

Behavioral Genetics and the Origins of Individual Differences in Behavior

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Rise of Genetic Determinism

“... grade of intelligence or mental level for each individual is determined by the kind of chromosomes that come together with the union of the germ cells ... [and] is but **little affected by any later influence** ...”

Henry Herbert Goddard (1920)



Radical Behaviorism



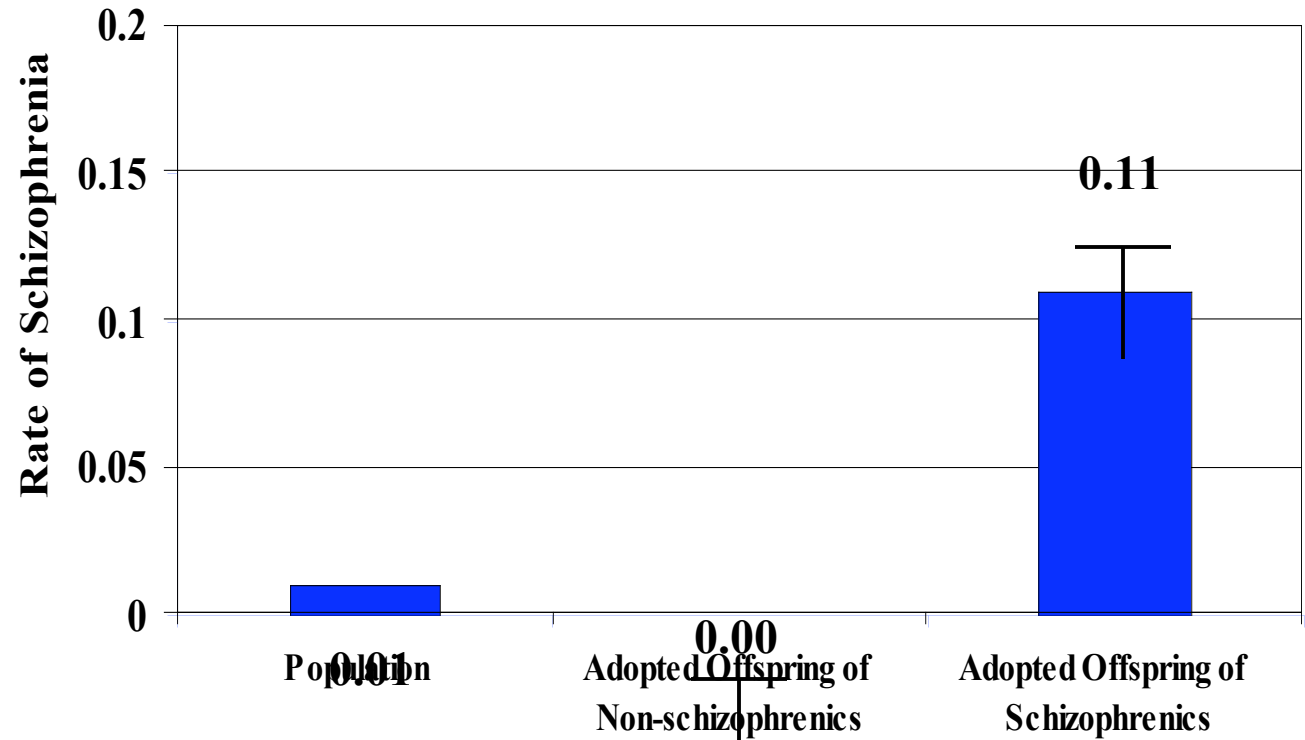
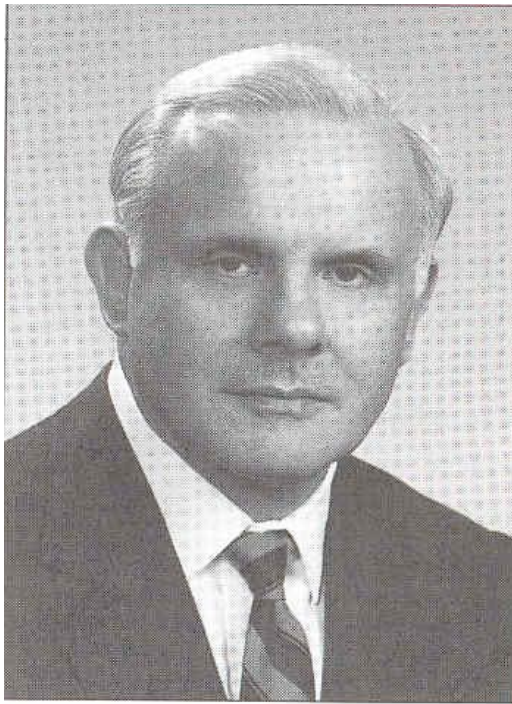
“Give me a dozen healthy infants well-formed, and my own specified world to bring them up in and I’ll guarantee to **take any one at random and train him to become any type of specialist I might select** -- a doctor, lawyer, artist, merchant-chief, and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestor.”

