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Weighing More Than Your Twin at Birth May Predict Better Achievement at School: Socioeconomic Status Exacerbates Effects

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The Effects of Birthweight on Child Development Prior to School Entry

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Research has shown that children who are born at a low birthweight are less likely to do well in school and more likely to live in lower-income neighborhoods as adults. A new study of twins looked at the effect of birthweight on children's cognitive and socioemotional outcomes at 4 years old, taking into account families' socioeconomic status (SES). The study showed that weighing more than your twin before starting school may help with achievement. It also found that socioeconomic status accentuates the effects of birthweight on early development.

The findings, from researchers at Georgetown University, appear in *Child Development*, a journal of the Society for Research in Child Development.

"Our study suggests that higher birthweight predicts greater school readiness, more so for low-SES children," notes Caitlin Hines, a doctoral student at Georgetown University, who led the study. "It follows that early intervention with lower-birthweight infants may reduce the long-term implications of birthweight. Such intervention should address cognitive or socioemotional deficits before kindergarten."

Researchers used data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) to compare the outcomes of 1,400 twins whose birthweight differed from one another. As a nationally representative sample, the ECLS-B reflects the demographic characteristics of the U.S. population in geography, location, sociocultural background, and religion. For this study, children were assessed at 9 months and at 4 years.

Researchers also interviewed the children's primary caregiver (usually the biological mother) and when the children were 4, the children's primary child care provider. Children's math and reading scores were assessed at age 4 and parents and child care providers were asked about children's externalizing behavior (e.g., aggression) and prosocial behavior (e.g., helpfulness). Parents' SES was measured via maternal education and household income.

The study found that higher birthweight significantly predicted higher math and reading scores at age 4. This suggests that weighing more than your twin is associated with small but significant increases in both math and reading scores prior to school entry, the authors note.

In addition, higher birthweight also significantly predicted decreases in externalizing behavior (behavior that is aggressive, impulsive, or disruptive) and increases in prosocial behavior (behavior that is friendly, empathetic, or interested), the study found. The results for behavior reported by parents were also significant, though smaller. These estimates suggest that weighing more than your twin is associated with small decreases in externalizing behavior and small increases in prosocial behavior prior to school entry, the authors explain.

Finally, the study found that birthweight differentially affects children by SES on reading and prosocial behavior. And it found that SES-based differences are present before school entry, suggesting that differences in effects by SES may depend on early environmental factors. Infants with lower birthweight who are born into low-SES families may face a biological and environmental double jeopardy that affects their readiness for school, according to the study.

The authors point out several limitations to their work. Because twins tend to weigh less at birth, are born earlier, and have more birth complications than singletons, the study's results may not apply children who are not born as twins. In addition, only children who attended nonparental care had provider-reported behavior scores, and children in parental care tend to be more disadvantaged than those in nonparental care, which may underestimate the effect of birthweight on provider-reported behavior.

"Birthweight affects educational attainment in part because the poor neonatal health conditions that lead to low birthweight underlie neurological development in ways that also affect cognitive development," explains Rebecca Ryan, Provost's Distinguished Associate Professor of Psychology at Georgetown University, who coauthored the study. "The same neonatal health conditions may also affect the development of socioemotional skills, which are an important aspect of school readiness and academic success. Our results suggest that these effects are stronger for children born into low-SES families."

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Summarized from *Child Development, The Effects of Birthweight on Child Development Prior to School Entry* by Hines, C (Georgetown University), Padilla, C (Georgetown University), and Ryan, R (Georgetown University).
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