

Appendix A: Binge Drinking, Marijuana Use and Hard Drug Use Group-Based Trajectory Modeling (GBTM) Stata syntax, parameters, BIC and AIC scores

Binge drinking, 5-class quadratic

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traj, model(logit) var(Y1_anybinge22 Y1_anybinge23 Y1_anybinge24 Y1_anybinge25
Y1_anybinge26 Y1_anybinge27 Y1_anybinge28 Y1_anybinge29 Y1_anybinge30_new
Y1_anybinge31_new Y1_anybinge32_new Y1_anybinge33 Y1_anybinge34
Y1_anybinge35 Y1_anybinge36) indep(t_1-t_15) order(2 2 2 2 2)
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143744 observations read.

7888 had no trajectory data.

135856 observations used in the trajectory model.

Maximum Likelihood Estimates

Model: Logistic (logit)

Group	Parameter	Standard Estimate	Standard Error	T for H0: Parameter=0	Prob > T
1	Intercept	0.53353	0.06617	8.063	0.0000
	Linear	-0.50069	0.01519	-32.965	0.0000
	Quadratic	0.02505	0.00106	23.546	0.0000
2	Intercept	-3.23974	0.10382	-31.205	0.0000
	Linear	-0.16974	0.02143	-7.919	0.0000
	Quadratic	0.02240	0.00120	18.740	0.0000
3	Intercept	3.22529	0.11119	29.008	0.0000
	Linear	-0.70931	0.03007	-23.591	0.0000
	Quadratic	0.03409	0.00181	18.790	0.0000
4	Intercept	-1.59225	0.04901	-32.486	0.0000
	Linear	0.40391	0.01484	27.223	0.0000
	Quadratic	-0.02020	0.00093	-21.800	0.0000
5	Intercept	1.72572	0.03948	43.709	0.0000
	Linear	0.25192	0.01618	15.575	0.0000
	Quadratic	-0.02000	0.00107	-18.664	0.0000

Group membership

1	(%)	19.24464	0.54007	35.634	0.0000
2	(%)	38.10001	0.57040	66.795	0.0000

3	(%)	10.11216	0.34600	29.226	0.0000
4	(%)	16.30164	0.38315	42.546	0.0000
5	(%)	16.24154	0.25417	63.899	0.0000

BIC=-470454.77 (N=933728) BIC=-470436.46 (N=135856) AIC=-470343.17 ll= -470324.17

Entropy = 0.580

Marijuana Use, 5-class linear

traj, model (logit) var(Y2_marij22 Y2_marij23 Y2_marij24 Y2_marij25 Y2_marij26
Y2_marij27 Y2_marij28 Y2_marij29 Y2_marij30_new Y2_marij31_new Y2_marij32_new
Y2_marij33 Y2_marij34 Y2_marij35 Y2_marij36) indep (t_1-t_15) order (1 1 1 1 1)

143744 observations read.

7424 had no trajectory data.

136320 observations used in the trajectory model.

Maximum Likelihood Estimates

Model: Logistic (logit)

Group	Parameter	Standard Estimate	T for H0: Error	Parameter=0	Prob > T
1	Intercept	-4.93650	0.17398	-28.374	0.0000
	Linear	0.14326	0.01494	9.590	0.0000
2	Intercept	-2.06105	0.06457	-31.920	0.0000
	Linear	-0.74533	0.06967	-10.698	0.0000
3	Intercept	0.39620	0.05051	7.845	0.0000
	Linear	-0.21449	0.01085	-19.764	0.0000
4	Intercept	-2.21945	0.06328	-35.075	0.0000
	Linear	0.29219	0.01194	24.470	0.0000
5	Intercept	2.03220	0.02935	69.231	0.0000
	Linear	-0.03358	0.00427	-7.873	0.0000

Group membership

1	(%)	46.09268	1.07094	43.039	0.0000
2	(%)	30.02355	1.10151	27.257	0.0000
3	(%)	9.38362	0.29747	31.544	0.0000
4	(%)	6.31695	0.31608	19.986	0.0000
5	(%)	8.18319	0.09800	83.498	0.0000