John B. Watson (1924)

Genetics is Important

- **Adoption Studies** → an adopted child resembles his/her birth parents

First Adoption Study of Schizophrenia

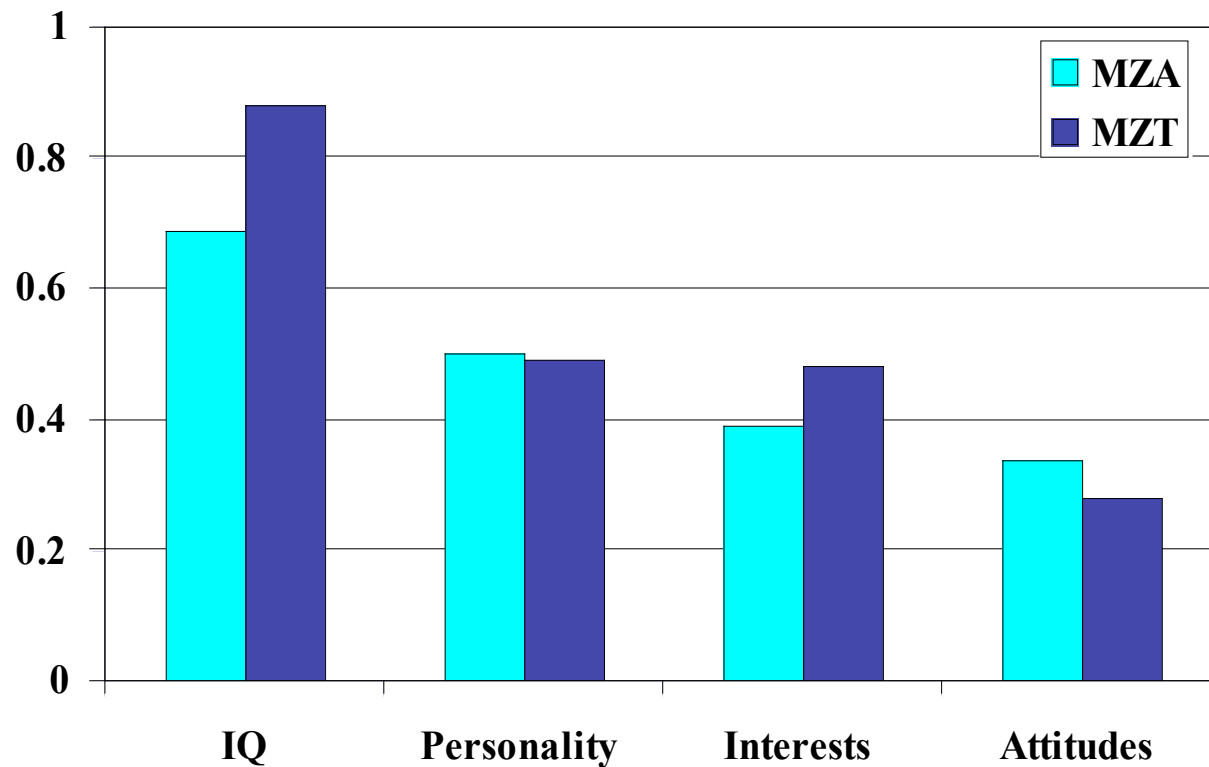


Heston, L.L. (1966). *British Journal of Psychiatry*, 112: 819-825

Genetics is Important

- Adoption Studies → an adopted child resembles his/her birth parents
- Reared-Apart Twin Studies → MZ twins who were reared apart show significant behavioral similarity

