

# Genetic Influences on the Association Between Perceived Parental Relationships and Substance Use in Adolescents

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## Background

- Pathological substance use and dependence often emerges during teenage years <sup>1</sup>
- Protective and risk factors for substance use include both genetic and environmental components
- Parental relationships can affect the development of internalizing or externalizing behavioral problems, specifically substance use <sup>2</sup>
- Parental warmth, monitoring or support versus parental criticism and antagonism <sup>3,4</sup>
- Lack of research combining genetics and environment; use of twin design

## Hypotheses

1. There would be a significant association between substance use and perceived parental relationships in adolescents
2. Shared genetic factors would influence the relationship between perception of parental relationships and substance use in adolescents.

## Methods

### Measures

- Zygosity (MZ or DZ)
- Substance Use
  - square root transformation for total score ranging from 0 to 3.50
- Perception of parental relationships
  - PBI: 25 question Likert scale (1-4)
  - mother and father figures

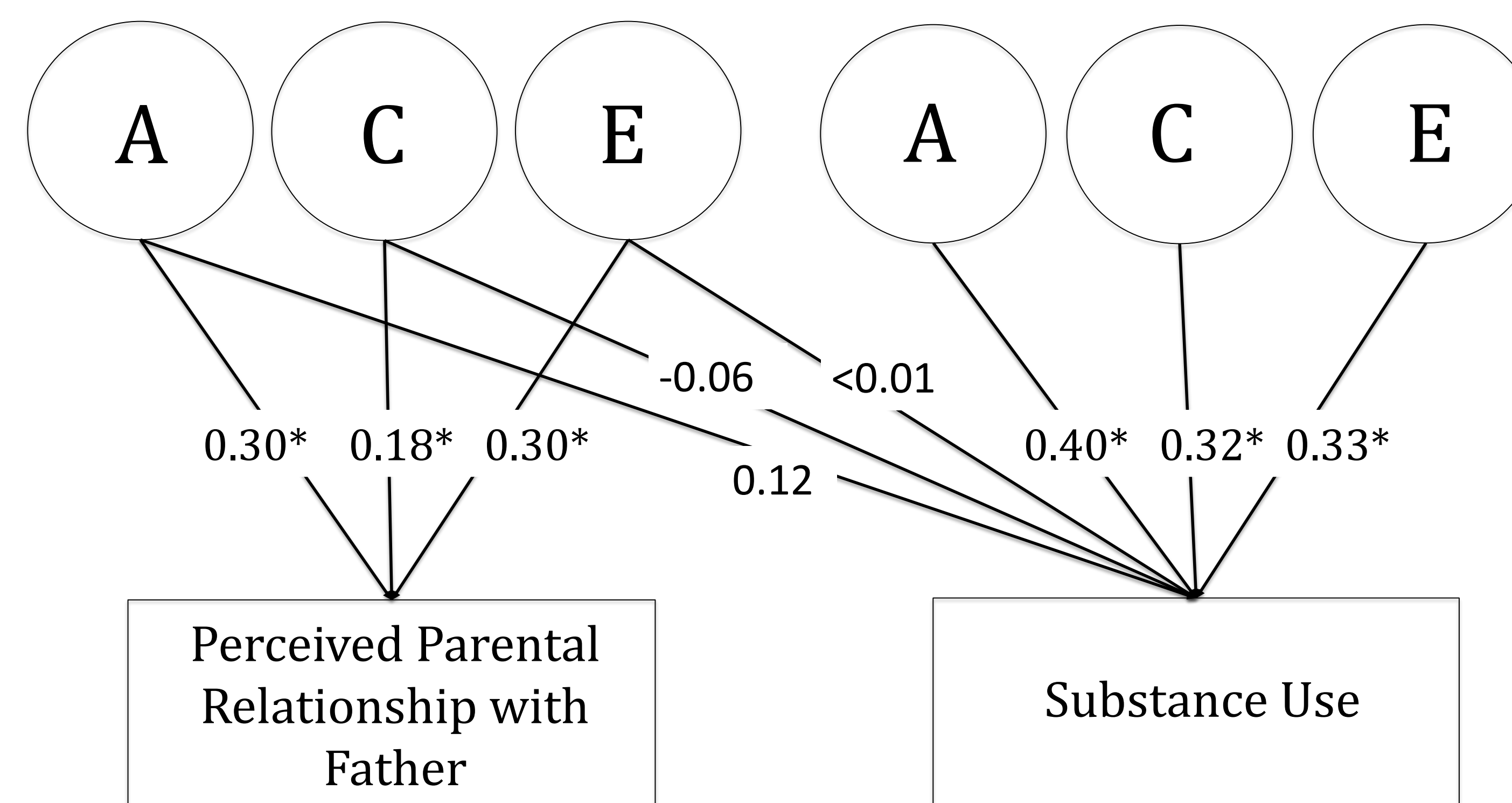
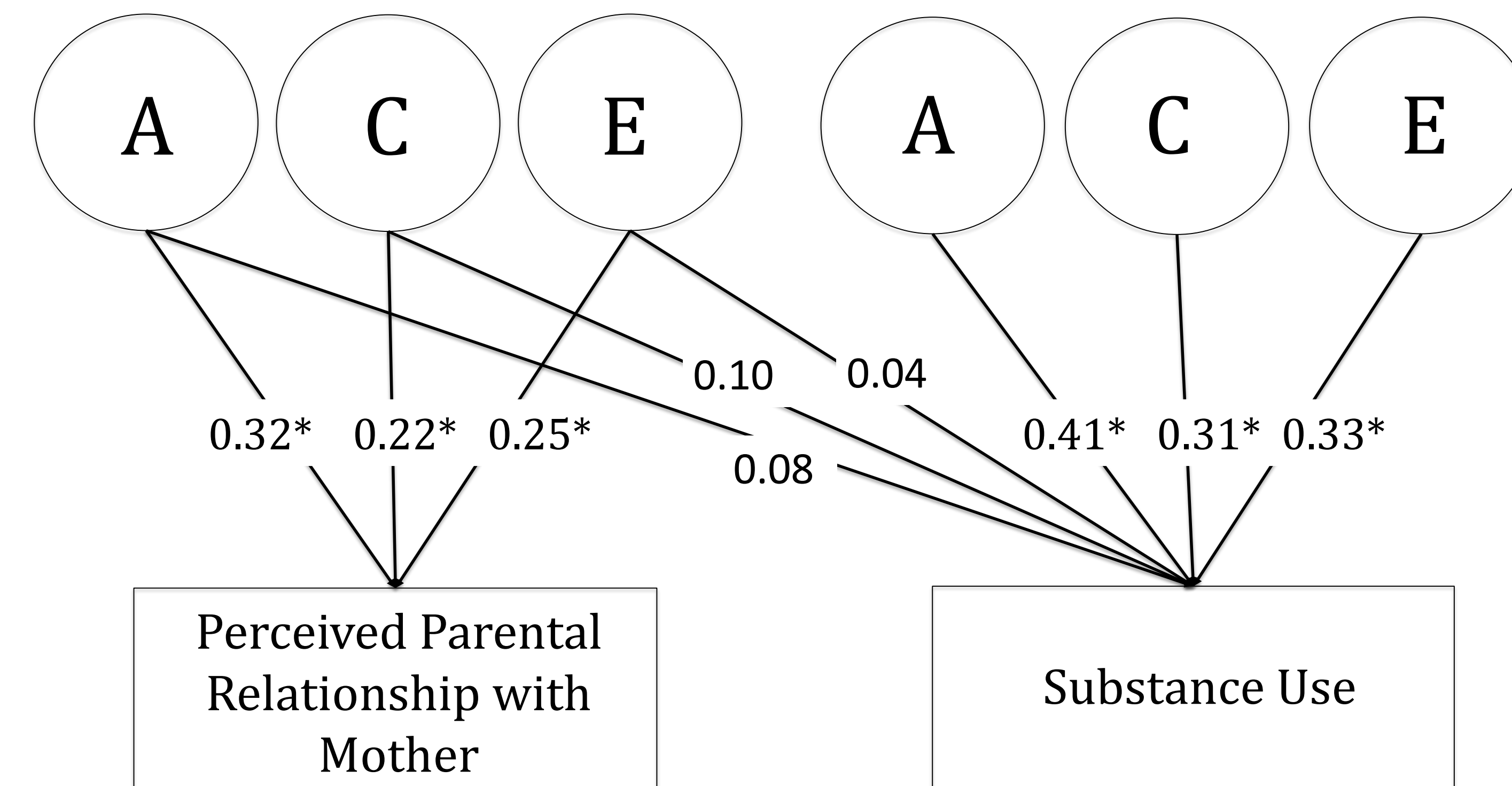
### Participants