BIC=-266529.31 (N=988752) BIC=-266515.44 (N=136320) AIC=-266446.68 ll= -266432.68

Entropy = 0.541

Hard drug use, 5-class cubic

traj, model (logit) var(Y4_harddrugs22 Y4_harddrugs23 Y4_harddrugs24
Y4_harddrugs25 Y4_harddrugs26 Y4_harddrugs27 Y4_harddrugs28 Y4_harddrugs29
Y4_harddrugs30 Y4_harddrugs31 Y4_harddrugs32 Y4_harddrugs33 Y4_harddrugs34
Y4_harddrugs35 Y4_harddrugs36) indep (t_1-t_15) order (3 3 3 3 3)

143744 observations read.

8688 had no trajectory data.

135056 observations used in the trajectory model.

Maximum Likelihood Estimates

Model: Logistic (logit)

Group	Parameter	Standard Estimate	T for H0: Error	Parameter=0	Prob > T
1	Intercept	13.55591	1.71689	7.896	0.0000
	Linear	-5.53573	0.69024	-8.020	0.0000
	Quadratic	0.64511	0.08968	7.193	0.0000
	Cubic	-0.02415	0.00363	-6.662	0.0000
2	Intercept	-3.00444	0.07766	-38.686	0.0000
	Linear	-1.19103	0.08049	-14.797	0.0000
	Quadratic	0.15633	0.01492	10.478	0.0000
	Cubic	-0.00594	0.00071	-8.307	0.0000
3	Intercept	-0.97775	0.11453	-8.537	0.0000
	Linear	0.38491	0.05907	6.516	0.0000
	Quadratic	-0.12567	0.01062	-11.838	0.0000
	Cubic	0.00652	0.00051	12.881	0.0000
4	Intercept	-0.74128	0.13729	-5.400	0.0000
	Linear	-0.90098	0.12591	-7.156	0.0000
	Quadratic	0.19970	0.02281	8.756	0.0000
	Cubic	-0.00980	0.00107	-9.130	0.0000
5	Intercept	-0.80963	0.11447	-7.073	0.0000
	Linear	1.06022	0.08569	12.373	0.0000
	Quadratic	-0.16043	0.01521	-10.545	0.0000

Cubic	0.00636	0.00072	8.816	0.0000
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Group membership

1	(%)	0.73993	0.06488	11.405	0.0000
2	(%)	89.04578	0.25628	347.455	0.0000
3	(%)	6.39390	0.25775	24.807	0.0000
4	(%)	2.37439	0.16842	14.098	0.0000
5	(%)	1.44600	0.08621	16.773	0.0000

BIC=-121005.24 (N=968528) BIC=-120981.59 (N=135056) AIC=-120863.83 ll= -120839.83

Entropy = 0.875

Appendix B: Multinomial Logistic Regression Models, Binge Drinking Classes

Table B1. Multinomial logistic regression, association between **conviction** and binge drinking (Table 5 in the paper)

Binge drinking class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B)	
				Lower Bound	Std. Error
Decreasers into 30's (1)	Intercept	.002			
	Convicted	.001	1.688	1.684	1.692
	Marital status	.000	1.074	1.073	1.075
	Children	.000	.951	.951	.952
	Juvenile arrest	.001	.945	.943	.947
	Juvenile binge drinking	.001	2.328	2.324	2.332
	Juvenile MJ use	.001	1.823	1.820	1.826
	Crime victim, 2002	.002	.698	.696	.700
	Crime victim, 2007	.002	1.315	1.311	1.319
	Gender	.001	.600	.599	.601
	Race/ethnicity	.000	1.142	1.142	1.143
	Education	.000	.997	.996	.998
High drinkers, decrease then increase (3)	Intercept	.002			
	Convicted	.002	1.566	1.561	1.571
	Marital status	.001	1.050	1.049	1.052
	Children	.000	.882	.881	.882
	Juvenile arrest	.001	.848	.846	.850
	Juvenile binge drinking	.001	2.770	2.764	2.776
	Juvenile MJ use	.001	1.762	1.758	1.766
	Crime victim, 2002	.002	.830	.827	.834
	Crime victim, 2007	.002	1.358	1.352	1.363
	Gender	.001	.306	.305	.306
	Race/ethnicity	.000	1.381	1.380	1.382
	Education	.001	1.156	1.155	1.158
Steady drinkers (4)	Intercept	.002			
	Convicted	.001	1.985	1.980	1.990
	Marital status	.000	1.064	1.063	1.065
	Children	.000	.916	.915	.916