Reared-apart (MZA) and Reared-together (MZT) Twin Similarity

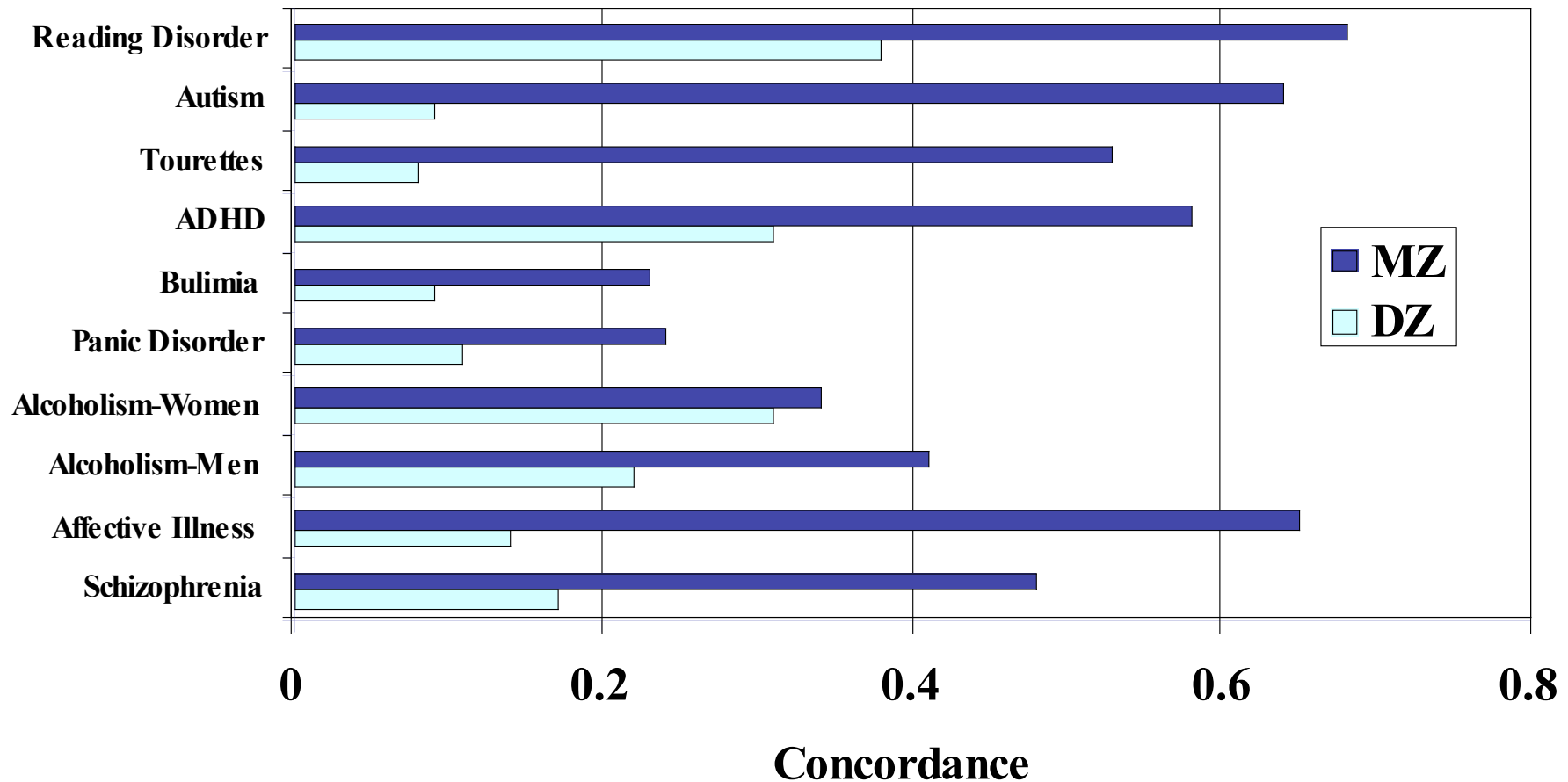


Bouchard et al. (1990). *Science*, 250: 223-228.

Genetics is Important

- Adoption Studies → an adopted child resembles his/her birth parents
- Reared-Apart Twin Studies → MZ twins who were reared apart show significant behavioral similarity
- **Reared-Together Twin Studies** → **MZ twins are consistently more similar than DZ twins**

