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Evidence of Neighborhood Influences on Early Adolescent Alcohol Use and Related Behavior Problems

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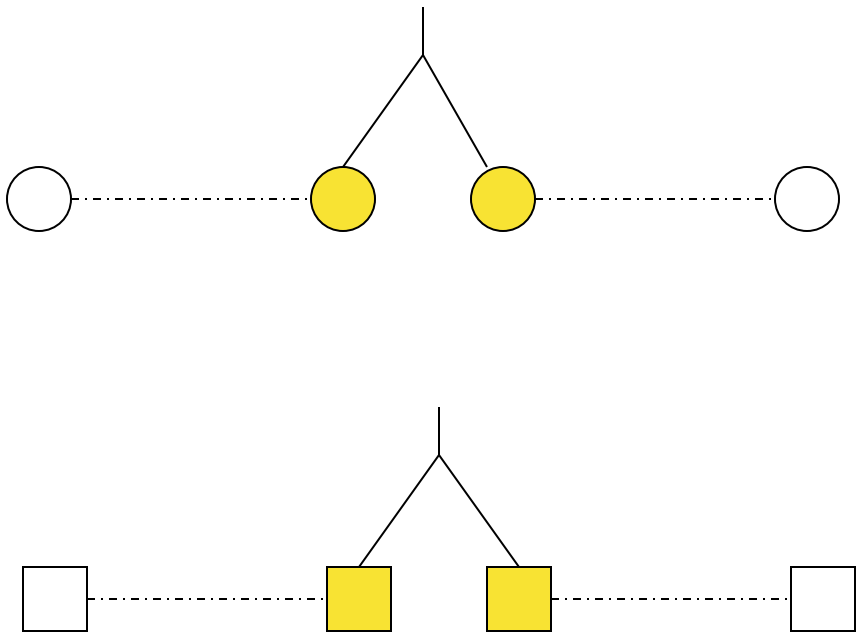
Introduction

- Neighborhood influences have direct and indirect influences on many adolescent outcomes, but much of existing research on neighborhood influences has not accounted for genetic variation on the development of behavioral differences, rather, studies of each of these important sources of influence have been conducted largely in isolation

- Traditional twin design provides information about genetic and “common environmental” influence, but is unable to differentiate familial and extrafamilial environmental influences

- By studying classmate controls in addition to twins, we can compare correlations between twins and between controls to identify genetic, familial environmental, and extrafamilial environmental influences on outcome

CLASSMATE CONTROLS OF TWINS



~935 dyads

Controls

Genetic strangers reared in different households

Matched to twin on:

Gender
Birth cohort
Neighborhood
School
Class

Methods

- Monozygotic (MZ) twins share 100% genetic variation, 100% common environment (includes family, neighborhood/school)
- Dizygotic (DZ) twins share 50% genetic variation, 100% common environment (includes family, neighborhood/school)
- Controls share no genetic variation, no family environment
  DO share neighborhood, school
- Comparisons of MZ/DZ twins yield information about genetic influence, common environment (family and neighborhood/school); control correlation yields information about extent to which neighborhood/school influences outcome

FinnTwin12 Sample

- Population based sample of adolescent twins and gender- and age-matched classmate controls in Finland born between 1983 and 1987

- Alcohol outcome data collected by self-report at age 12
  - 918-926 twin pairs (333-337 MZ pairs and 296-299 DZ pairs) and 921-930 control pairs

- Behavior problem outcome data provided by teacher rating of age 12 twins and controls
  - 2267 twin pairs (703 MZ pairs and 1399 DZ pairs) and 2218-2220 control pairs

