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The Association of Early Risky Behaviors and Substance Dependence and Depression in an Ethnically Diverse Sample

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Background

- Early involvement with substances and other risky behaviors is associated with negative outcomes
 - Early substance use is correlated with substance dependence
 - Early manifestations of deviant behavior is also associated with substance abuse and dependence
- This study
 - Investigated the effects of risky behavior (substance use as well as other risk-taking behaviors) on outcomes of depression and substance abuse and dependence
 - Uses latent class analysis to group six variables to reflect traits of risky behaviors
 - Uses a diverse sample of African Americans and European Americans to test the differences between African Americans and European Americans in outcome due to early risky behavior
- Questions Asked
 - Is there a correlation between general early risky behavior and substance abuse/dependence and depression?
 - Is there a difference between African Americans and European Americans in such correlations?

Missouri Family Study (MOFAM)

- General population sample of families, ascertained using Missouri birth records
- Designed to be comparable to twin-family studies conducted in our research group
- Index children selected from birth years to be aged 13,15,17,or 19 at first interview
- Prospective design, with offspring interviewed every 2 years
- Oversample of African American families
- High risk design using telephone screening interviews with mothers to collect high risk families
 - Mothers of index child interviewed about family structure and her own health behaviors and those of the child's father
 - Families are designated high risk (HR) if mother reports child's father as an excessive drinker; otherwise low risk (LR)
- Second type of high risk family – families of men with 2 or more DUI's on driving record – "Recurrent Drunk Driving" or RDD families

Sample Characteristics

	<u>EA</u>	(%)	<u>AA</u>	(%)	<u>Total</u>
<u>Total</u>	n=444		487		931
<u>Female</u>	224	(50.5)	249	(51.1)	473
<u>Low Risk</u>	134	(30.2)	244	(50.1)	378
<u>High Risk</u>	105	(23.6)	140	(28.7)	245
<u>RDD</u>	205	(46.2)	103	(21.1)	308
<u>Mean Age</u>	18.54		18.87		18.71

- **Baseline Data** from MOFAM was used for the analysis
- Sexual Intercourse was used as a variable in a Latent Class Analysis. Respondents younger than age 15 were not asked questions about sexual intercourse and, therefore, were left out of the analysis.
- This results in a **931 Sample Total of Age 15 or older**

Note: RDD-Recurrent Drunk Driving Families, AA-African American, EA-European American

Latent Class Analysis

Variables included

Substance Use

- **Alcohol use**
- **Tobacco use**
- **Marijuana use**

Behavioral Variables

- **Oppositional Defiant Disorder**
- **Conduct Disorder**
- **Sexual Intercourse**

▪ Substance Use and Sexual Intercourse were categorized based on age onset:

- 0 = None
- 1 = Late
- 2 = Early (Youngest 25% of Users)