Reared-together Twin Concordance for Behavioral Disorders



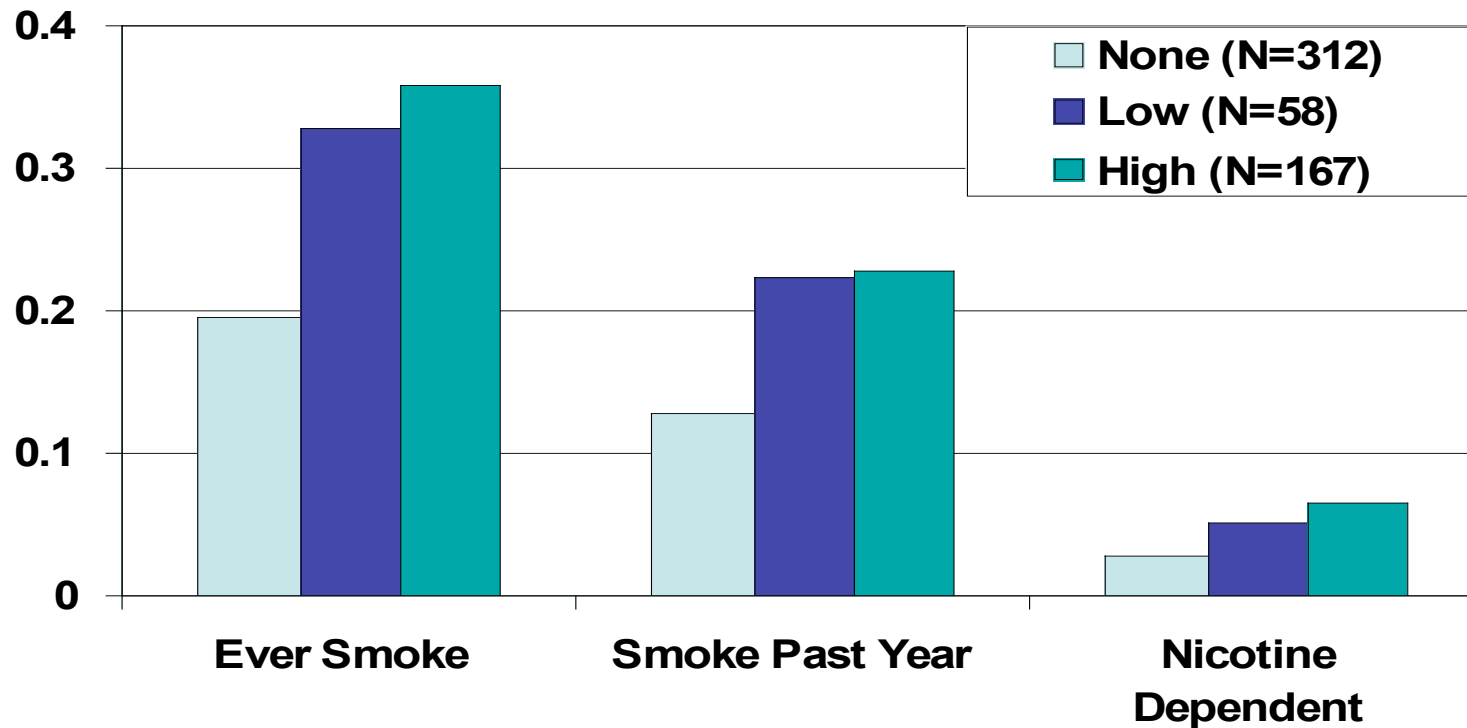
McGue & Bouchard (1997). *Annual Review of Neuroscience*, 21: 1-24

Adolescent Smoking

- **Common:** ~60% of adolescents try smoking
- **Significant:** Nearly all nicotine dependent adults started as youth
- **Familial:**



Exposure to Parent Smoking and Smoking Behavior in 537 Adolescents

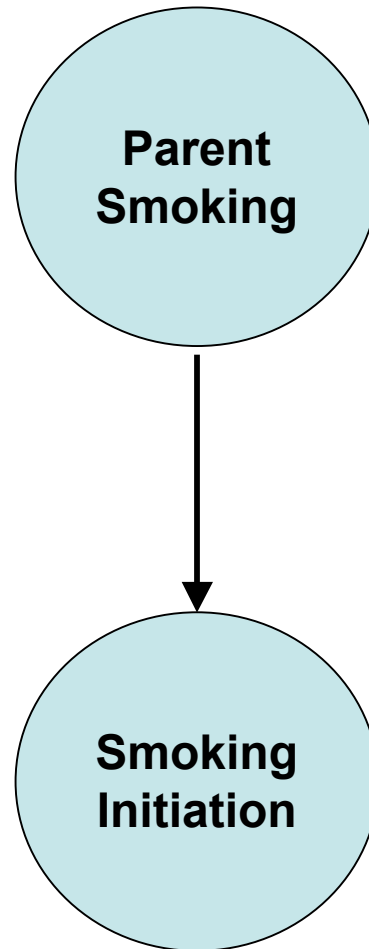


(p < .001)

(p = .01)

(p = .15)

