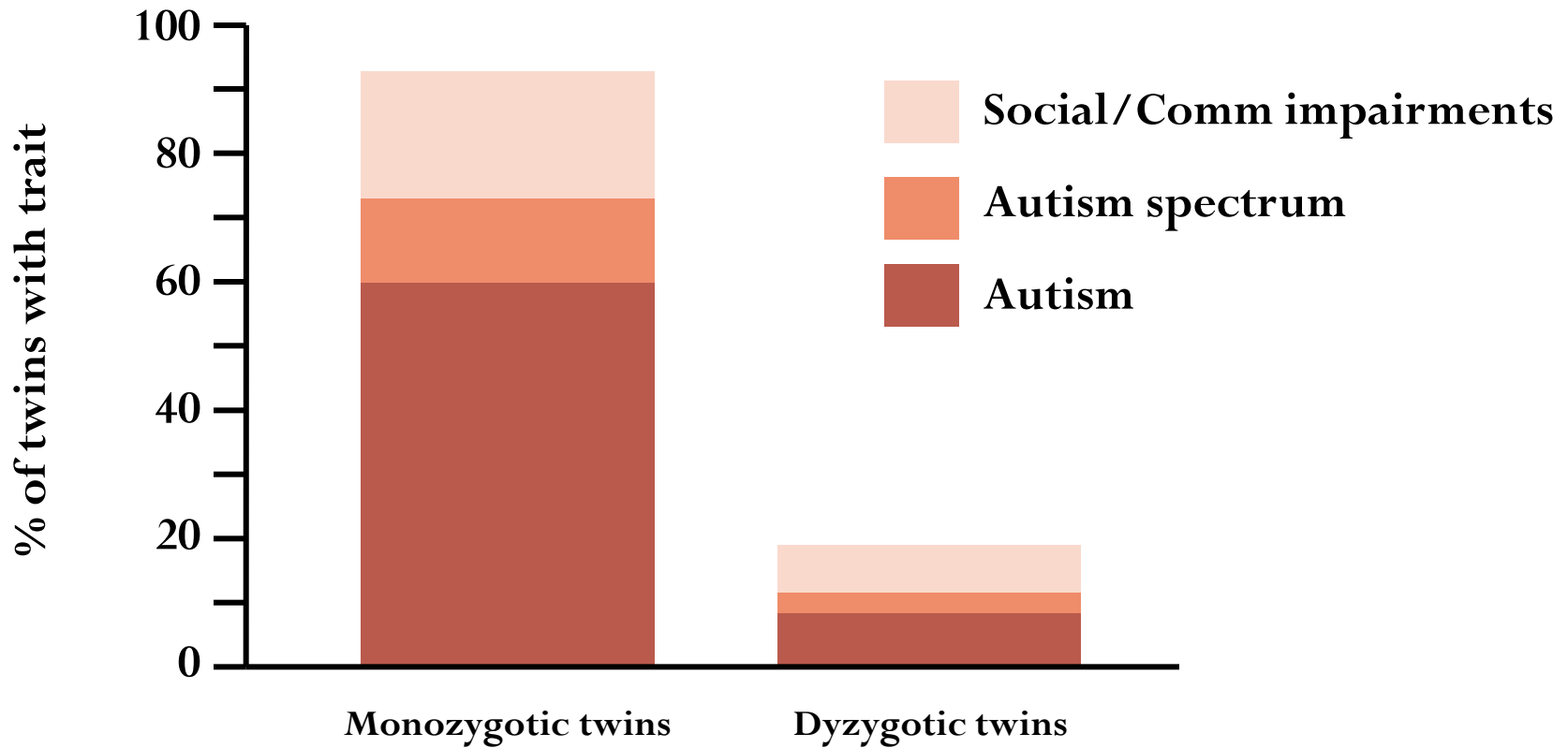


The Broader Autism Phenotype in Simplex and Multiplex Families

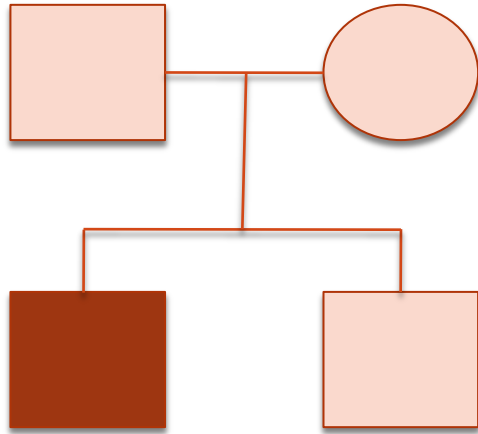
Jennifer Gerdts, M.S.
LEND Leadership Project
June 7, 2010