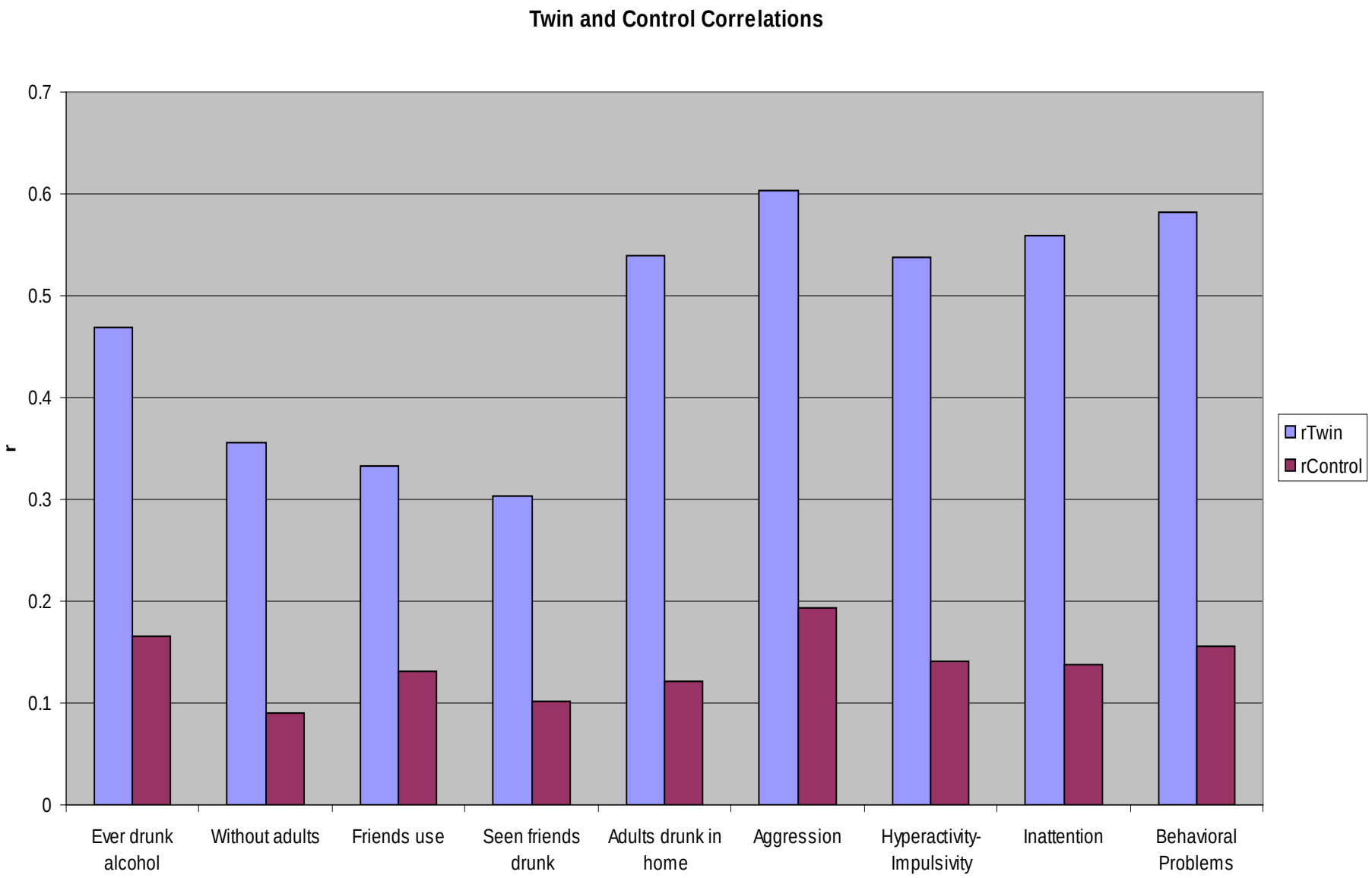
Alcohol Outcomes

- Have you ever drunk alcohol? (Ever drunk alcohol)
- Have you ever drunk alcohol with your friends without adults around? (Without adults)
- Do you have any friends who use alcohol? (Friends use)
- Have you ever seen any of your friends drunk? (Seen friends drunk)
- Have you ever seen adults drunk at your own home? (Adults drunk in home)

Behavior Problem Outcomes

- Teacher ratings on Multidimensional Peer Nomination Inventory (Pulkkinen, Kaprio, & Rose, 1999)
  - Aggression
  - Impulsivity-Hyperactivity
  - Inattention
  - Behavior Problems

