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The Relationship between GABRA 2 and Illicit Substance Use

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Introduction

- Spit for Science: the VCU Student Survey aims to understand how genetic and environmental factors come together to influence substance use and emotional health.
- Previous research has shown that *GABRA2* is associated with alcohol use problems and illicit drug dependence.^[1,2]
- It is therefore of great interest to find out whether variations in *GABRA2* are associated with illicit drug use in this sample.
- We also tested for moderation of the association between *GABRA2* and illicit drug use as a function of peer deviance.
- It is hypothesized that *GABRA2* will be associated with illicit substance use and that individuals with high risk genotypes and more deviant peers will have increased illicit drug use.

Methods

- In the fall of 2011, incoming VCU freshman were invited to take the Spit for Science survey and also provide a saliva sample.
- Survey responses regarding substance used were combined into a sum score based on how many different categories of illicit drugs the student reported trying at least once. The five categories were marijuana, opioids, cocaine, stimulants, and sedatives.
- Survey response regarding peer deviance in college were also combined into a sum score. Deviant behaviors included smoking marijuana, having any alcoholic drinks, having problems with alcohol, smoking cigarettes, and problems with the law. Response options ranged from “none” up to “all.”
- DNA samples were genotyped on the Axiom Biobank Array.
- We investigated eight single nucleotide polymorphisms (SNPs) in *GABRA2*.
- Linear regression (n=786) was used to test for association and moderation. Covariates included age, sex and ethnicity.

Results

Figure 1. Diagram of investigated SNPs in the *GABRA2* gene

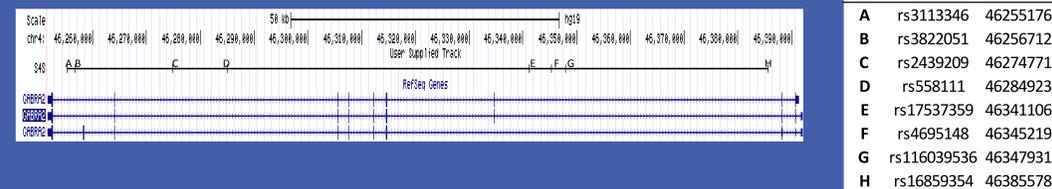


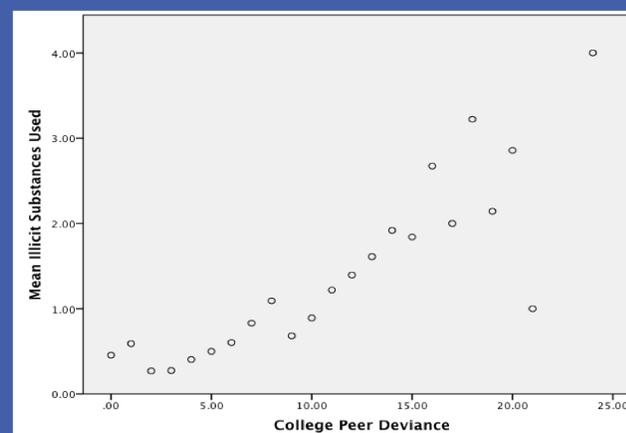
Figure 2. Mean Number of Illicit substances used by genotype

SNP	0 copies of minor allele (N)	1 copy of minor allele (N)	2 copies of minor allele (N)
rs3113346	1.282 (401)	1.131 (734)	1.042 (381)
rs3822051	1.137 (977)	1.199 (477)	0.939 (66)
rs2439209	1.089 (576)	1.160 (687)	1.237 (228)
rs558111	1.275 (396)	1.138 (727)	1.033 (393)
rs17537359	1.124 (1375)	1.341 (135)	1.6 (5)
rs4695148	1.120 (1247)	1.274 (252)	1.467 (15)
rs116039536	1.156 (1414)	0.960 (101)	1.143 (7)
rs16859354	1.2 (725)	0.967 (734)	1.025 (158)

- ❖ There was no significant association between *GABRA2* genotype and illicit drug use
- ❖ Peer deviance did not moderate the association between *GABRA2* and drug use.

Figure 4. Association between College Peer Deviance and Illicit Substance Use

As college peer deviance increases, so too does the illicit substance sum score.



Conclusions

- There was no significant association between *GABRA2* genotype and illicit drug use.
- Peer deviance did not moderate the association between *GABRA2* and illicit drug use.
- There was a positive association between peer deviance and illicit substance use.
- Limitations included that our sample only included college students. Previous studies found significant results in younger and older individuals.
- Future studies could examine the relationship between *GABRA2* and drug dependence or frequency of drug use.
- This study is one of the first to examine this relationship in college-aged students transitioning into adulthood.

References

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