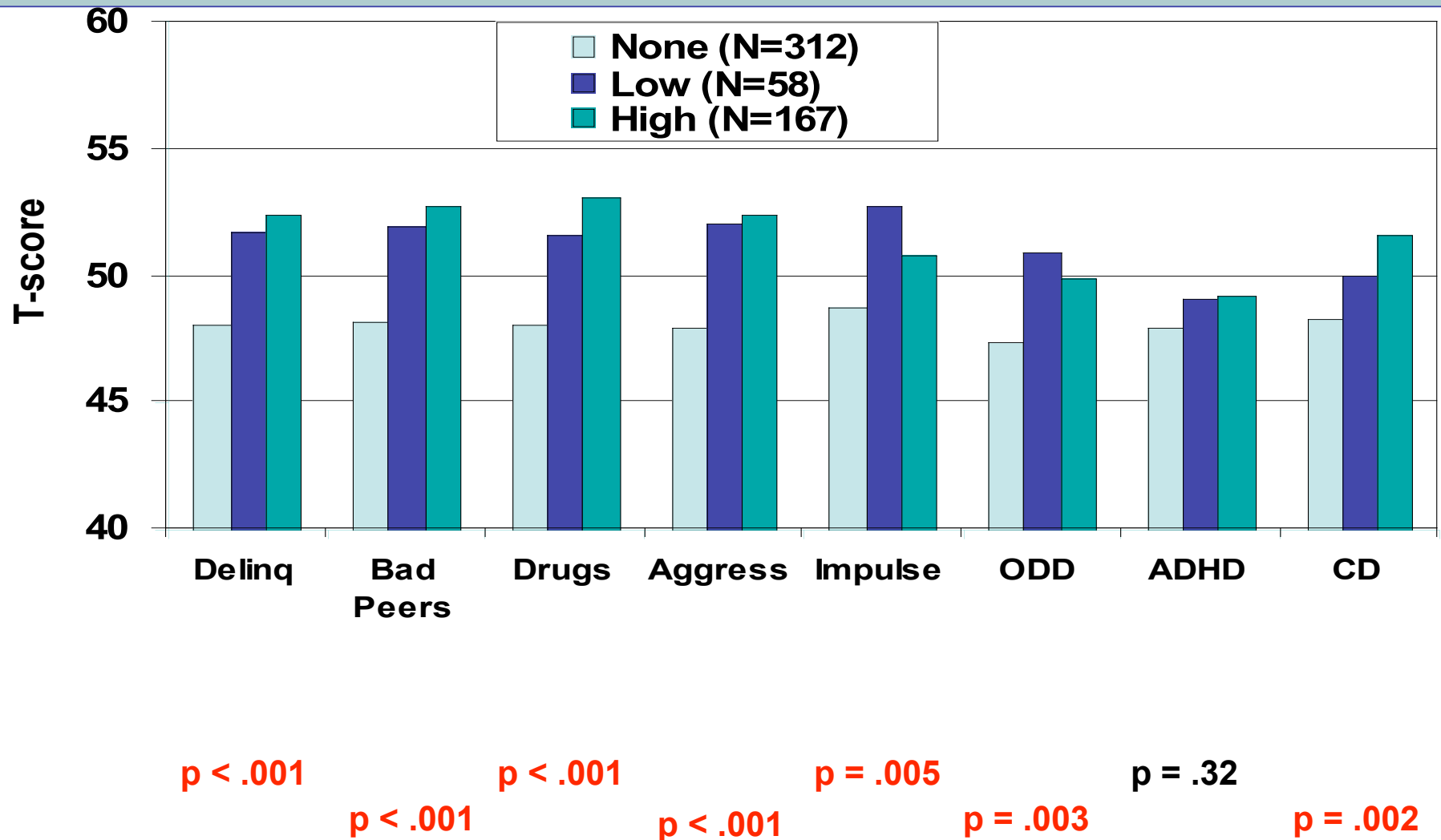
Parent smoking: A simple model?