Evidence for Extrafamilial Environmental Influence



Twin and Control Correlations

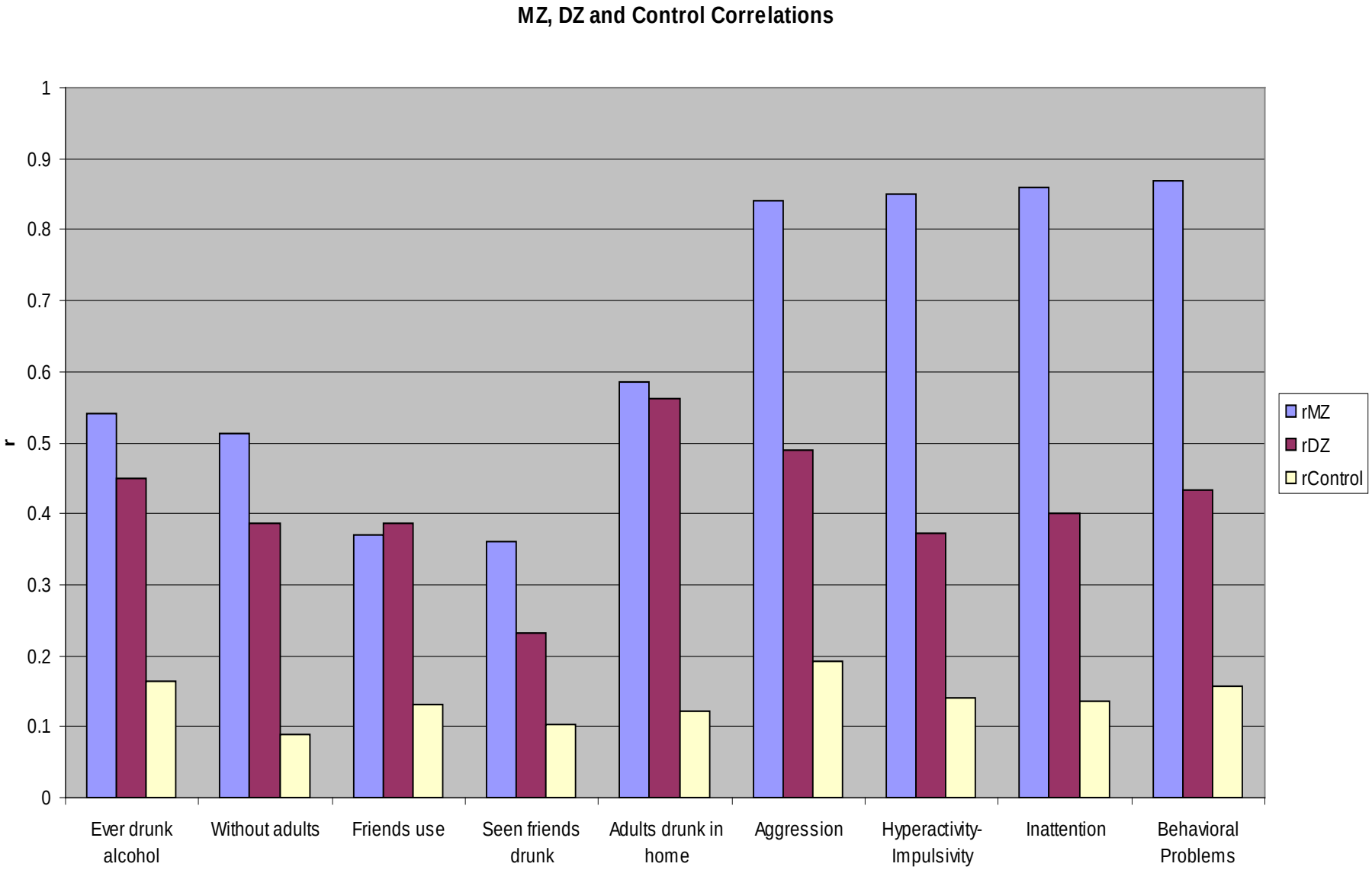
	rTwin	rControl
Ever drunk alcohol	.469**	.165**
Without adults	.356**	.090**
Friends use	.333**	.131**
Seen friends drunk	.304**	.102**
Adults drunk in home	.540**	.122**
Aggression	.603**	.193**
Hyperactivity-Impulsivity	.538**	.141**
Inattention	.559**	.137**
Behavioral problems	.582**	.156**

**p<.01

Extrafamilial Environmental Influence

- Controls were significantly correlated for each of the alcohol and behavior problem outcomes
- Correlations between classmate control dyads reflect extrafamilial environmental influences (e.g., neighborhood, school, peers) as they share neither genes nor family environments
- Therefore, results suggest that extrafamilial environments do influence alcohol use and related behavior outcomes among adolescents

Evidence for Genetic Influence



MZ, DZ and Control Correlations

	rMZ	rDZ	rControl
Ever drunk alcohol	.542**	.449**	.165**
Without adults	.514**	.386**	.090**
Friends use	.369**	.386**	.131**
Seen friends drunk	.361**	.233**	.102**
Adults drunk in home	.586**	.561**	.122**
Aggression	.840**	.490**	.193**
Hyperactivity-Impulsivity	.849**	.373**	.141**
Inattention	.860**	.400**	.137**
Behavioral Problems	.869**	.433**	.156**

**p<.01

Genetic Influence

- Correlations between MZ twins were greater than those between DZ twins for four out of the five alcohol outcomes and each of the behavior outcomes, suggesting genetic influence for these four alcohol outcomes and all of the behavior outcomes

- There is much greater evidence for genetic influence on behavior outcomes than alcohol outcomes at this age, as indicated by bigger MZ-DZ differences in correlation

Conclusions

- Adolescent alcohol use and related behavior problems are influenced by several factors, including genetic and extrafamilial environments

- Further research is needed to (1) examine the specific variables within neighborhood environments that influence these outcomes and (2) elucidate the mechanisms through which these neighborhood variables exert influence

Acknowledgements

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