

Why Does Family Wealth Affect Learning?

How does the mind work—and especially how does it learn? Teachers' instructional decisions are based on a mix of theories learned in teacher education, trial and error, craft knowledge, and gut instinct. Such knowledge often serves us well, but is there anything sturdier to rely on?

Cognitive science is an interdisciplinary field of researchers from psychology, neuroscience, linguistics, philosophy, computer science, and anthropology who seek to understand the mind. In this regular American Educator column, we consider findings from this field that are strong and clear enough to merit classroom application.

BY DANIEL T. WILLINGHAM

Question: Why do wealthy kids usually do better in school than poor kids?

Answer: Disadvantaged children face a host of challenges to academic success. These challenges fall into two broad categories. First, as one might expect, wealthier parents have the resources to provide more and better learning opportunities for their children. Second, children from poorer homes are subject to chronic stress, which research from the last 10 years has shown is more destructive to learning than was previously guessed. But research also shows it's not all about money.

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“Common knowledge” does not always turn out to be true, especially in matters relating to schooling. But when it comes to wealth and educational outcomes, common knowledge has it right: on average, kids from wealthy families do significantly better than kids from poor families. Household wealth is associated with IQ¹ and school achievement,² and that phenomenon is observed to varying degrees throughout the world.³ Household wealth is associated with the likelihood of a child graduating from high school⁴ and attending college.⁵ With a more fine-grained analysis, we see associations with wealth in more basic academic skills like reading achievement⁶ and math achievement.⁷ And the association with wealth is still observed if we examine even more basic cognitive processes such as phonological awareness,⁸ or the amount of information the child can keep in working memory (which is the



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mental “space” in which thinking occurs),⁹ or the extent to which the child can regulate his emotions and thought processes.¹⁰

But these effects are not due to household income alone. In fact, it’s unlikely that they are *directly* due to income at all.¹¹ Imagine showering cash on a low-income family; there will not be a sudden boost to the children’s cognition or academic achievement. The effects of wealth must be indirect and must accrue over time.

Indeed, researchers believe that a useful way to conceive of the impact of wealth is that it provides access to opportunities. Money is an obvious enabler of opportunities: cash buys books, and summer enrichment camps, and access to tutoring if it’s needed. But in addition to financial capital, two other types of capital afford opportunities for children: *Human capital* refers to the skills or knowledge of individuals, usually based on their education and experience. Parents who have a good deal of human capital in the form of education will, in subtle and overt ways, impart their knowledge to their children. *Social capital* refers to beneficial connections in social networks, such as ties to people with financial or human capital. Parents with a lot of social capital might have friends or relatives who can provide helpful summer internships for their child, or they might be more likely to have well-placed friends who can advocate for their child if he has a problem at school.

Naturally, we’d expect financial, human, and social capital to be related. For example, someone who attends college is increasing her human capital through education, but she will also make friends in college and thus have connections (social capital) with other well-educated people.¹² That is why, rather than simply measuring family wealth, most researchers use a composite measure called *socioeconomic status* (SES) that includes measures of family income, parental education, and parental occupation.

How does SES affect educational outcomes? Most theories fall into one of two categories. *Family investment* models offer an intuitive mechanism: high-SES parents have more capital, and so can invest more in their children’s development.¹³ *Stress models* suggest that low SES is associated with long-term stress that has two consequences: it makes parents less effective, and it has direct, negative biological consequences for children’s maturing brain systems.¹⁴ These models are not mutually exclusive. Both could be right, and indeed, there is evidence that both factors contribute to the difficulty that low-SES students have in school. Indeed, much of the challenge in this research is sepa-

rating the many factors that can have multiple effects and tend to occur together. For example, crowded housing conditions occur because of lack of financial capital and likely have direct effects on children’s learning (it’s hard to study in a crowded, noisy environment) as well as indirect effects (crowding makes health problems more likely and leads to greater stress). Despite these challenges, researchers have succeeded in identifying some of the many factors that contribute to the greater academic problems faced by students in low-SES families. Let’s take a look at some of this evidence, bearing in mind that the studies cited here used methodologies that separate the effects of these co-occurring factors.