- 826 MZ and DZ twins (ages 13-18)

### Procedure

- Twins found through public Texas school records and recruited
- Online, self-report questionnaire, which includes all three measures

## Bivariate Twin Models



A = additive genetic influences  
C = shared environmental influences  
E = non-shared environmental influences

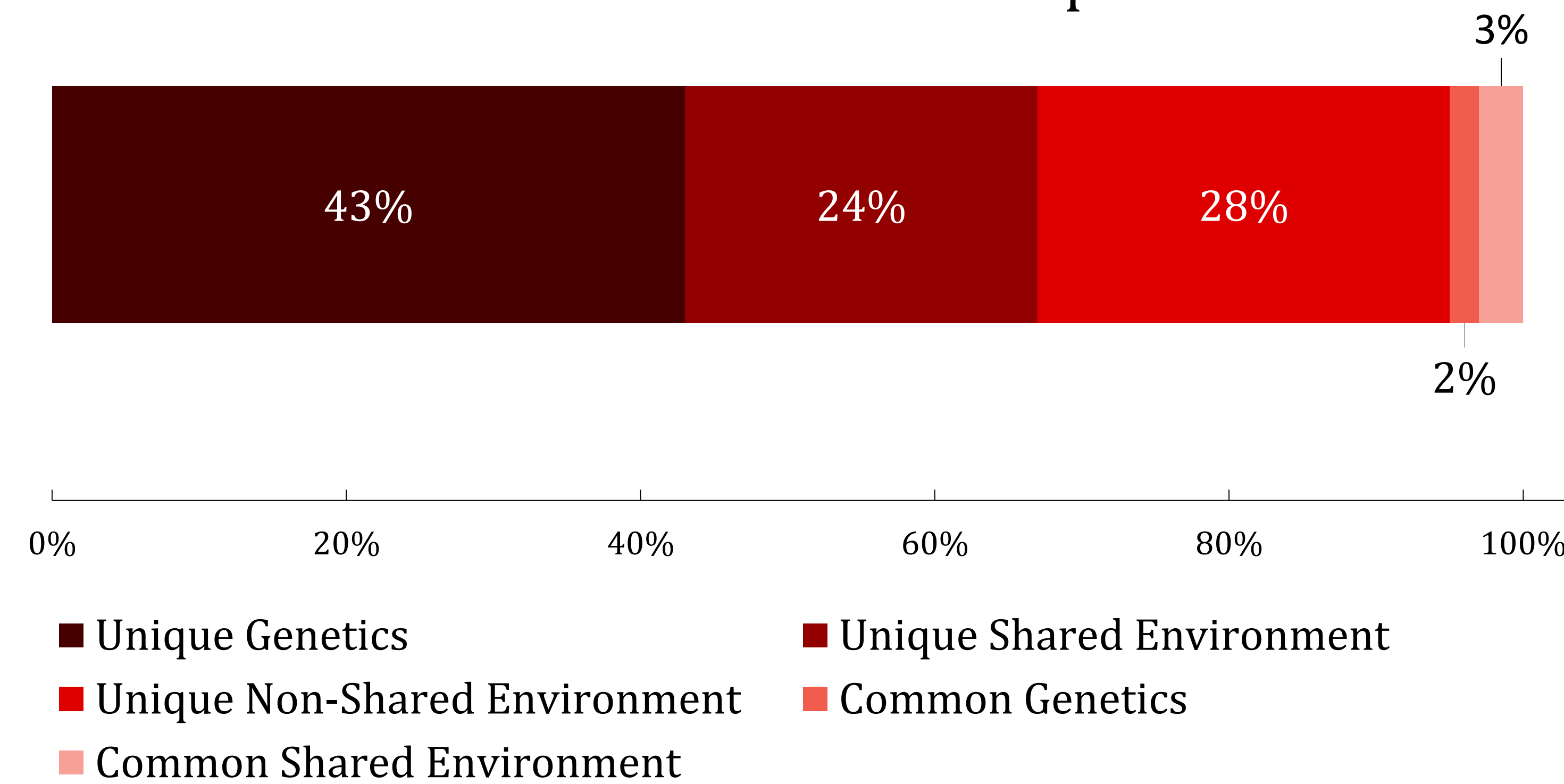
Note: \* indicates  $p < 0.05$

## Univariate Results

- **Sex effect:** females reported closer bonding with fathers than males did ( $r = -0.43, p < 0.05$ )
- **Sex by age interaction:** as age increases, females more likely than males to try more substances ( $r = 0.11, p < 0.05$ )