Indicators of Disinhibitory Behavior

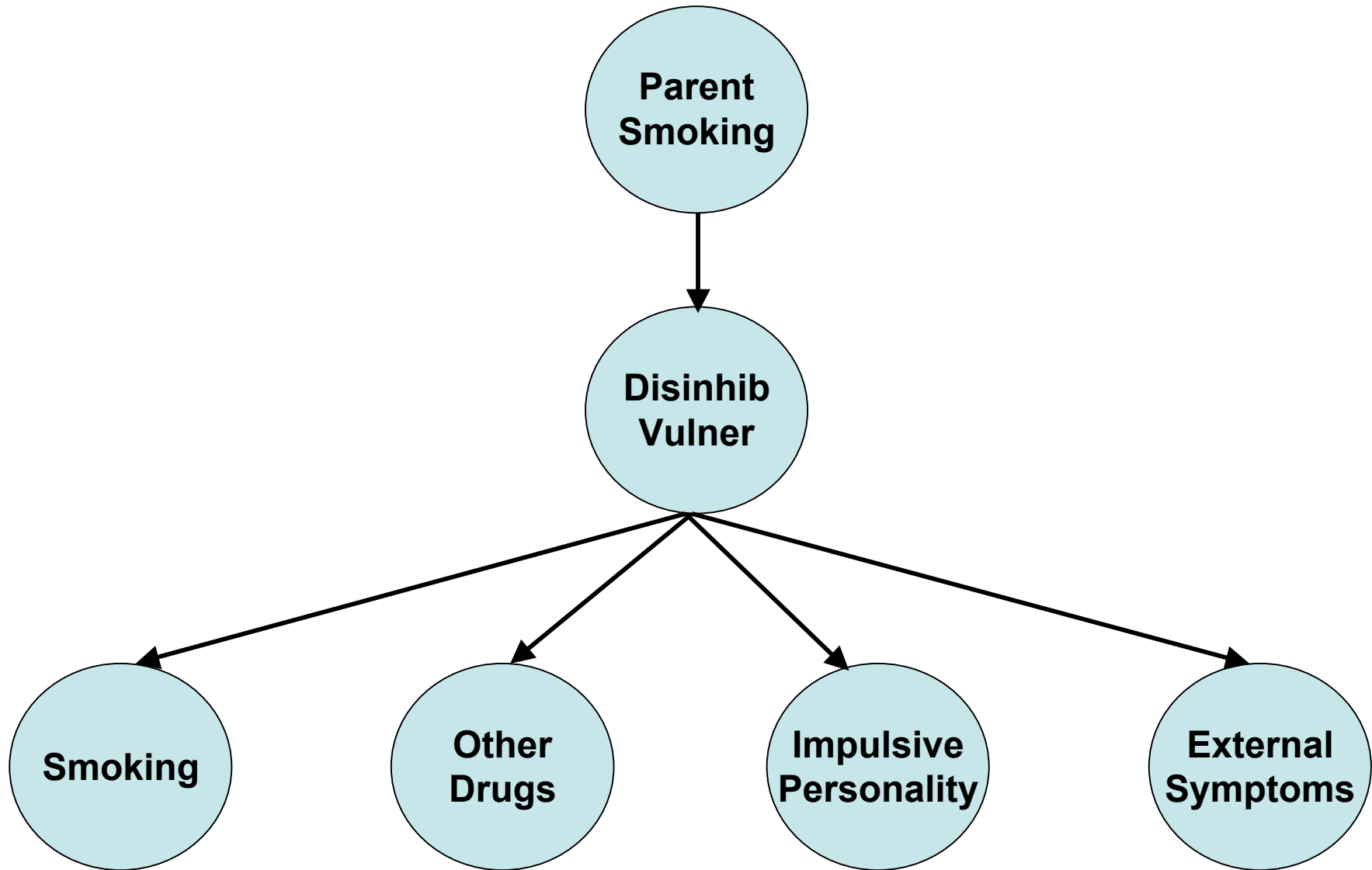
- **Delinq** – Number of delinquent acts
- **Bad Peers** – Exposure to bad peer models
- **Drugs** – Experimentation with other drugs
- **Aggress** – Personality report of aggression
- **Impulse** – Personality report of impulsivity
- **ODD** – DSM symptoms of oppositionality
- **ADHD** – DSM symptoms of ADHD
- **CD** – DSM symptoms of conduct disorder

