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Introduction

The Invisible Line

How a strange sequence of events and one individual's arbitrary decision shaped a nation's thinking and behavior toward poverty

How Poverty Is Defined in America

Poverty is the single most significant issue impacting public education today. Every year, school districts dedicate resources, draft policies, and create new services to meet the academic and behavioral challenges associated with students coming from poverty. However, the efforts of public education to address disadvantaged students' needs are generally occurring without understanding how poverty transforms the brains of affected pupils. Attempting to address the issues of people who are poor with only partial information is like trying to complete a puzzle with crucial pieces missing. When assembling the puzzle, you can make out the general picture, but many vital details of the image are lost. The brain transformations resulting from being economically disadvantaged speak to the heart of the academic and behavioral issues schools seek to overcome. The neuroscience of poverty provides not only a clear picture of why academic and behavioral problems occur but also how to design a detailed response to best address the issues.

One needs to answer a simple question before diving into the neuroscience of poverty. How did we, as a country, get to the point that being destitute has become far too often a persistent status rather than a temporary condition?

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For many policymakers, the poverty line is a clear demarcation based on a series of mathematical calculations. You are not considered impoverished if you are above the poverty line, but you are poor if you are below the poverty line. No rational individual should find that concept cogent. What if you are a little above the poverty line? At what level above the poverty line does an individual not have to cope with the issues that plague the disadvantaged? Add to this misguided concept of a poverty line the bizarre manner in which it came into existence, and it becomes surreal.

In 1963, Mollie Orshansky, an employee of the Social Security Administration, was assigned to do an in-house research project on how being destitute affects children in America. At that time, there was no accepted measure of poverty, so she devised her own. To understand how Mollie's past influenced her thinking, one needs only to review her work history. Mollie began her lifelong career as a civil servant in 1939 as a research clerk with the Children's Bureau, where she worked on biometric studies of child health, growth, and nutrition (Fisher, 1992c). She later spent thirteen years at the U.S. Department of Agriculture (USDA) in various roles including family economist, food economist, and Director of the Program Statistics Division (Fisher, 1992a). It was there where she became acquainted with the Department of Agriculture's food plans. Food plans were a research service of the USDA designed to help families plan nutritionally adequate meals based on their budgets (no matter how meager). This service was an outcome of the Great Depression, which caused the nation to have a traumatic response to issues related to hunger. As a food economist from 1953 to 1958, Mollie planned and directed the collection and analysis of data on food consumption and expenditures of American households (Orshansky, 1957). She wrote a significant section of a summary report for the USDA's 1955 Household Food Consumption Survey. Therefore, it is not surprising that when Mollie was tasked with devising a definition of poverty, she based it on food consumption.

Mollie used the 1955 Department of Agriculture report, which said that a family of three or more spent on average one-third of their after-tax income on food. She trusted this assertion because she played a pivotal role in drafting the reference document. So she calculated a standard of poverty by multiplying the food plan's low-income household's food budget by three (Gordon, 1992). The logic was simple; if families spend one-third of their budget on food, then multiplying the cheapest of the four plans developed by the Department of Agriculture by three would reflect what a household had to earn to barely survive. The food plan

she selected was an emergency plan designed to reflect how a household could still feed a family an adequately healthy diet with severely limited funds. In 1962, it allotted \$18.60 a week for a family of four with two school-aged children (Light, 2013). Mollie's calculations would qualify as a family living in need, but could it be used as a threshold for when a family would exit poverty? After all, her assignment was to establish a standard for poverty to estimate the number of children living in difficult economic circumstances. Because of her assignment, Mollie took no care in making sure that her calculations would determine the highest amount a family could earn and still be considered poor. Instead, Mollie's task was to help to determine how many children were living in economically disadvantaged circumstances.

Today, the federal poverty guideline for a family of four is about \$26,200 or less, compared to a median income for a household of the same size as \$59,039 in 2016. Median income households should sleep soundly knowing that they are so far above the poverty line. However, they should not sleep too soundly, as experts who study the cost of living say that families of four who average \$50,000 per year can live adequately only in the least expensive areas in the United States (Gould et al., 2015a).

A Strange Sequence of Events

A strange sequence of events then unfolded. In January 1964, President Lyndon B. Johnson declared a War on Poverty. The president's Council of Economic Advisers had to establish their own measure of poverty. Around this same time, Mollie's supervisors at the Social Security Administration asked her to do an analysis extending her families-with-children low socioeconomic status thresholds to the total population. Mollie completed her analysis by late 1964. The Social Security Bulletin in January 1965 titled *Counting the Poor: Another Look at the Poverty Profile* published her findings (Orshansky, 1965).