Family Investment Theories

Some factors associated with SES seem to be straightforward consequences of the amount of money available to the family. For example, low-income families cannot as readily afford books, computers, access to tutors, and other sources of academic support.¹⁵ Indeed, these sources of intellectual stimulation are associated with better school outcomes,¹⁶ and many poor families cannot afford them.¹⁷

There are other, more subtle consequences of SES, and these effects are present even before a child is born. Low-SES mothers tend to have less adequate access to health care, so their babies are at greater risk for low birth weight,¹⁸ which is a risk factor for cognitive impairment¹⁹ with consequences measurable at least into middle childhood.²⁰ There is also a high incidence of fetal alcohol syndrome in children born to low-SES mothers.²¹ Fetal alcohol syndrome is caused by alcohol abuse by a woman when she’s pregnant, and it results in a host of cognitive deficits for the infant. The greater incidence in low-SES pregnancies is thought

to result not only from differences in mothers’ drinking habits but, at least in part, from interactions with poor nutrition and possibly genetic factors.²²

Once born, children in low-SES families have overall poorer health, which has a lasting impact on educational outcomes.²³ They are more likely to have a nutritionally inadequate diet²⁴ and poor access to health care,²⁵ which likely has wide-ranging health consequences. They are more likely to develop serious chronic health problems,²⁶ which make low-SES kids miss more days of school than their peers,²⁷ which in turn is associated with negative school outcomes.²⁸ Missing school is particularly destructive for low-SES kids; they benefit *more* from school than their wealthier counterparts,²⁹ presumably because their homes

There are subtle consequences of low socioeconomic status, such as greater risk for low birth weight, which is a risk for cognitive impairment.



and neighborhoods do not provide the same cognitive richness and challenge.

Poor children are also exposed to a number of risks in their physical environment.³⁰ They are more likely to live in substandard housing with greater exposure to lead, and subsequently show higher blood lead levels than wealthier children.³¹ Even a trace amount of lead is known to have serious negative effects on cognition.³² Kids in low-SES families are also more likely to share a room and generally to live in more crowded conditions,³³ which is known to affect academic performance.³⁴ This effect may be due to the simple fact that a more crowded home is noisier, making it more difficult to concentrate, but crowding also likely makes it harder for parents to maintain a calm, orderly home, which also impacts cognition.³⁵

Perhaps the best-known effect of financial capital on schooling is that wealthier families often seek housing in what they believe to be superior school districts. But even before children start school, kids from higher-SES families are likely to have daycare providers who are less harsh and more sensitive than daycare providers of lower-SES kids; higher-quality daycare is associated with better math and reading scores through elementary school.³⁶ And once kids start school, poor children are more likely to have teachers who are less experienced or have marginal qualifications.³⁷ There is also evidence that, when teaching mathematics, teachers of poor children are more likely to emphasize basic computations rather than more advanced procedures and their conceptual underpinnings. The teachers of low-SES students also spend less classroom time on instruction. These data indicate that teachers are not emphasizing basic instruction because the kids are less capable; rather, low-SES kids are more likely to be assigned to teachers who emphasize basic instruction.³⁸

All of the foregoing effects are consequences of reduced financial capital. Human capital—the knowledge and skills of the parents that can be imparted to their children—is also important. For example, a great deal of evidence shows that low-SES parents speak less often to their children, and with a more limited vocabulary and simpler syntax, than their high-SES counterparts,³⁹ a phenomenon that begins when children are still infants.⁴⁰ Mother's speech in particular is tightly linked to toddler vocabulary growth.⁴¹ There is some evidence that this effect is partly due to differences in parents' knowledge about child development. Parents who know more about how children learn and grow talk to their children in more complex ways and more often solicit ideas

from their children, and high-SES parents more often have this knowledge.⁴² There is also evidence that the crowded homes of low-SES families contribute: when the home is crowded, parents are more likely to talk to children briefly and in directives.⁴³

Children in low-SES families are read to by their parents less often,⁴⁴ and they watch more television than their high-SES counterparts.⁴⁵ Their parents are less likely to buy toys that teach shapes or colors or the names of letters.⁴⁶ All of these sources of cognitive stimulation that low-SES kids miss are known to have positive impacts on reading and math scores at school.⁴⁷

Finally, more-educated parents are more concerned about imparting human capital to their children; or at least, they are more concerned about spending time with their children. Although one might suppose that parents who work more (either for extra income or out of necessity) will spend less time with their children, this effect is actually rather small.⁴⁸ Parents who work more hours

tend to sacrifice other activities in order to spend time with their children. Income is also a weak predictor of time spent with children, but there is a robust effect of education, with better-educated parents spending more time with their children.⁴⁹

What about social capital? There too, low-SES kids are at a disadvantage. Parental feeling of connectedness and involvement in their child's school is associated with student achievement,⁵⁰ and low-SES parents are less involved in their children's schools.⁵¹ At least part of this effect seems to be due to race and class differences that contribute to a lack of trust between parents and teachers or administrators.⁵² Low-SES kids also tend to befriend students who are themselves not engaged at school.⁵³

Stress Theories

There appears to be ample evidence supporting family investment theories: families with more

financial, human, or social capital invest more of it in their children, and their children benefit. Still, the support for family investment theories does not mean that other factors cannot contribute to the effect of SES on education, and indeed, there are also data supporting stress theories.

