The Center for Research and Outreach

Putting Research to Work *for Families*

Focus:
Civilian

Sex Differences in Nonverbal and Verbal abilities in Childhood and Adolescence

Toivainen, T., Papageorgiou, K.A, Tosto, M.G., & Kovas, Y. (2017). Sex differences in non-verbal and verbal abilities in childhood and adolescence. Intelligence, 64, 81-88. *Intelligence* , *64*, 81-88. doi:10.1016/j.intell.2017.07.007

SUMMARY: Individuals' cognitive abilities can have implications on the quality of their task performance and social behaviors (e.g., verbal communication). Examining differences in cognitive abilities across the sexes can help to better understand the patterns of cognitive development. This study investigated sex differences in cognition by exploring nonverbal and verbal abilities across development in a sample of twin siblings. The findings indicate that sex differences in verbal and nonverbal abilities exist, with distinct variations from ages 2 to 16 years.

KEY FINDINGS:

- Females performed better than males at verbal and nonverbal communication at age 2, 3, and 4 years old. However, there were no gender differences in nonverbal ability at ages 7, 9, 10, 12, 14, and 16 years old.
- Males performed better at nonverbal communication at ages 10 and 12 years old. However, there were no gender differences in verbal and nonverbal ability at ages 14 and 16 years old.
- There was no difference in verbal or nonverbal abilities between females with male co-twins and females with female co-twins from ages 2 to 16 years old.

IMPLICATIONS FOR YOUTH DEVELOPMENT PROFESSIONALS:

- Examine ways to create positive and personalized relationships with the children facing difficulties in establishing age-appropriate bonds
- Facilitate collaborations with community partners to help provide youth with skills to strengthen verbal and nonverbal abilities

IMPLICATIONS FOR PROGRAM LEADERS:

- Host classes for children and youth that aim to improve their verbal communication skills
- Engage youth in small group activities that promote healthy interpersonal communication

IMPLICATIONS FOR POLICY MAKERS:

- Continue to support the programs that explore differences in communication patterns across diverse school and after-school settings
- Recommend the development of curriculum for training professionals on how to identify children who have difficulty in verbal and nonverbal communication with their peers and parents

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REACH
Leveraging Evidence and Science into Practice

METHODS

- Data were obtained from Twin Developmental Study (TEDS), an ongoing longitudinal study of twin pairs born in the United Kingdom between 1994 and 1996.
- A range of psychological test were used to measure verbal and nonverbal abilities such as the MacArthur Communicative Development Inventories, Parent Report of Child Ability, picture Completion Test, Wechsler's Intelligence Scale for Children, Raven's Standard Progressive Matrices, and the Mill-Hill vocabulary scale.
- Analysis was done to assess sex differences in nonverbal and verbal abilities across development. Additional analysis was done to explore if females with male co-twins outperform females with female co-twins on verbal and nonverbal abilities.

PARTICIPANTS

- Participants were twin pairs born in England and Wales between 1994 and 1996.
- The range of the sample size was between 14,187 (at age 4 years) and 4,959 (at age 16 years).
- Participants who had significant medical or mental conditions, early birth complications, and those who did not speak English as their first language were excluded from the study.
- No racial/ethnic or gender information about the participants was included in this study.

LIMITATIONS

- The demographics of participants (e.g., gender or race/ethnicity) was not reported, which limits the generalizability of findings.
- Tests used to measure verbal and nonverbal abilities differed in content measurements at different time points. This could have impacted result interpretation of differences in male and female cognitive abilities.
- The sample size dropped significantly throughout the course of the study. This could have impacted the result interpretation of differences in male and female cognitive abilities, because those who remained in the study may be different from those who withdrew, or left the study.

AVENUES FOR FUTURE RESEARCH

- Replicate the study with participants who represent diverse racial and ethnic groups and gender identities
- Collect physiological data (e.g., MRI activity during task completion) to measure verbal and nonverbal abilities across life span
- Gather data on youth outcomes associated with different verbal and nonverbal abilities, such as peer relationship satisfaction or job performance

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