	Juvenile arrest	.001	.814	.812	.816
	Juvenile binge drinking	.001	1.887	1.884	1.891
	Juvenile MJ use	.001	1.580	1.577	1.583
	Crime victim, 2002	.001	1.031	1.028	1.034
	Crime victim, 2007	.002	1.776	1.770	1.781
	Gender	.001	.530	.529	.531
	Race/ethnicity	.000	1.003	1.002	1.003
	Education	.000	1.045	1.044	1.045
High, chronic drinkers (5)	Intercept	.002			
	Convicted	.001	1.574	1.570	1.578
	Marital status	.001	.979	.978	.981
	Children	.000	.907	.906	.907
	Juvenile arrest	.001	1.283	1.280	1.286
	Juvenile binge drinking	.001	3.874	3.866	3.882
	Juvenile MJ use	.001	1.572	1.568	1.575
	Crime victim, 2002	.002	1.584	1.579	1.589
	Crime victim, 2007	.002	.773	.769	.776
	Gender	.001	.186	.186	.187
	Race/ethnicity	.000	1.200	1.200	1.201
	Education	.001	1.202	1.201	1.203

Reference category = 2, low drinkers, increasing slightly into 30's
All Exp(B) statistics were statistically significant at $p \leq .01$.

Table B2. Multinomial logistic regression, association between **incarceration** and binge drinking (Table 5 in the paper)

Binge drinking class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B)	
				Lower Bound	Upper Bound
(1) Decreasers into 30's	Intercept	.002			
	Incarceration	.002	1.456	1.450	1.461
	Marital status	.000	1.065	1.064	1.066
	Children	.000	.950	.949	.950
	Juvenile arrest	.001	.982	.980	.984
	Juvenile binge drinking	.001	2.345	2.341	2.349
	Juvenile MJ use	.001	1.848	1.844	1.851
	Crime victim, 2002	.002	.707	.705	.709
	Crime victim, 2007	.002	1.322	1.318	1.326
	Gender	.001	.584	.583	.585
	Race/ethnicity	.000	1.148	1.147	1.149
	Education	.000	.987	.986	.988
(3) High drinkers, decrease then increase	Intercept	.002			
	Incarceration	.003	1.059	1.054	1.065
	Marital status	.001	1.040	1.039	1.041
	Children	.000	.881	.880	.881
	Juvenile arrest	.001	.884	.882	.887
	Juvenile binge drinking	.001	2.784	2.778	2.791
	Juvenile MJ use	.001	1.795	1.791	1.799
	Crime victim, 2002	.002	.847	.844	.851
	Crime victim, 2007	.002	1.359	1.353	1.365
	Gender	.001	.294	.294	.295
	Race/ethnicity	.000	1.387	1.386	1.388
	Education	.001	1.137	1.136	1.138
(4) Steady drinkers	Intercept	.002			
	Incarceration	.002	1.276	1.271	1.281

	Marital status	.000	1.050	1.049	1.051
	Children	.000	.914	.914	.915
	Juvenile arrest	.001	.865	.863	.867
	Juvenile binge drinking	.001	1.902	1.898	1.905
	Juvenile MJ use	.001	1.624	1.620	1.627
	Crime victim, 2002	.001	1.058	1.055	1.061
	Crime victim, 2007	.002	1.784	1.778	1.789
	Gender	.001	.501	.500	.502
	Race/ethnicity	.000	1.010	1.009	1.010
	Education	.000	1.020	1.019	1.021
High, chronic drinkers (5)	Intercept	.002			
	Incarceration	.002	.779	.776	.783
	Marital status	.001	.965	.964	.966
	Children	.000	.906	.905	.906
	Juvenile arrest	.001	1.348	1.345	1.351
	Juvenile binge drinking	.001	3.873	3.865	3.881
	Juvenile MJ use	.001	1.619	1.616	1.623
	Crime victim, 2002	.002	1.637	1.632	1.642
	Crime victim, 2007	.002	.767	.764	.771
	Gender	.001	.177	.176	.177
	Race/ethnicity	.000	1.207	1.206	1.208
	Education	.001	1.168	1.166	1.169

Reference category = 2, low drinkers, increasing slightly into 30's
All Exp(B) statistics were statistically significant at $p \leq .01$.