Parent Smoking and Disinhibition

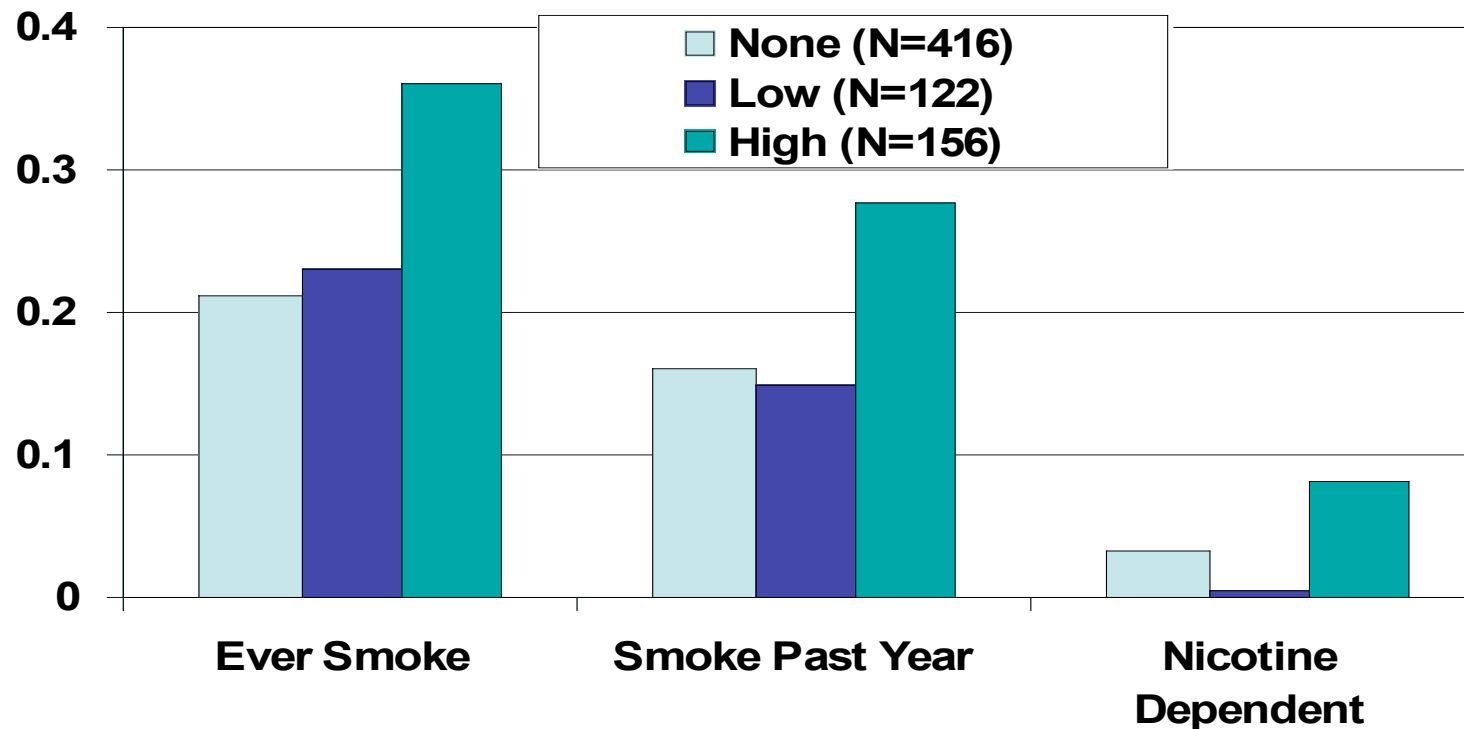


Legrand et al. (2006)

Parent Smoking: A More Complex Model



Parent Smoking as a Risk Factor in Adopted Offspring

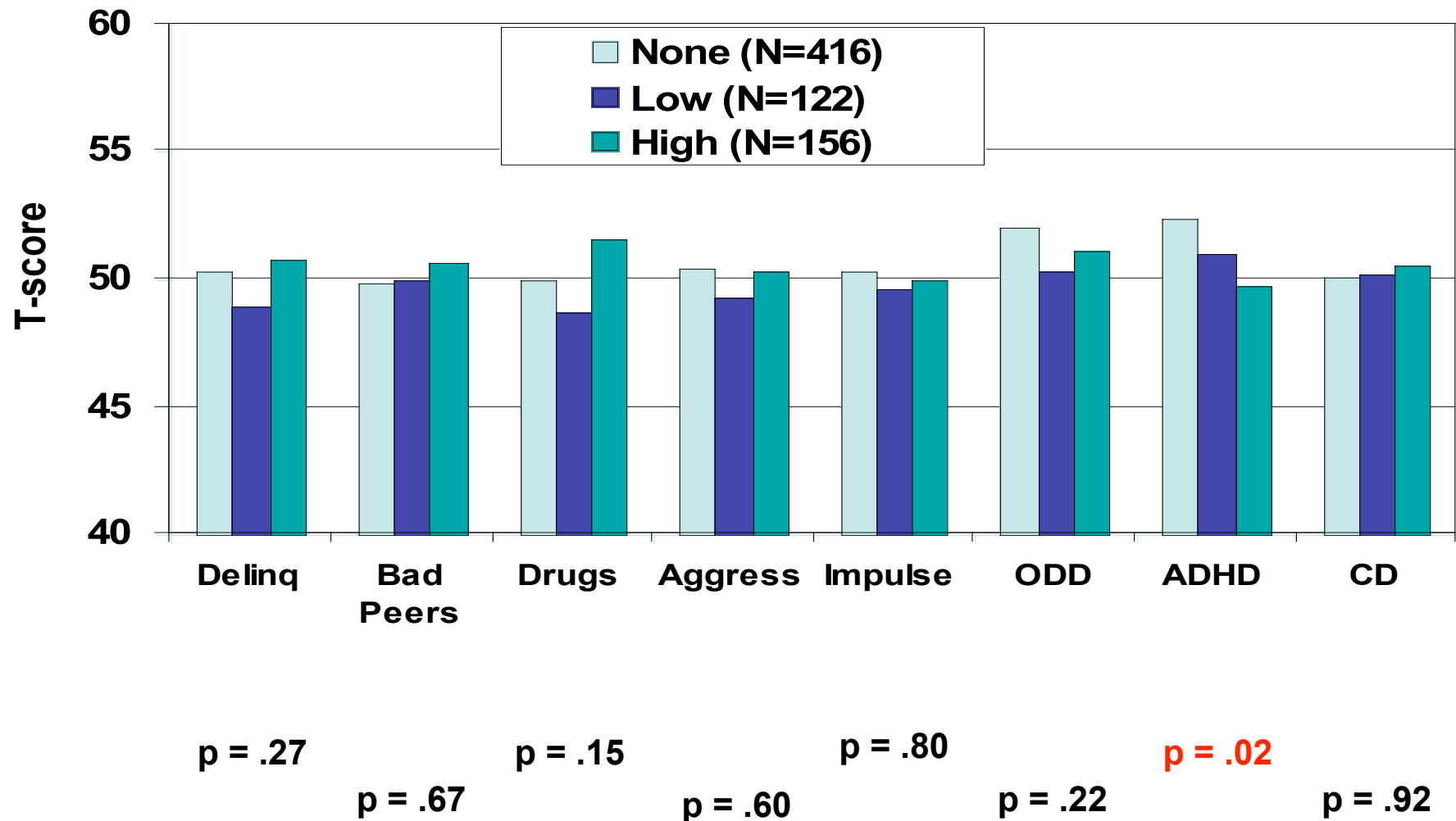


(p = .001)