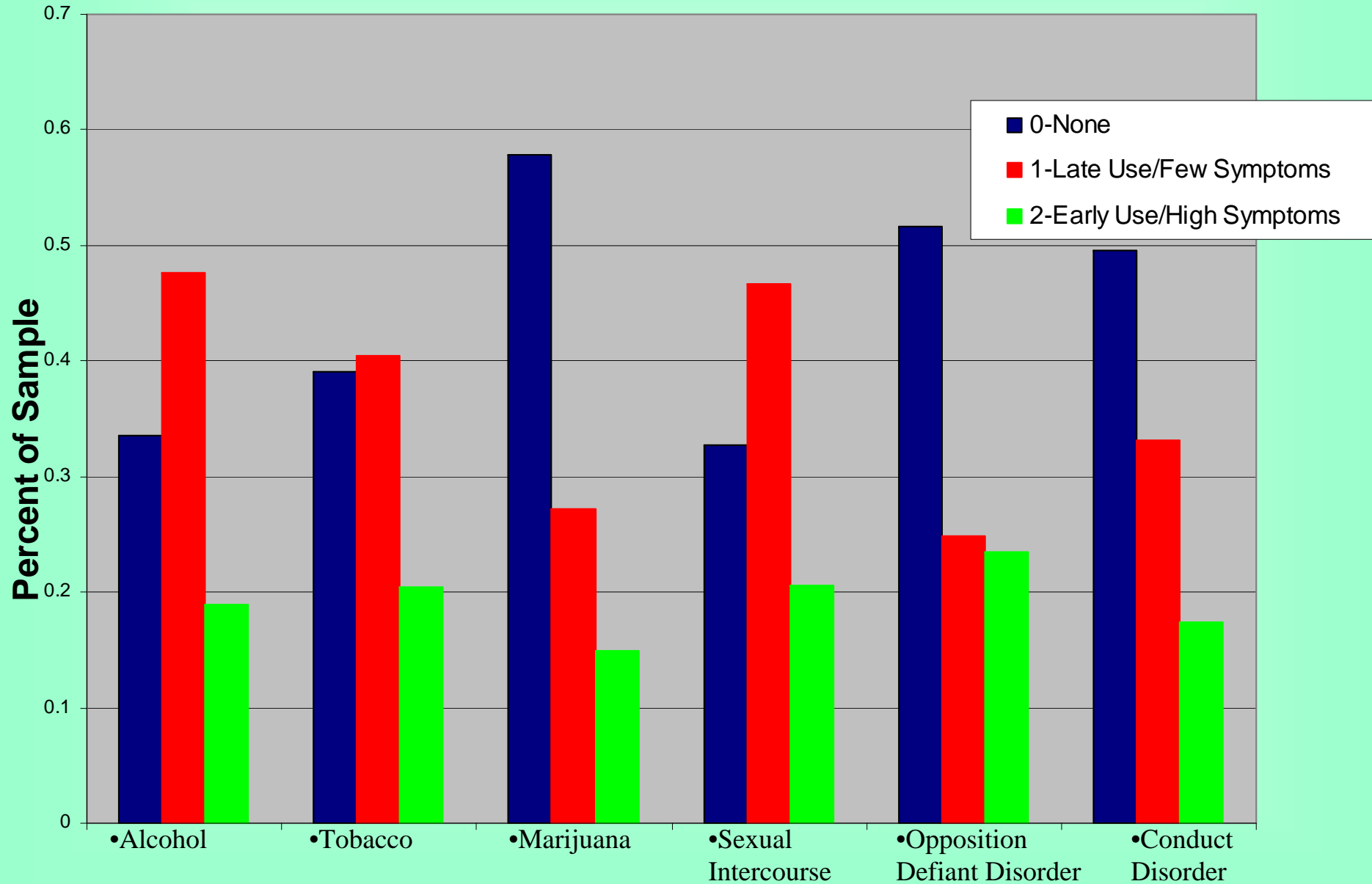
Early Use Criteria

Alcohol Use	14 or younger
Tobacco Use	12 or younger
Marijuana Use	15 or younger
Sexual Intercourse	14 or younger

- For Oppositional and Conduct variables, a symptom count was used instead of onset age
 - 0 = No Symptoms
 - 1 = At least one symptom and fewer than diagnostic criteria
 - 2 = Symptom count reached diagnostic criteria for the associated disorder

Prevalence of Behaviors

Total Sample Population Results (n=931)



Latent Class Determination

Number of Latent Classes	BIC	Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT)
2	10611.182	--
3	10357.018	0.0000
4	10378.327	0.2292
5	10416.66	0.0464

- 3 Class solution results in lowest BIC
- 3 Class solution is a better fit vs. 2 Class Solution in VLMR-LRT
- 4 Class solution is not a better fit vs. 3 Class Solution in VLMR-LRT

Latent Class Outcome

Endorsement Probabilities

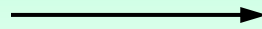
	None	Late/Few	Early/High
Alcohol Use	0.798	0.161	0.041
Tobacco Use	0.9	0.056	0.044
Marijuana Use	0.996	0.004	0
Intercourse	0.721	0.233	0.047
Oppositional	0.597	0.215	0.188
Conduct	0.661	0.289	0.05

	None	Late/Few	Early/High
Alcohol Use	0.073	0.826	0.1
Tobacco Use	0.152	0.733	0.115
Marijuana Use	0.454	0.52	0.027
Intercourse	0.144	0.781	0.076
Oppositional	0.586	0.246	0.168
Conduct	0.566	0.364	0.069

	None	Late/Few	Early/High
Alcohol Use	0.133	0.364	0.503
Tobacco Use	0.098	0.364	0.539
Marijuana Use	0.237	0.249	0.514
Intercourse	0.096	0.308	0.596
Oppositional	0.315	0.293	0.392
Conduct	0.184	0.335	0.481