Appendix C: Multinomial Logistic Regression Models, Marijuana Use Classes

Table C1. Multinomial logistic regression, association between **conviction** and marijuana use (Table 6 in the paper)

Marijuana use class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B)	
				Lower Bound	Upper Bound
Low use (1)	Intercept	.003			
	Convicted	.002	.631	.629	.634
	Marital status	.001	1.192	1.190	1.195
	Children	.001	1.074	1.073	1.075
	Juvenile arrest	.002	1.016	1.013	1.020
	Juvenile binge drinking	.002	.727	.725	.730
	Juvenile MJ use	.002	.507	.506	.509
	Crime victim, 2002	.003	1.272	1.264	1.280
	Crime victim, 2007	.004	1.156	1.147	1.164
	Gender	.002	1.286	1.282	1.289
	Race/ethnicity	.001	1.044	1.042	1.045
	Education	.001	1.017	1.016	1.019
Decreasing use (3)	Intercept	.004			
	Convicted	.002	1.825	1.816	1.833
	Marital status	.001	1.213	1.210	1.215
	Children	.001	.949	.948	.951
	Juvenile arrest	.002	.806	.803	.809
	Juvenile binge drinking	.002	.855	.852	.859
	Juvenile MJ use	.002	1.608	1.602	1.615
	Crime victim, 2002	.003	2.433	2.416	2.449
	Crime victim, 2007	.004	2.182	2.165	2.199
	Gender	.002	1.157	1.153	1.161
	Race/ethnicity	.001	1.066	1.065	1.068

	Education	.001	.886	.885	.888
Increasing use (4)	Intercept	.004			
	Convicted	.003	1.837	1.828	1.846
	Marital status	.001	1.395	1.392	1.398
	Children	.001	.972	.971	.974
	Juvenile arrest	.002	1.103	1.098	1.108
	Juvenile binge drinking	.002	.792	.789	.795
	Juvenile MJ use	.002	1.109	1.104	1.113
	Crime victim, 2002	.004	2.243	2.227	2.259
	Crime victim, 2007	.004	1.394	1.382	1.406
	Gender	.002	1.174	1.169	1.178
	Race/ethnicity	.001	.899	.898	.901
	Education	.001	.849	.848	.851
Chronic use (5)	Intercept	.004			
	Convicted	.002	1.168	1.162	1.173
	Marital status	.001	.941	.939	.943
	Children	.001	.892	.891	.893
	Juvenile arrest	.002	1.585	1.578	1.592
	Juvenile binge drinking	.002	.918	.914	.922
	Juvenile MJ use	.002	2.103	2.094	2.112
	Crime victim, 2002	.004	1.548	1.537	1.559
	Crime victim, 2007	.004	1.299	1.288	1.310
	Gender	.002	.802	.799	.805
	Race/ethnicity	.001	1.000 ^a	.999	1.002
	Education	.001	1.216	1.214	1.219

Reference category = 2, very low use

^aAll Exp(B) statistics were statistically significant at $p \leq .01$ except for race/ethnicity in the chronic use class.

Table C2. Multinomial logistic regression, association between **incarceration** and marijuana use (Table 6 in the paper)