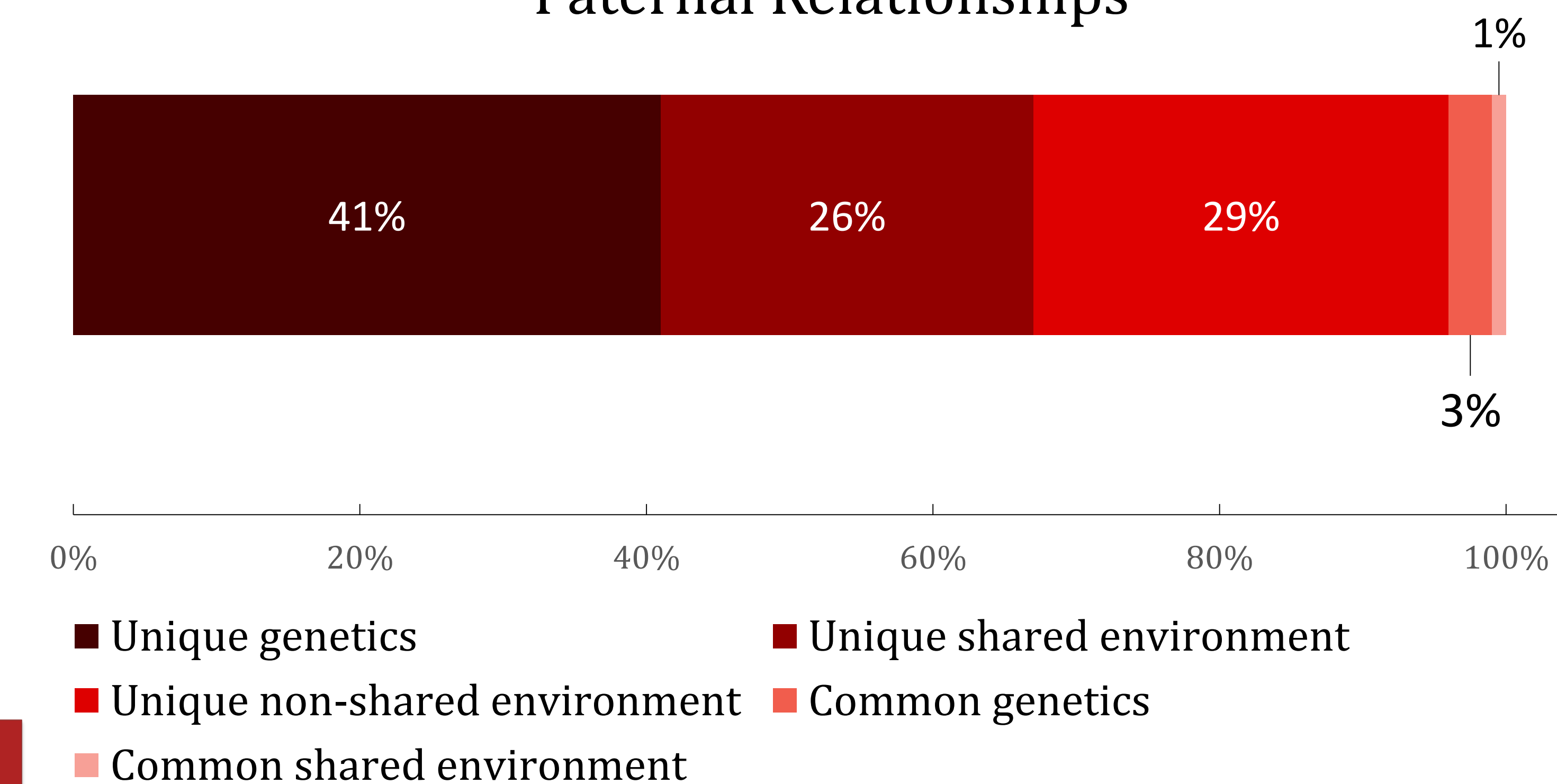
## Substance Use Variance Explained

### Maternal Relationships



- 43% of the variance in substance use is attributable to unique genetic factors
- 2% of genetic variance is shared between perceived maternal relationships and substance use

### Paternal Relationships



- 41% of the variance in substance use is attributable to unique genetic factors
- 3% of genetic variance is shared between perceived maternal relationships and substance use

## Summary

- Significant relationship between substance use and perception of both mother ( $r = 0.12$ ) and father ( $r = 0.08$ ) relationships;  $p < 0.05$
- Sex influenced paternal bonding
- Sex and age influenced substance use
- Majority of the variation in substance use alone is due to unique genetic factors
- 2-3% of the variation in substance use due to perceived relationships with parents is attributable to common genetic factors

## Conclusion

- Scoring of substance use was a limitation
- Future studies should examine sex effects on this relationship
- Perceived relationships with parents may be more influenced by genetic predispositions rather than environmental factors

## References

- <sup>1</sup>Substance Abuse and Mental Health Services Administration (2003). Treatment Episode Data Set (TEDS): Highlights—2003. National Admissions to Substance Abuse Treatment Services, Rockville, MD: Department of Health and Human Services, 2003.
- <sup>2</sup>Stogner, J. M., & Gibson, C. L. (2016). Genetic modification of the relationship between parental rejection and adolescent alcohol use. *Alcohol And Alcoholism*, 51(4), 442-449. doi:10.1093/alcalc/agv136
- <sup>3</sup>Abar, C. C., Fernandez, A. C., & Wood, M. D. (2011). Parent-Teen Communication and Pre-College Alcohol Involvement: A Latent Class Analysis. *Addictive Behaviors*, 36(12), 1357-1360. <http://doi.org/10.1016/j.addbeh.2011.07.044>
- <sup>4</sup>Su, J., Supple, A. J., & Kuo, S. I.-C. (2017). The role of individual and contextual factors in differentiating substance use profiles among adolescents. *Substance Use & Misuse*, 1-10. <https://doi.org/10.1080/10826084.2017.1363237>

## Acknowledgements

Special thanks to my graduate student Aditi Sabhlok who helped me greatly with this study, as well as the Risky Business Lab.