(p = .003)

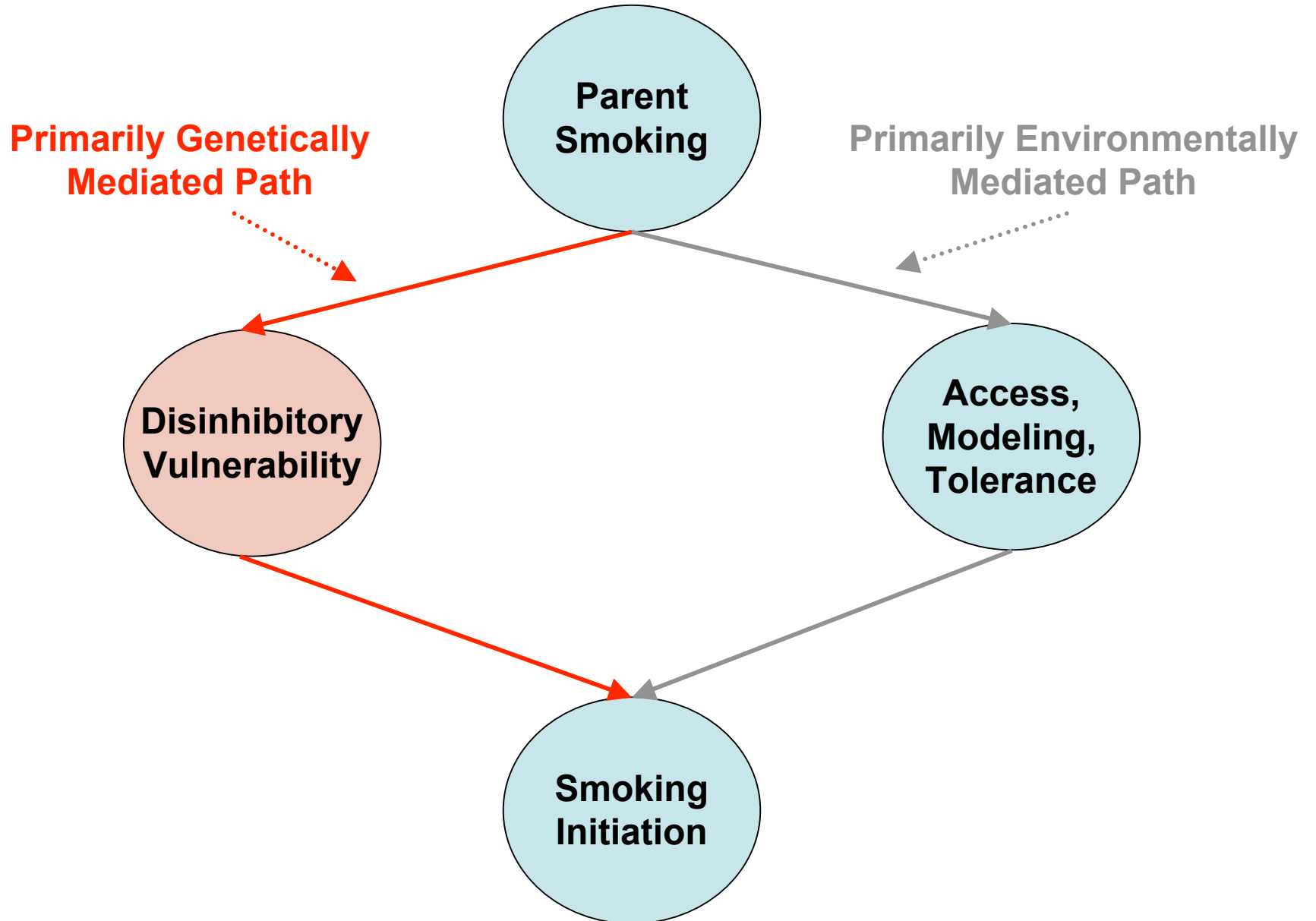
(p = .04)

Parent Smoking and Disinhibition in Adopted Offspring



Legrand et al. (2006)

Parent Smoking: A G-E Model



Conclusions

- “Heritability studies” were essential to re-establish the relevance of genetic factors
- Focus now on understanding the mechanisms of G-E interplay, which requires BG methods
- Example:
 - Two pathways in the familial transmission of smoking