- 931 Sample Total

- 298 (32.0%) – **“Zero Class”**

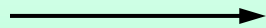


- 388 (41.7%) – **“Late/Few Class”**



- Normative Class

- 245 (26.3%) – **“Early/High Class”**



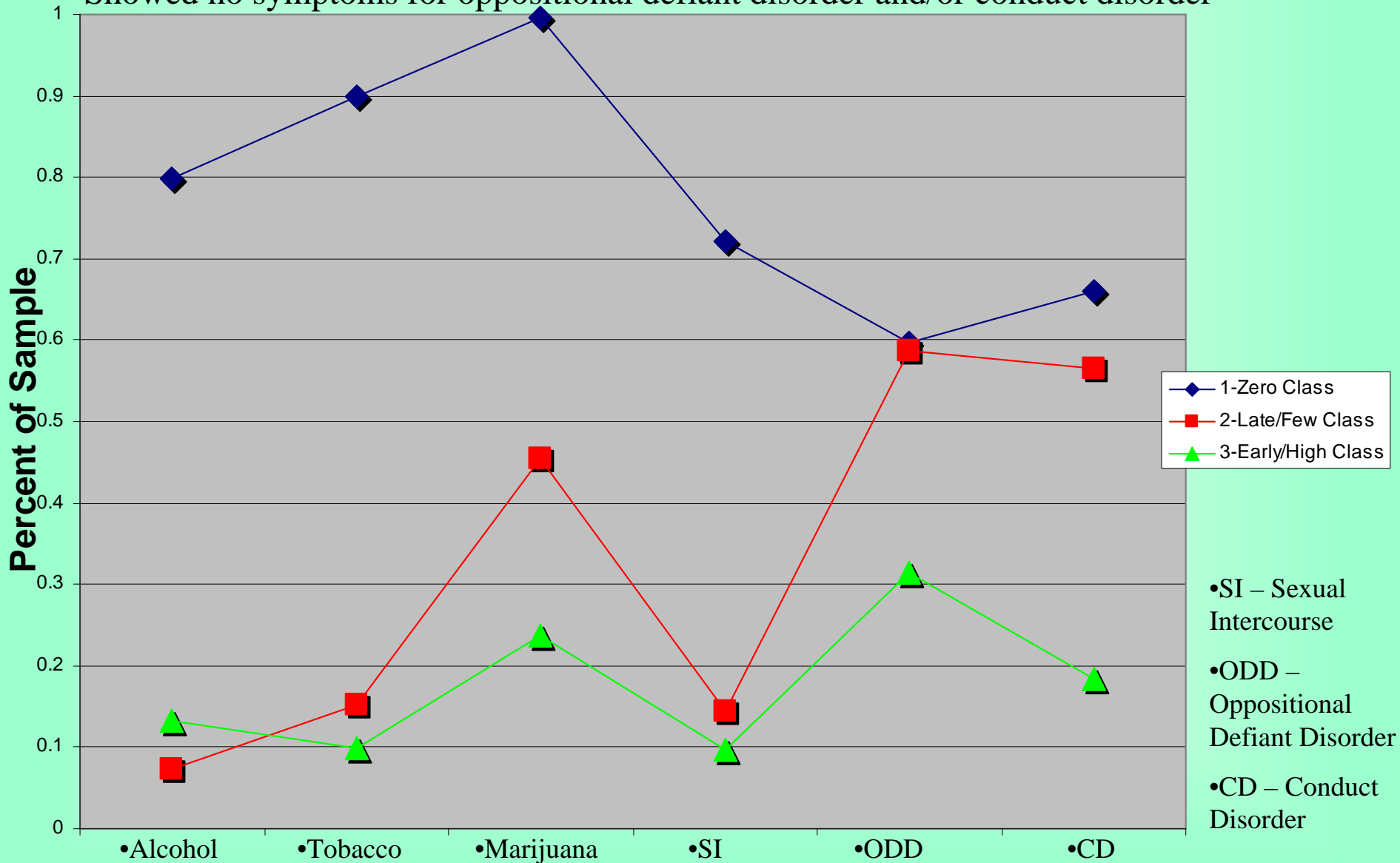
- High Risk Class

- Target of Analysis

None

•Did not use any substance or engage in sexual intercourse

•Showed no symptoms for oppositional defiant disorder and/or conduct disorder



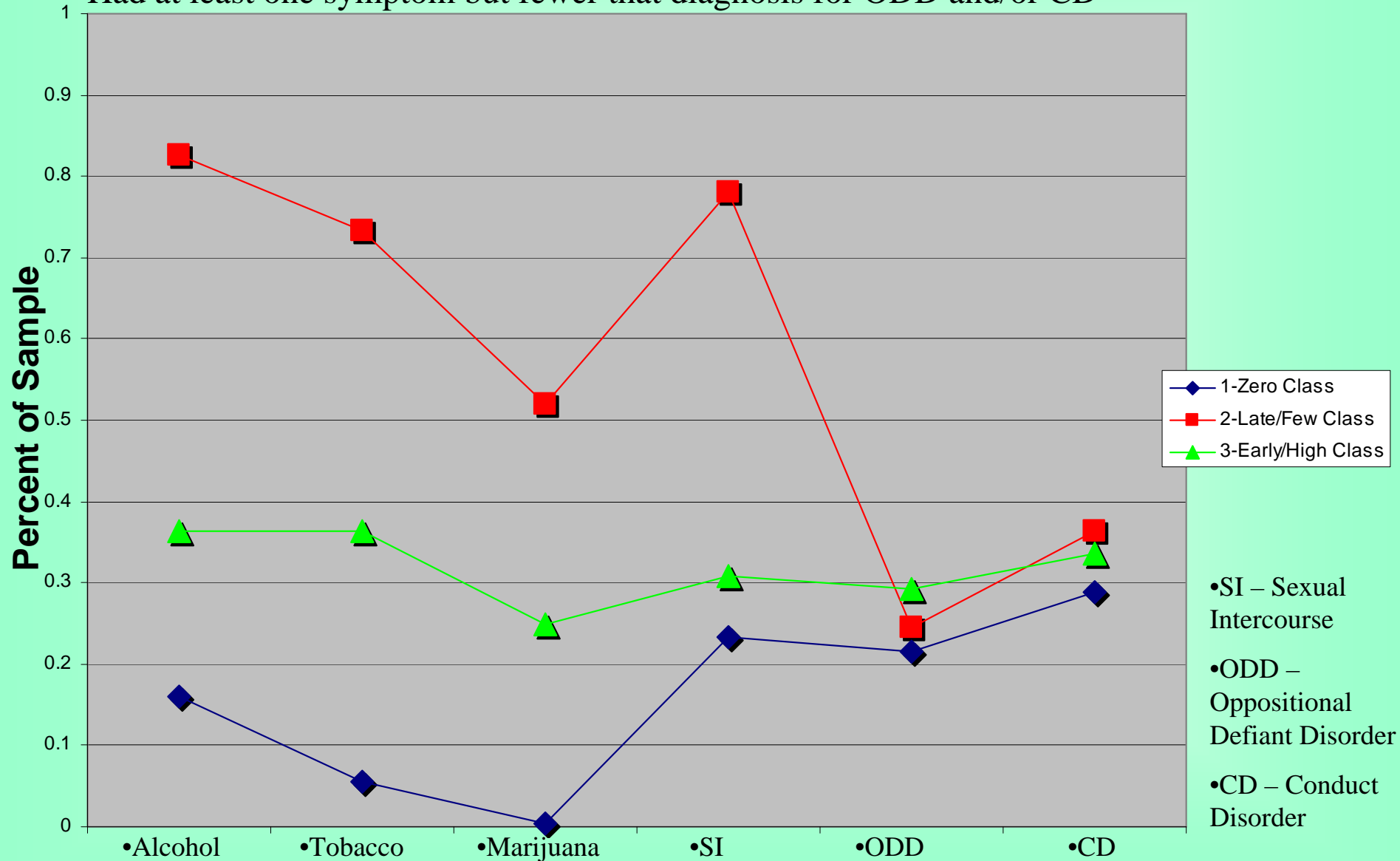
•SI – Sexual Intercourse

