Background

- Genetic models are the major part of Nature – Nurture debate
- Early debates focused on alcoholism
- Which causes alcoholism
  - Nature – Biology, Genetics, etc
  - Nurture – Environment
- Many proponents on both sides

Early Discussions of a Genetic Role in Alcoholism

- Aristotle
  - Drunken women bring forth children like unto themselves
- Hippocrates
  - Also observed some diseases run in families.
- Theorists contended that alcoholism was the same.
- Continued until the 20th century

Concordance Rates

- Defined as the number of people who develop a disease when comparing two groups
- E.g. Families with an alcoholic member have a higher number of offspring who develop alcoholism than families that do not have an alcoholic member
- Also occurs with other mental disorders as well

Pure Genetics Models

- Have primarily focused on alcoholism
- Have been around for a long time. Contend that some particular gene causes alcoholism
- Early theories used markers (hair color or eye color)
- Looked at concordance rates
- Problem, no real evidence to support the model
Evidence before Jellinek

- Lots of discussion
- Was tied to the disease model
- No solid evidence to support the genetics model

Jellinek

- In his analysis, found alcoholics went through different stages, also had different types.
- Contended alcoholics had "something" that made them different from individuals who drank alcohol
  - Called the variable the "X" factor

Consequences

- Jellinek did not identify the "X" factor.
  - Did not have enough evidence to say what it was
  - That did not stop others "Primarily in AA" to say the "X" factor was a genetic difference.
  - Result - Became Dogma
  - You either buy into the model or suffer the consequences.
- Problem, still no real evidence to support the model.

Twin Studies (Goodwin)

- Had been observed for centuries that offspring of alcoholics had a higher rate of developing alcoholics.
- Goodwin began to examine rates of alcoholism among twins

Fraternal Twin Studies

- Compared concordance rates of alcoholism between fraternal twins and offspring who were not twins
- Found that fraternal twins had higher concordance rates of alcoholism than offspring that were not twins
- Conclusion, this was evidence to support the contention that alcoholism was genetic

Problem

- Were correlational designs
- The rates while statistically significant were not that large practically
  - Face validity issue
- Fraternal twins also interact differently than non-twins
  - Also raised in the same environment
  - Is a nurture issue
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**Monozygotic Twin Studies**

- Are twins who share the same genetic information at birth
- Monozygotic twins had a higher concordance rate for alcoholism than fraternal twins and non-twin offspring
- That is, when one twin developed alcoholism, the other twin had a higher probability of developing alcoholism

**Problems**

- Monozygotic twins are not like other twins. They do similar things.
  - E.g. same clothes
  - They share the same environment
  - Same problems
- Also is a correlational design

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**Adoption Studies**

- To resolve the problems with previous twin studies, Goodwin looked for monozygotic twins that were separated shortly after birth (usually due to parental fatalities).
- Found some European countries kept records of these twin groups.
- So, compared monozygotic, fraternal, and non-twin groups

**Result**

- Found that when one monozygotic twin was an alcoholic, 60% of the time the other twin was an alcoholic.
- This was held as “the” definitive study that genetics caused alcoholism
- Used by all of the proponents for the model

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**Problem**

- If 60% of the time the person became an alcoholic, what about the other 40 percent that did not become an alcoholic?
- Again, despite the controls, it is still a correlational design.
- Only applies to alcoholism
- If there is a gene for alcoholism, is cocaine or heroin addiction genetic as well? If so, what gene causes them?
- Alternative explanation, if one gene does not cause the problem, what gene does?

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**Alternative 1: Multiple Gene Models**

- It must be that there are multiple genes that cause alcoholism.
- You must have ALL of the genes
- Problem, Monozygotic twins by definition have the same genetics. So, when one person is alcoholic, their twin should become alcoholic
- Does not occur
- Also, what about other drugs?
Alternative 2: Recessive Gene Models

- If not all monozygotic twins develop alcoholism, there must be a recessive gene that is expressed in some of the monozygotic twins (results in alcoholism) and is not expressed in the other monozygotic twin (results in no alcoholism).
- Problem
  - Which is the gene's
  - How does it explain other types of substance abuse?

Alternative 3: Diathesis – Stress Models

- Contends you have a genetic predisposition to alcoholism but you must have the right environment before you become an alcoholic.
- Explains the Goodwin twin studies

Problem

- Which is the right environment?
  - Some people live with alcoholics but do not develop alcoholism
  - Others do not live with alcoholics but become alcoholics.
- What about other substances?
  - Why do some people never become heroin addicts but are around the substance?
  - Also, which is the right gene

Alternative 4: Biochemical changes

- One gene does not cause one substance abuse disorder, what it does is change the brain biochemistry, levels of some neurotransmitter, or reward pathway.
- Problems
  - All of the research is correlational [despite the techniques used (PET)]
  - Data is inconsistent

Human Genome Study

- Looked at identifying genes that might cause alcoholism
  - Some have been identified that might have a role
  - None have been identified that specifically cause alcoholism

Conclusions

- There are a lot of genetic models
- Each has major problems
- So, is alcoholism genetic?
- Answer: As of this time, the evidence does not support that alcoholism is genetic.
- Definitely does not support that other substance abuse disorders are genetic.
- Do we have genes for cocaineism, methamphetamineism, heroinism, etc?
Implications

- So, if alcoholism or substance abuse is not genetic, what does that mean to clients?
- Answer, nothing
  - The person still has the problem
  - The therapeutic techniques are the same

What does it mean to academics?

- Answer, A lot
  - Directly goes at the heart of why a person becomes an alcoholic
  - If alcoholism is a learned behavior, with appropriate training, it could be unlearned - Can become social drinkers
  - Some evidence to support this contention
    - Sobell studies, Miller studies, Shuckett studies
  - Problem,
    - While some individuals become social drinkers with or without treatment, others revert to out of control drinking.
    - How do you determine which treatment to use
      - Currently cannot do with high reliability

Other Explanations

- Alcoholism and all substance abuse is a learned behavior
- Results in brain biochemical changes
- This results in behavioral changes, out of control drinking, etc.
- Changes take a long time to change or recover

As discussed earlier

- May have lots of different types of alcoholics
- May need different types of treatment
  - Education
  - Retraining a person to drink
  - Abstinence
  - This model does not work for other drugs
    - Due to high tolerance and addiction potential

If Genetic What are the Political Implications?

- General population does not believe it is genetic.
- If it is genetic, allows the person to not take responsibility for their behavior
- Court/legal issues as well
  - Can you get off because you are alcoholic or a substance user
  - Court can monitor your behavior
- Mental illness issues
  - Could be institutionalized for a mental condition
- Insurance issues

Point to Note

- It does not matter where one stands academically, if the client is in out of control drinking or has health issues, abstinence is probably the best approach

- However, if one has tried multiple abstinence models and has not controlled the problem, then other solutions may be needed
  - Medications
  - Controlled drinking
  - Harm reduction
Depends on the client’s condition.

- Many clients need abstinence
- Some do not
  - A teen caught drinking at a party probably does not need inpatient treatment unless they are experiencing tolerance and withdrawal symptoms
- Thus, a thorough assessment of the client’s condition is needed

Conclusion

- Lots of issues
- Has a lot of issues
- Causes a lot of controversy
- Needs significantly more EXPERIMENTAL research
- Does not really need more CORRELATIONAL research