Twin Studies



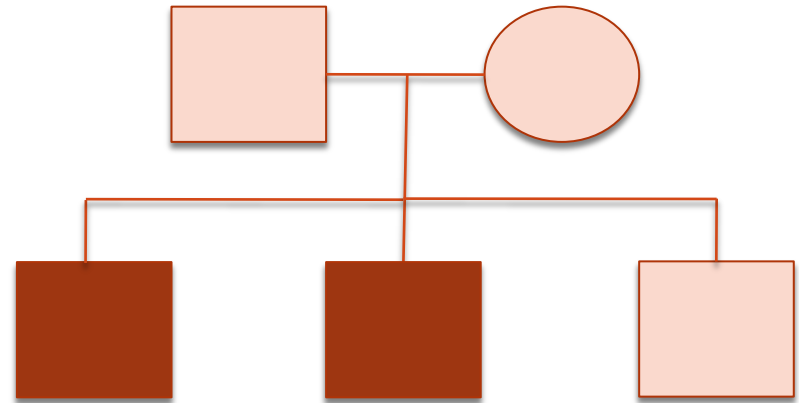
Bailey et al., 1995

Simplex Families



7-10% *de novo* CNVs

Multiplex Families



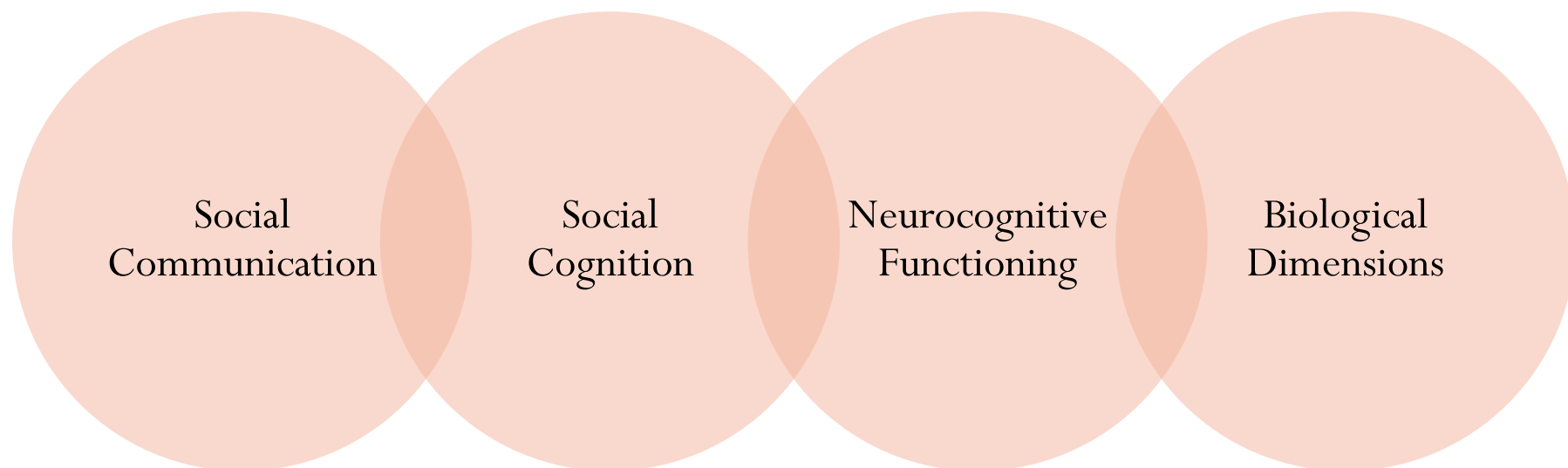
2 - 3% *de novo* CNVs

- *de novo* CNVs are more common risk factors in simplex compared to multiplex ASD
- Suggest distinctive genetic causal mechanisms for simplex and multiplex ASD

Phenotype?