The basic idea behind stress theories was well captured by a policy statement from the American Academy of Pediatrics published in January of this year.⁵⁴ Low SES is associated with chronic stress that, if not buffered by supportive relationships, has long-term, negative consequences on brain development, which are expressed in cognitive performance. There are several steps, which I show in the figure on page 36, in the logic behind this theory, and there is at least some supporting evidence for each.

Parents who know more about how children learn talk to their children in more complex ways.



First, SES and stress are inversely correlated: that is, low-SES families suffer greater stress than mid- or high-SES families.⁵⁵ The reasons that stress is associated with SES likely seem self-evident. Among other factors, low-SES families more often go hungry (or are uncertain whether they'll have enough food in the coming month),⁵⁶ have greater worries about job insecurity and financial problems,⁵⁷ and are more likely to live in neighborhoods with high crime rates.⁵⁸ Indeed, levels of hormones associated with stress—cortisol and catecholamines—are inversely correlated with SES.⁵⁹

Second, there is evidence that these stressors affect parenting. Most parents know that they are not at their best with their kids when they feel under stress. Low-SES parents are more often harsh and inconsistent in parenting practices.⁶⁰ These practices are at least partly mediated by chronic stress; stress makes it more likely that parents will suffer behavioral and emotional problems,⁶¹ and stress, along with some differences in beliefs about discipline, accounts for much of the differences between low-, mid-, and high-SES parenting practices.⁶² Parental depression and stress have been linked with behavioral problems in children and with difficulties regulating emotions.⁶³

Third, there is evidence of a direct effect of stress on children's brains.⁶⁴ Mothers under chronic stress during pregnancy have babies who develop more slowly during the first year, and who show lower mental development at 12 months.⁶⁵ As a child, chronic stress affects how the body responds to stress—the longer a child lives under stressful conditions (crowding, noise, substandard housing, exposure to violence, etc.), the higher his or her basal levels of cortisol (a stress hormone) and the more muted his or her reaction to a standard stressor such as being

asked to work math problems in one's head.⁶⁶ In addition to changing the way the brain responds to stressful events, chronic stress changes the anatomy of the brain. For example, young adults who report high levels of verbal abuse as children show abnormalities in white matter tracts (which are like cables that connect different parts of the brain).⁶⁷ The effect of stress on the brain is most profound when children are young and the brain is still quite plastic.⁶⁸ All in all, the impact of stress on brain anatomy is wide-ranging, but not equivalent throughout. Five regions seem particularly vulnerable to its effects. These are parts of the brain that support working memory, long-term memory, spatial processing, and pattern recognition.⁶⁹ These findings showing brain changes associated with chronic stress are important because they suggest a possible mechanism by which stress may lead to differences in cognition. But they should not be

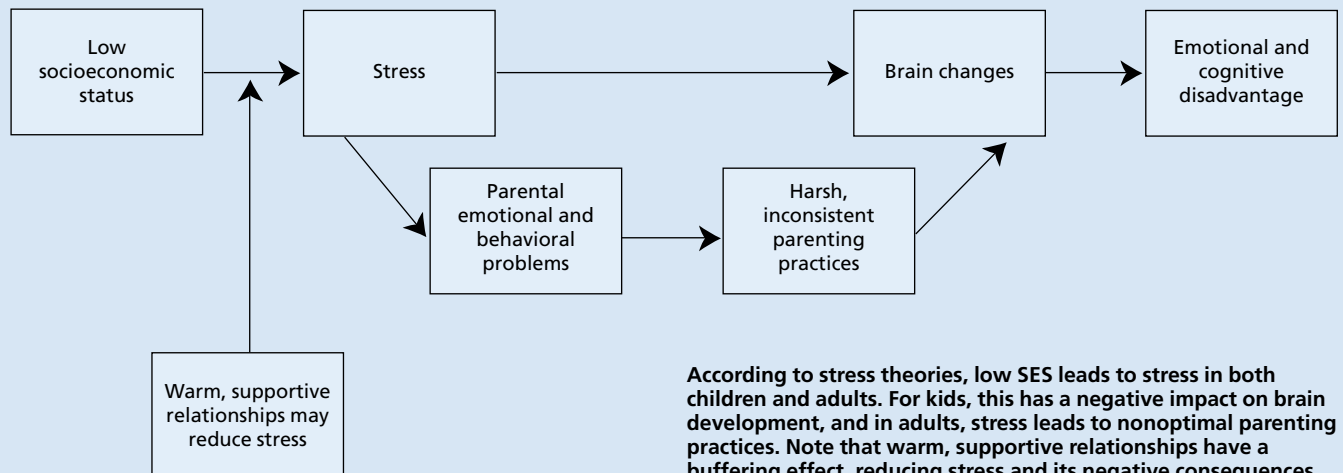
interpreted as showing that kids subjected to chronic stress have brain damage or can't learn. They surely can learn, but these data give us some idea of the challenges they face.