Mollie's article came at a time when the Office of Economic Opportunity (OEO) was just established and tasked with leading the War on Poverty. The OEO was under enormous pressure to expedite programs designed to end poverty. OEO officials were exposed to Mollie's analysis because the chief researcher at the OEO, Joseph Kershaw, quoted Mollie's work in one of his reports. By May 1965, due to exposure and expediency, the OEO adopted Mollie's extended thresholds as a working definition of poverty for statistical, planning, and budget purposes. The Office of Economic Opportunity had to get on with the War on Poverty,

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and Mollie's report had already calculated the scope of the problem. By August 1969, her thresholds became the federal government's official statistical definition of poverty (Gordon, 1992). It is important to note that no review of the validity of the report's assertions was ever conducted. More surprising is the fact that no one observed the subtle difference in the use of her analysis from its original purpose. The original purpose of Mollie's report was to provide a broad estimate as to the number of children who were destitute, not to determine at what cutoff is someone not considered poor. It was an analytical formula already accepted in another branch of government and printed in an official government document; therefore, members of the OEO assumed that it must pass muster.

Trauma Alters Perception and Logic

One might ask how such an advanced nation settled on such an arbitrary definition of poverty and has based so many policies and programs on this standard? It is essential to understand that the most emotional experiences of our lives shape our views and beliefs and even alter our ability to be logical. Neuroscience determined that as emotions increase, the control functions of the prefrontal cortex diminish, which is critical for rational thinking. Most of the individuals making essential policy decisions at that time grew up during the Great Depression. The impact of the Great Depression cannot be understated. In the 1930s, men were the primary breadwinners. The emotional toll of not providing for their families had a devastating effect on parenting and most marriages. When men lost the ability to provide for their families, they lost their identity and self-worth. Common outcomes included becoming emotionally unfit to parent or completely abandoning the family (Bryson, 2016).

In many cases, multiple families crowded together in a single apartment or home to have shelter. Others would squat in an abandoned building without utilities. Two hundred fifty thousand boys left their homes attempting to unburden their families and hoping to find work or food (Uys, 2003). The nation saw a 50% increase in children entering custodial institutions (Elder, 1974). Food was so scarce that food lines were as long as a city block, and people often fought or even killed for their position in line. Children across the nation suffered from malnutrition, poor living conditions, and emotional trauma. During the Great Depression, food became the most treasured commodity for daily survival. It is not surprising that the children of the Great Depression grew up to equate poverty to the quantity of food available.

Let's look at one of the most significant hunger experiments in history. Toward the end of World War II, thousands across the world were dying of hunger. Thirty-six conscientious objectors at the University of Minnesota volunteered for a study that would bring them to the brink of starvation. Researchers at the university had designed a study in hopes of better understanding the impact of starvation to determine the best course of action to assist the vast number of individuals starved due to the war (Keys et al., 1950).

To replicate the level of starvation seen in most of Europe, the researcher starved the volunteers to the point where their metabolism slowed by 40%; sitting was painful because their muscles had atrophied, and their bellies were bloated because they had filled with liquid. One of the disturbing findings was related to the mental effects of starvation. Although the volunteers had no previous interest in cooking, they became obsessed with cookbooks and cooking recipes. They talked incessantly about every aspect of food. They reported being unable to control their thoughts, spending most waking hours consumed with food. One participant explained it like this, "Food became the one central and only thing really in one's life" (*Christian Advocate*, 1945, pp. 788–790). The study shows how people who have experienced starvation can become consumed with anything to do with food. Therefore, it is not surprising that a nation traumatized by hunger was willing to equate destitution to the ability to procure meals. If your income prevented starvation, life could be considered bearable.

Let's look again at Mollie. Historical records identify that she grew up poor, one of seven daughters born to a family of Jewish immigrants living in the South Bronx (Chan, 2006). She often spoke of her experience waiting in food lines with her mother and how her family had to forgo important needs to pay the rent. In 1970, she told the *New York Post*, "If I write about the poor, I don't need a good imagination, I have a good memory" (Eaton, 1970, p. 24). Traumatic experiences alter our brains' ability to process logically topics that provoke high emotion. America was a country biased by the Great Depression and desiring a quick remedy to poverty. Records of the early statements from individuals tasked with ending poverty produce clear evidence that government officials truly believed that they could conquer destitution and prevent anyone from experiencing a similar fate, as what was suffered during the Great Depression. Lyndon B. Johnson's address to Congress in 1964 sums up the position of many politicians and policymakers, "We shall not rest until that war is won. The richest nation on Earth can afford to win it. We cannot afford to lose it" (cited in Peters & Woolley, 1999).

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The reason many Americans believed they could end poverty was that they saw being poor as a temporary condition. If individuals worked hard and applied themselves, they could exit the status of poverty and obtain the American dream. Therefore, the logic was simple; temporary government assistance, coupled with the American work ethic, would be a quick formula to end long-term poverty. It is this same thinking that subconsciously biased efforts to revisit Mollie's definition of poverty. Individuals who believe that poverty is only a temporary condition for anyone willing to work hard enough are aided by the brain's tendency to confirm what we believe. This automated bias is referred to as *confirmation bias*, the brain's tendency to notice things in our environment that support existing beliefs, while, without malicious intent, miss contradictory evidence. As a result, if you believe that through hard work anyone can escape poverty, you can reference countless examples of poor individuals who, through hard work, not only escaped poverty but became affluent as well. The belief in the American dream offers a plausible explanation as to why the poverty line was accepted and remained without reexamination until recently. Frankly, it need not be an exact science for what should be only a temporary condition.