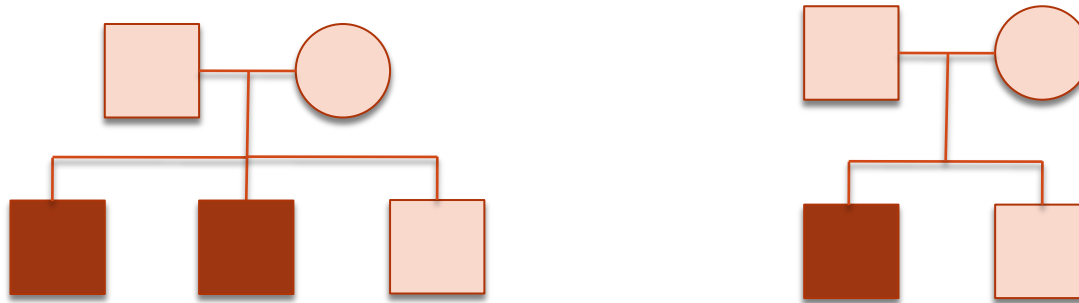
- General diagnostic categories in complex psychiatric disorders like ASD complicate genetic studies
- Quantifiable components of the phenotype versus general diagnosis
 - Often present in unaffected relatives
 - Insight into inheritance patterns
 - Deemed *broader autism phenotype*

Broader Autism Phenotype



- Milder symptoms
- Male > Female relatives
- At least half of relatives *do not* have quantifiable impairments
 - Differences may be present in subset of relatives

Traits in Simplex versus Multiplex Families



- *De novo* CNVs more common in simplex ASD than multiplex
- Behavioral manifestations of genetic differences
 - Compare broader autism phenotype traits in families
 - Simplex probands => sporadic genetic event
 - Thus, family members show fewer broader phenotype traits

Aims

Aim 2. To increase an understanding of head circumference in unaffected parents and siblings within simplex versus multiplex families

Aim 3. To assess the relation between head circumference and degree of expression of the broader autism phenotype in family members within simplex and multiplex families

Exploratory

To explore the broader autism phenotype in undiagnosed parents and siblings of individuals with ASD in simplex and multiplex families

Aim 1. To obtain a multifaceted assessment of the broader autism phenotype in unaffected parents and siblings within simplex and multiplex families

Aim 4. To determine the relation between proband characteristics and broader autism phenotype traits in family members within simplex and multiplex families

Participants: Broader Sample

Multiplex Families

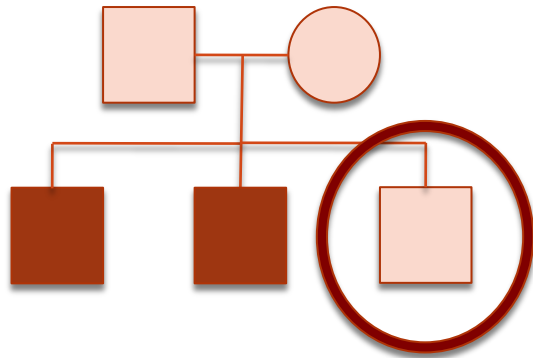
- Family Study of Autism
 - 1998-2008
- 2 or more children with ASD
- 311 total families
 - 2 children, $n = 284$
 - 3 children, $n = 25$
- Ages:
 - Probands, $M = 8.67$
 - Siblings, $M = 9.71$
 - Mothers, $M = 38.74$
 - Fathers, $M = 40.68$

Simplex Families

- Simons Simplex Collection
 - 2007 – present
- Exactly one child with ASD and no family history of the disorder
- Goal is 300 families, 196 seen to date
- Ages:
 - Probands, $M = 9.22$
 - Siblings, $M = 10.78$
 - Mothers, $M = 41.04$
 - Fathers, $M = 42.66$

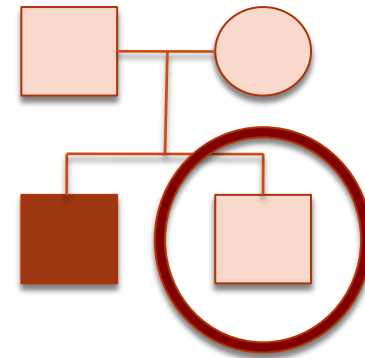
Participants: Dissertation Sample

Multiplex Families



- **119** families include an undiagnosed sibling
 - Of these, 60 with complete data will be randomly selected to participate
 - $n = 180$ total participants

Simplex Families



- **163** families include an undiagnosed sibling
 - Of these, 40 will be randomly selected to participate
 - $n = 120$ total participants

Mothers, fathers, and undiagnosed siblings will be included in the proposed project

Clinical Implications

- Family planning
 - Risk of future children in sporadic case may approximate population risk
 - Multiplex with broader phenotype? Perhaps greater risk
- Intervention planning
 - Parent- and sibling-delivered interventions would be impacted by broader autism phenotype traits
 - Family history of ASD could predict those who are higher risk for broader phenotype

Thank you

Acknowledgements

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