•ODD – Oppositional Defiant Disorder

•CD – Conduct Disorder

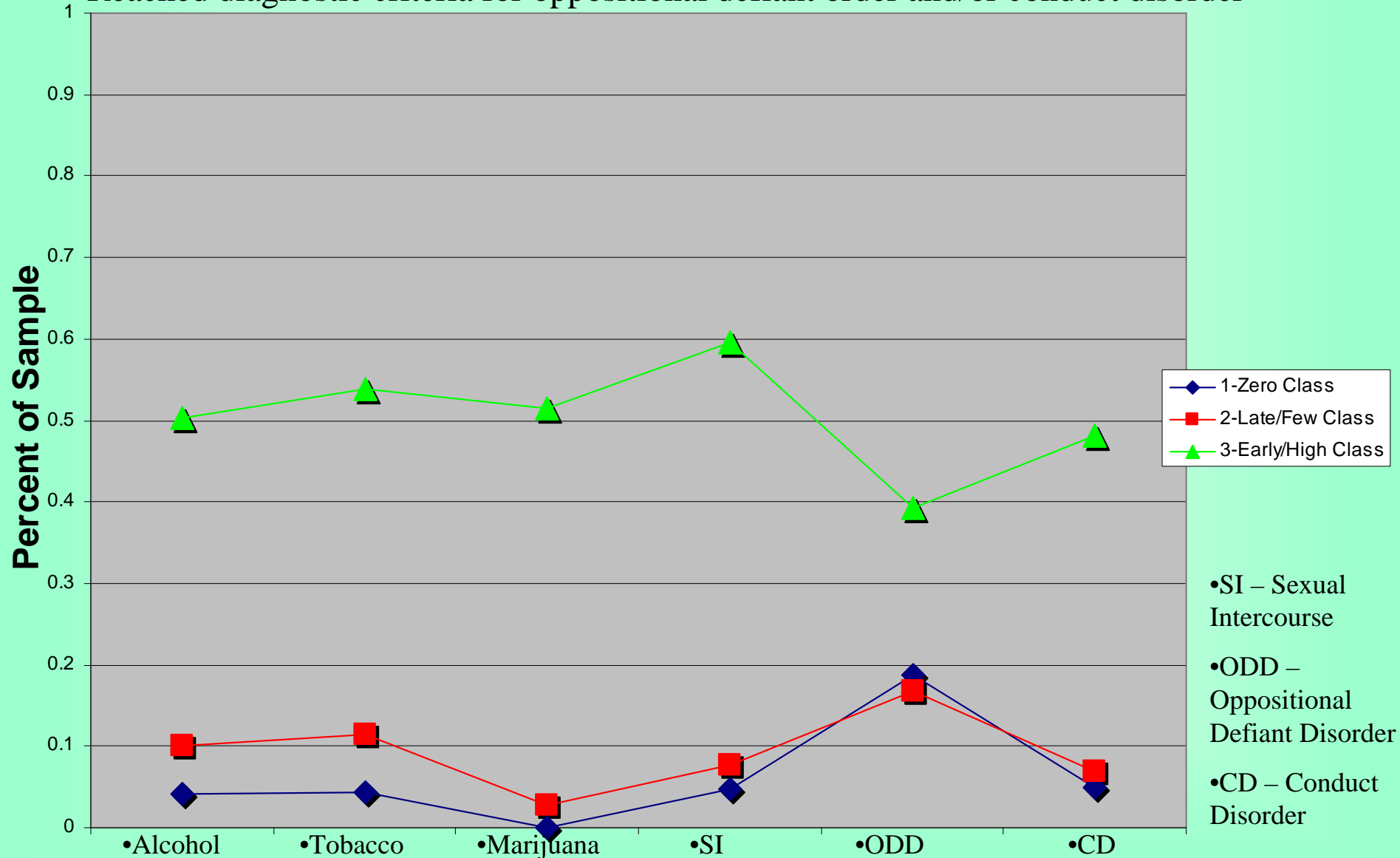
Late Use / Few Symptoms

- Used substances and/or engaged in sexual intercourse at a later age
- Had at least one symptom but fewer that diagnosis for ODD and/or CD



Early Use / High Symptoms

- Used substances and/or engaged in sexual intercourse at early age
- Reached diagnostic criteria for oppositional defiant order and/or conduct disorder



- SI – Sexual Intercourse
- ODD – Oppositional Defiant Disorder
- CD – Conduct Disorder

Logistic Regression Models

Modeling probability of latent class membership using the Late/Few Class as the comparison - Controlling For Age -

Early/High Class Vs Late/Few Class

	OR	95% CI
AA	1.89***	1.33 - 2.70
Male	1.72**	1.21 - 2.44
HR	1.91**	1.24 - 2.94
RDD	1.88**	1.24 - 2.86

Zero Class Vs Late/Few Class

	OR	95% CI
AA	1.2	0.82 - 1.74
Male	0.68*	0.49 - 0.96
HR	0.72	0.46 - 1.12
RDD	0.62*	0.40 - 0.97