Marijuana use class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B)	
				Lower Bound	Upper Bound
Low use (1)	Intercept	.003			
	Incarceration	.004	1.403	1.391	1.415
	Marital status	.001	1.212	1.210	1.214
	Children	.001	1.074	1.073	1.075
	Juvenile arrest	.002	.965	.961	.968
	Juvenile binge drinking	.002	.723	.720	.725
	Juvenile MJ use	.002	.496	.495	.498
	Crime victim, 2002	.003	1.238	1.230	1.245
	Crime victim, 2007	.004	1.164	1.155	1.172
	Gender	.002	1.372	1.367	1.376
	Race/ethnicity	.001	1.036	1.035	1.038
	Education	.001	1.045	1.043	1.047
Decreasing use (3)	Intercept	.004			
	Incarceration	.004	2.925	2.899	2.950
	Marital status	.001	1.200	1.197	1.202
	Children	.001	.945	.944	.946
	Juvenile arrest	.002	.834	.831	.838
	Juvenile binge drinking	.002	.868	.864	.871
	Juvenile MJ use	.002	1.617	1.611	1.624
	Crime victim, 2002	.003	2.404	2.388	2.420
	Crime victim, 2007	.004	2.207	2.190	2.224
	Gender	.002	1.131	1.128	1.135
	Race/ethnicity	.001	1.080	1.078	1.081
	Education	.001	.883	.881	.885
Increasing use (4)	Intercept	.004			

	Incarceration	.005	1.250	1.237	1.262
	Marital status	.001	1.383	1.379	1.386
	Children	.001	.968	.967	.970
	Juvenile arrest	.002	1.183	1.178	1.188
	Juvenile binge drinking	.002	.792	.788	.795
	Juvenile MJ use	.002	1.137	1.132	1.142
	Crime victim, 2002	.004	2.275	2.259	2.291
	Crime victim, 2007	.004	1.391	1.379	1.403
	Gender	.002	1.070	1.066	1.075
	Race/ethnicity	.001	.909	.908	.911
	Education	.001	.820	.819	.822
Chronic use (5)	Intercept	.004			
	Incarceration	.005	2.347	2.326	2.368
	Marital status	.001	.943	.941	.946
	Children	.001	.889	.888	.890
	Juvenile arrest	.002	1.569	1.562	1.575
	Juvenile binge drinking	.002	.924	.920	.927
	Juvenile MJ use	.002	2.078	2.069	2.086
	Crime victim, 2002	.004	1.504	1.494	1.515
	Crime victim, 2007	.004	1.313	1.302	1.324
	Gender	.002	.823	.820	.826
	Race/ethnicity	.001	1.003	1.002	1.005
	Education	.001	1.235	1.233	1.238

Reference category = 2, very low use

All Exp(B) statistics were statistically significant at $p \leq .01$.

Appendix D: Multinomial Logistic Regression Models, Hard Drug Use Classes

Table D1. Multinomial logistic regression, association between **conviction** and hard drug use (Table 7 in the paper)

Drug use class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B)	
				Lower Bound	Upper Bound
Sharp decrease (1)	Intercept	.008			
	Conviction	.004	2.809	2.789	2.830
	Marital status	.002	.743	.740	.747
	Children	.001	.930	.928	.933
	Juvenile arrest	.004	1.688	1.676	1.700
	Juvenile binge drinking	.004	1.113	1.105	1.121
	Juvenile MJ use	.004	2.558	2.539	2.577
	Crime victim, 2002	.006	.888	.877	.898
	Crime victim, 2007	.006	1.939	1.918	1.961
	Gender	.003	.805	.800	.810
	Race/ethnicity	.002	1.361	1.357	1.365
	Education	.002	1.091	1.087	1.095
Slow decrease into low use (3)	Intercept	.003			
	Conviction	.002	1.904	1.897	1.910
	Marital status	.001	1.246	1.245	1.248
	Children	.001	.910	.909	.911
	Juvenile arrest	.001	1.860	1.855	1.865
	Juvenile binge drinking	.002	1.614	1.609	1.619
	Juvenile MJ use	.002	2.192	2.185	2.199
	Crime victim, 2002	.002	1.501	1.496	1.507
	Crime victim, 2007	.002	2.198	2.188	2.207
	Gender	.001	1.235	1.232	1.238
	Race/ethnicity	.001	1.120	1.119	1.121