Fourth, there is evidence that stress directly affects children's cognitive abilities. A large research literature from laboratory studies shows that short-term stress interferes with the formation of new memories,⁷⁰ especially when the stress is

unrelated to the event to be remembered and occurs at a different time.⁷¹ For example, the child who is bullied on the bus on his way to school will remember the bullying episode well, but there will be a cost to everything he encounters at school that day. Remarkably, the same is true if he's bullied *on the bus ride home*. The stress exacts a cost to memories formed hours earlier. There is also direct evidence that the sort of stressors low-SES kids experience affect cognition. For example, when there has been

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How Chronic Stress Affects Performance



a homicide in the neighborhood less than one week prior to testing, students score significantly lower on reading and vocabulary assessments.⁷² In the longer term, there is evidence that suffering chronic stress as a child leads to reduced working-memory capacity in adulthood.⁷³

Fifth, there is evidence of the buffering effect of warm parenting. Even in the face of life stress, nurturing parents make a child feel safe, and so the negative consequences of chronic stress will be lessened.⁷⁴ In one study, having nurturing parents at age 4 was related to the volume of the hippocampus (a crucial memory structure) at age 14.⁷⁵ In another study,⁷⁶ foster children aged 3 to 5 were shown to have atypical activity in the hypothalamic-pituitary-adrenal (HPA) axis, a set of structures that responds to stress. This atypical activity was associated with adverse events in the child's past. But the children responded well to an intervention in which adults were taught to better recognize signs of distress in the child, and to respond in a sensitive way. Nine months after the training, the atypical activity in the HPA axis was reduced for these children.

What Are the Implications?

What sort of intervention would help low-SES kids fulfill their educational potential? Reading the foregoing analysis of the broad impact of SES might lead one to conclude that an equally broad array of social services targeting home and family life, as well as school interventions, would be necessary—the sort of thing that the Harlem Children's Zone is famous for and the Coalition for Community Schools has long advocated. At the least, something like the Perry Preschool seems necessary. It emphasized high-quality preschool for children living in poverty, as well as weekly home visits to involve parents and encourage them to extend the preschool curriculum to the home.⁷⁷ But what can be done by an individual teacher?

We should keep in the forefront of our minds that the trends discussed here are exactly that—trends. There are harsh, inconsistent parents with stressed-out children in high-SES homes, and sensitive, consistent parents with well-prepared children in low-SES homes. Obviously, making assumptions about kids and their home lives based on parents' income or occupation is nothing more than stereotyping. Still, it is well to keep in the back of your mind that these trends exist: a child from a poor family is more likely to be under chronic stress than a child from a middle-class family, for example.

The difficult balance is to recognize the challenges each individual child faces, but not use them as a reason to lower expectations for achievement or appropriate behavior. High expectations need not be an additional source of stress—students thrive when

high expectations are coupled with high levels of support.⁷⁸ Many low-SES kids are not getting the cognitive challenge they need from their homes and neighborhoods, but neither are they getting the support they need.

To compensate, teachers should offer in the classroom what these children are missing at home. Much of this is what we've called human capital—academic knowledge and skills—which is the teacher's bread and butter. It's also well to remember that some of this knowledge, though important for long-term success, is not academic knowledge. It's knowledge of how to interact with peers and adults, how to interact with large institutions like a school or a government agency, how to interact with authority figures, how to schedule one's time, strategies to regulate one's emotions, and so on. Some of this information is

taught implicitly, by example, but much of it can be taught explicitly.

The research reviewed here also highlights the importance of a calm atmosphere in the classroom and in the school. This is obviously a goal that virtually every teacher shares—no one wants a chaotic classroom—but knowing that a child's neighborhood and home might be noisy, crowded, and threatening makes the creation of a serene, joyful classroom all the more important. Kids in more chaotic classrooms show higher levels of stress hormones.⁷⁹ Knowing the consequences of stress for cognition, and the potential long-term consequences to the brain, makes the matter more urgent.



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The research literature on the impact of SES on children's learning is sobering, and it's easy to see why an individual teacher might feel helpless in the face of these effects. Teachers should not be alone in confronting the impact of poverty on children's learning. One hopes that the advances in our understanding of the terrible consequences of poverty for the mind and brain will spur policymakers to serious action. But still, teachers should not despair. All children can learn, whatever their backgrounds, and whatever challenges they face. □

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