Note: HR-High Risk Families, RDD-Recurrent Drunk Driving Families, AA-African American, EA-European American

+ Odds Ratios have a P value <0.1

* Odds Ratios have a P value <0.05

** Odds Ratios have a P value <0.01

*** Odds Ratios have a P value <0.001

Logistic Regression Models by Ethnicity

Modeling probability of latent class membership using the Late/Few Class as the comparison - Controlling For Age -

European Americans

Early/High Class Vs Late/Few Class

	OR	95% CI
Male	1.02	0.58 - 1.79
HR	4.40**	1.74 - 10.95
RDD	4.34**	1.88 - 10.01

Zero Class Vs Late/Few Class

	OR	95% CI
Male	0.62*	0.34 - 0.98
HR	0.67	0.32 - 1.38
RDD	0.6	0.32 - 1.14

African Americans

Early/High Class Vs Late/Few Class

	OR	95% CI
Male	2.78***	1.78 - 4.34
HR	1.5	0.88 - 2.54
RDD	1.15	0.64 - 2.06

Zero Class Vs Late/Few Class

	OR	95% CI
Male	0.79	0.52 - 1.22
HR	0.78	0.45 - 1.37
RDD	0.68	0.38 - 1.21

Note: HR-High Risk Families, RDD-Recurrent Drunk Driving Families, AA-African American, EA-European American

+ Odds Ratios have a P value <0.1

* Odds Ratios have a P value <0.05

** Odds Ratios have a P value <0.01

*** Odds Ratios have a P value <0.001

Substance Abuse/Dependence and Depression Risk

Logistic Regression Models – Modeling probability of Substance Dependence or Depression for each Latent Class using the Late Use Latent Class as the comparison - Controlling For Age, Race, Gender, HR Families, and RDD Families -

Early/High Class Vs Late/Few Class

	OR	95% CI
Alcohol Abuse/Dep	2.89***	1.89 - 4.42
Tobacco Dependence	3.01***	1.81 - 5.01
Marijuana Abuse/Dep	2.23*	1.18 - 4.19
Depression	1.87*	1.06 - 3.29

European Americans

	OR	95% CI
Alcohol Abuse/Dep	4.62***	2.39 - 8.96
Tobacco Dependence	4.00***	2.05 - 7.79
Marijuana Abuse/Dep	1.58	0.59 - 4.21
Depression	1.35	0.58 - 3.17

African Americans

	OR	95% CI
Alcohol Abuse/Dep	2.25**	1.22 - 4.15
Tobacco Dependence	2.3 ⁺	0.94 - 5.63
Marijuana Abuse/Dep	3.12*	1.12 - 8.64
Depression	2.14 ⁺	0.99 - 4.60

Zero Class Vs Late/Few Class

	OR	95% CI
Depression	0.98	0.48 - 1.99

European Americans

	OR	95% CI
Depression	0.84	0.30 - 2.36

African Americans

	OR	95% CI
Depression	0.99	0.38 - 2.58

Note: HR-High Risk Families, RDD-Recurrent Drunk Driving Families, AA-African American, EA-European American

+ Odds Ratios have a P value <0.1

* Odds Ratios have a P value <0.05

** Odds Ratios have a P value <0.01

*** Odds Ratios have a P value <0.001

Comments

- Subjects are at **higher risk** to fall within the **Early/High latent class** when the subject is:
 - Male
 - African American
 - From a High Risk family or Recurrent Drunk Driving Family
- Subjects were **more likely** to be placed in the **Zero latent class** when the subject is:
 - Female
 - From a Low Risk or High Risk Family
- Subjects among the **Early/High class** are at **higher risk** compared to Late/Few class to have:
 - Alcohol Dependence or Abuse
 - Tobacco Dependence
 - Marijuana Dependence or Abuse
 - Depression
- **European Americans** within the **Early/High class** compared to Late/Few class are at **higher risk** for:
 - Alcohol Dependence or Abuse
 - Tobacco Dependence
- **African Americans** within the **Early/High class** compared to Late/Few class are at **higher risk** for:
 - Alcohol Dependence or Abuse
 - Marijuana Dependence or Abuse
- Our data suggest a class reflecting general early use of all substances, but not early use of a particular substance
- Level of conduct disorder and oppositional defiant disorder symptoms did not differentiate the **Zero** class from the **Late/Few** class