Begin with an Erroneous Position

A valid argument is one in which, if the premise is true, then the conclusion must also be correct. However, if the premise is false, then even a valid argument still leads to a wrong conclusion. Economists and social advocacy groups who have recently challenged the poverty line formula focused their concerns on whether food reflects one-third of a family's budget and, if so, does multiplying by three offer an accurate formula for establishing poverty. Most individuals with no economic training would conclude that Mollie's definition of poverty is deeply flawed because it is a one-dimensional assessment of low socioeconomic status (SES). Academics, statisticians, and policy analysts have pointed out numerous issues with the poverty line. The *headcount* approach used in the formula views all individuals as the same, not accounting for economic needs. Food reflects only one item now used to calculate expenses: It excludes taxes, housing expenses, work expenses, medical expenses, and benefits. The poverty line definition is also one-dimensional by not varying the cost of living based on geographic locations; for example, the cost of living in California differs vastly from Wyoming. It has also failed to adjust for changes in the standard of living since its inception. In addition, its definition of the family unit as persons living

in the same household who are related by birth, marriage, or adoption does not reflect the 21st-century family unit.

These arguments, although accurate, are clear examples of why logic asserts that when you start with a flawed premise, it focuses the attention on the flaws. The erroneous conclusion shapes the focus and argument. If the goal is to end poverty, should we not focus on the qualities of living absent of poverty rather than attempting to define the income level at which someone is economically disadvantaged? It is this flawed starting point that shaped how low SES is defined in the United States. Despite overwhelming criticism from social advocacy groups, community organizations, economists, and even people within the government, the poverty threshold remains fundamentally unchanged since 1969, with most of the attention on adjusting the existing formula. History forgets that Mollie never set out to establish a poverty line but rather to learn what percentage of children in America lived in dire circumstances.

Why Should Education Care About Poverty?

Besides the families living in poverty, education is the institution most distressed by poverty. Schools serve the fastest-growing poverty group in the United States. Children make up 23% of the U.S. population but account for almost 33% of the people living in poverty (U.S. Census Bureau, 2017). While only a percentage of families with children who are considered low-income qualify for child welfare services, all children in poverty are entitled to a free public education. One in five poor people are children, and 40% of African American children qualify as living in low SES (U.S. Census Bureau, 2017). According to the U.S. Census Bureau, 18% of American children, 13.3 million, lived below the poverty line in 2016 (U.S. Census Bureau, 2017). The result is that one in every four schools is classified as *high-poverty*, meaning that 75% of students attending qualify for free or reduced-price lunch (U.S. Department of Education [DOE], National Center for Education Statistics [NCES], 2012). The problem is only increasing, as there has been a 60% increase in high-poverty schools since 2000 (U.S. DOE, NCES, 2012, 2016a). A more accurate depiction of being disadvantaged is evident in the fact that 20.1 million students qualified for free lunch and two million for reduced lunch in 2016 (Oliveira, 2017). Some would argue that students eligible for reduced lunch can be well above the poverty line. However, eligibility still places families in the category of economically at-risk, meaning they can easily fall into poverty or spend a portion of time living in economic hardship.

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Researchers have found that the single most potent predictor of gaps in educational achievement is the extent to which students attend schools surrounded by other low-income students. A recent analysis found significant inequities between funding of high-poverty districts and low-poverty districts. The analysis found that the highest poverty districts in our nation receive about \$1,200 less per student than districts with the lowest ratio of students in poverty. The disparity grows to roughly \$2,000 per student between districts serving mostly students of color when compared to those serving the fewest minority students. Thus, those who need the most services to escape poverty receive the least despite the current initiatives designed to help low-income schools. Educators might not understand that poverty has changed over the past thirty years. The problems of economic hardship combined with issues in our society related to the treatment of the poor have over time produced changes to students' brain structure. These changes dramatically impact learning, behavior, physical health, and emotional stability. Multigenerational poverty is transforming the brain at a genetic level, producing psychological, behavioral, and cognitive issues transmitted to offspring. No institution has dealt with or will continue to confront the impact of the *new poverty* at the level that public education will. The term *new poverty* denotes a clear demarcation of how being poor is impacting children today compared to in the past.

This book helps educators learn how the brain is adapting due to poverty and its ramifications on learning and behavior. It is important to note that regarding low SES, much of the recent neuroscience research is transpiring to find solutions rather than merely understand the problem. For example, Kimberly Noble's work not only identifies the cognitive and neurobiological way in which children acquire reading but also examines how different classroom reading interventions impact identified brain regions (Noble & McCandliss, 2005). The focus on solutions is vital because it reduces the misapplication of the findings. Each chapter will present concrete strategies to help educators counteract, minimize, and in some cases, reverse the impact poverty is having on the child and adolescent brain. The War on Poverty failed at a governmental level. However, education can still fill the gap that policy and government assistance have been unable to do.