	Education	.001	.916	.915	.917
Fluctuating low use (4)	Intercept	.005			
	Conviction	.003	4.144	4.124	4.165
	Marital status	.002	.839	.836	.841
	Children	.001	.846	.844	.848
	Juvenile arrest	.003	1.337	1.331	1.344
	Juvenile binge drinking	.003	1.845	1.835	1.854
	Juvenile MJ use	.003	2.009	1.998	2.019
	Crime victim, 2002	.003	1.730	1.719	1.741
	Crime victim, 2007	.005	1.072	1.062	1.082
	Gender	.002	1.491	1.484	1.498
	Race/ethnicity	.001	.909	.907	.911
	Education	.001	.924	.922	.927
Fluctuating high use (5)	Intercept	.007			
	Conviction	.003	1.141	1.134	1.149
	Marital status	.001	1.031	1.028	1.034
	Children	.001	.707	.706	.709
	Juvenile arrest	.003	1.441	1.433	1.449
	Juvenile binge drinking	.003	1.343	1.336	1.351
	Juvenile MJ use	.003	3.782	3.759	3.805
	Crime victim, 2002	.005	.970	.962	.979
	Crime victim, 2007	.005	1.591	1.575	1.607
	Gender	.003	.509	.507	.512
	Race/ethnicity	.002	1.628	1.623	1.633
	Education	.001	.925	.922	.927

Reference category = 2, non-use

All Exp(B) statistics were statistically significant at $p \leq .01$.

Table D2. Multinomial logistic regression, association between **incarceration** and hard drug use (Table 7 in the paper)

Drug use class		Std. Error	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound Upper Bound	
Sharp decrease (1)	Intercept	.008			
	Incarceration	.005	2.032	2.010	2.053
	Marital status	.002	.707	.703	.710
	Children	.001	.921	.919	.924
	Juvenile arrest	.004	1.855	1.842	1.868
	Juvenile binge drinking	.004	1.141	1.133	1.150
	Juvenile MJ use	.004	2.678	2.658	2.698
	Crime victim, 2002	.006	.887	.877	.897
	Crime victim, 2007	.006	1.934	1.913	1.956
	Gender	.003	.727	.722	.732
	Race/ethnicity	.002	1.399	1.395	1.404
	Education	.002	1.051	1.047	1.055
Slow decrease into low use (3)	Intercept	.003			
	Incarceration	.003	1.537	1.529	1.545
	Marital status	.001	1.227	1.226	1.229
	Children	.001	.905	.905	.906
	Juvenile arrest	.001	1.954	1.948	1.959
	Juvenile binge drinking	.002	1.633	1.628	1.638
	Juvenile MJ use	.002	2.246	2.239	2.253
	Crime victim, 2002	.002	1.513	1.507	1.519
	Crime victim, 2007	.002	2.190	2.181	2.199
	Gender	.001	1.165	1.161	1.168
	Race/ethnicity	.001	1.135	1.134	1.136
	Education	.001	.895	.894	.896
Fluctuating low use (4)	Intercept	.005			
	Incarceration	.003	4.765	4.736	4.795

	Marital status	.002	.810	.808	.813
	Children	.001	.837	.836	.839
	Juvenile arrest	.003	1.453	1.446	1.460
	Juvenile binge drinking	.003	1.916	1.906	1.925
	Juvenile MJ use	.003	2.069	2.058	2.079
	Crime victim, 2002	.003	1.672	1.662	1.683
	Crime victim, 2007	.005	1.123	1.112	1.133
	Gender	.002	1.431	1.424	1.438
	Race/ethnicity	.001	.951	.949	.952
	Education	.001	.911	.909	.913
Fluctuating high use (5)	Intercept	.007			
	Incarceration	.006	.646	.638	.654
	Marital status	.002	1.022	1.019	1.025
	Children	.001	.707	.705	.709
	Juvenile arrest	.003	1.457	1.449	1.465
	Juvenile binge drinking	.003	1.325	1.317	1.332
	Juvenile MJ use	.003	3.874	3.851	3.898
	Crime victim, 2002	.005	1.001 ^a	.992	1.010
	Crime victim, 2007	.005	1.560	1.544	1.575
	Gender	.003	.488	.485	.490
	Race/ethnicity	.002	1.634	1.629	1.638
	Education	.001	.907	.904	.909

Reference category = 2, non-use

^aAll Exp(B) statistics were statistically significant at $p \leq .01$ except for crime victim 2002.