	0.56	0.21,3.15
M Work	0.97	0.39	0.44,2.15	0.82	0.39	0.32,2.08
M Education	1.21	0.18	0.90,1.63	1.26	0.22	0.89,1.77
No. Children	1.02	0.24	0.64,1.63	0.89	0.25	0.52,1.53

Note. RR: Relative Risk; M: Mother; F: Father; ASB: Antisocial Behavior; MAT: Marital Adjustment Test; CES-D: Center for Epidemiologic Studies Depression Scale (Depressed Affect Subscale); QFI: Quantity/Frequency of Alcohol Use; Binge: Past year binge drinking (yes/no). Reference Group is Trajectory Group 1.

<sup>+</sup> p<.1

\* p<.05

\*\*\* p<.01

\*\*\*  
p<.001

**Table 3**  
Multinomial Logistic Regression Models for Fathers' Parenting

	Fathers' Laxness			Fathers' Overreactivity		
	RR	Standard Error	95% Confidence Interval	RR	Standard Error	95% Confidence Interval
<b>Trajectory Group 2</b>						
<b>Individual Factors</b>						
F ASB	1.00	0.02	0.96,1.04	1.01	0.02	0.97,1.05
F MAT	1.00	0.01	0.98,1.02	0.99	0.01	0.98,1.01
F CES-D	0.81 <sup>+</sup>	0.09	0.65,1.00	0.94	0.09	0.78,1.14
F QFI	1.07	0.18	0.76,1.50	0.89	0.14	0.66,1.20
F Binge	1.12	0.47	0.50,2.54	1.09	0.41	0.52,2.28
<b>Partner Factors</b>						
M ASB	1.02	0.04	0.95,1.09	1.04	0.03	0.98,1.11
M MAT	0.99	0.01	0.98,1.00	1.00	0.01	0.99,1.02
M CES-D	0.88	0.07	0.74,1.03	0.94	0.07	0.81,1.09
M QFI	1.21	0.99	0.24,6.07	1.85	1.30	0.47,7.36
M Binge	1.42	0.57	0.65,3.12	1.15	0.41	0.57,2.30
<b>Covariates</b>						
F Race/Ethnicity	1.03	0.62	0.32,3.33	1.92	1.07	0.64,5.75
F Marital status	1.40	0.78	0.47,4.20	0.83	0.41	0.31,2.18
F Work	0.34	0.25	0.08,1.47	0.51	0.30	0.16,1.64
F Education	1.03	0.12	0.83,1.28	0.94	0.10	0.77,1.15
No. Children	0.95	0.19	0.65,1.40	0.99	0.18	0.70,1.40
<b>Trajectory Class 3</b>						
<b>Individual Factors</b>						
F ASB	1.00	0.03	0.94,1.05	1.00	0.05	0.91,1.10
F MAT	1.00	0.01	0.98,1.02	1.01	0.02	0.98,1.04
F CES-D	1.01	0.12	0.80,1.27	0.78	0.19	0.48,1.26
F QFI	1.06	0.24	0.68,1.65	0.52	0.24	0.21,1.28
F Binge	0.57	0.29	0.21,1.52	7.62*	6.86	1.30,44.51
<b>Partner Factors</b>						
M ASB	1.00	0.04	0.92,1.08	1.01	0.08	0.87,1.18
M MAT	0.99	0.01	0.97,1.01	0.97*	0.01	0.95,0.99
M CES-D	1.02	0.09	0.85,1.22	0.98	0.13	0.75,1.28
M QFI	2.91	2.65	0.49,17.31	6.19	9.44	0.31,122.88
M Binge	1.53	0.74	0.59,3.94	0.32	0.26	0.07,1.59
<b>Covariates</b>						
M Race/ethnicity	1.38	1.03	0.32,5.99	1.04	1.33	0.08,12.78
M Marital status	0.72	0.46	0.20,2.55	1.53	1.89	0.13,17.30
M Work	0.64	0.58	0.11,3.78	0.62	0.77	0.05,6.99
M Education	1.06	0.14	0.81,1.39	1.25	0.25	0.85,1.86
No. Children	1.09	0.26	0.69,1.73	1.14	0.41	0.56,2.31

Note. RR: Relative Risk; M: Mother; F: Father; ASB: Antisocial Behavior; MAT: Marital Adjustment Test; CES-D: Center for Epidemiologic Studies Depression Scale (Depressed Affect Subscale); QFI: Quantity/Frequency of Alcohol Use; Binge: Past year binge drinking (yes/no). Reference Group is Trajectory Group 1.

<sup>+</sup> p<.1

\* p<.05

\*\*\* p<.01

\*\*\*  
p<.001