



## Navigating the Threshold: Development, Disparity, Demography

### ABSTRACT

*The Covid-19 pandemic has dramatically disrupted the quotidian affairs of the global citizenry. Economic, social, and healthcare issues were either created or realized in the midst of the pandemic, and most are still in rebound. Education, in the United States and abroad, was rapidly changed to adhere to the volatility of the pandemic and the effects of distance and hybrid learning is still realized four years later. This paper, entitled Navigating the Threshold: Development, Disparity, Demography explores the profound effects of the pandemic on the cognitive and social development of school-aged children, with a particular focus on how the sudden shift to home-based learning environments disrupted their educational and developmental trajectories. This paper investigates the challenges faced by students, particularly those in elementary and preschool education, whose learning extends beyond academic content to crucial social and human developmental skills. The central argument posits that the lack of in-person socialization and cooperative learning opportunities significantly contributed to cognitive deficits observed post-pandemic. These deficits are evidenced by declining test scores and increasing rates of absenteeism and academic failure. This paper supports its claims through an extensive review of secondary literature on cognitive development, supplemented by contemporary primary source material, including a case study from the Annenberg Center at Brown University. Furthermore, the study examines the theoretical frameworks surrounding cognitive and social development, contrasting continuous and discontinuous models of development. The continuous model, emphasizing gradual and cumulative growth influenced by environmental factors and social interactions, is particularly relevant in understanding the pandemic's impact. The paper also touches upon the intersection of moral and cognitive development and highlights how pandemic-induced educational deficits are exacerbated in lower-income communities that depend heavily on schools for various forms of support beyond education. Overall, this paper provides a comprehensive analysis of the pandemic's detrimental effects on educational and developmental outcomes, offering insights into the importance of socialization and in-person learning for student motivation and success. The findings underscore the need for addressing these developmental gaps, particularly in marginalized communities, to mitigate long-term negative consequences, and abate the effects of academic regression and low educational outlook.*

**Keywords:** Cognitive Development, Social Development, Continuous / Discontinuous Models, Regression, Scaffolding, Educational Regression.

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### I. Introduction

Despite its slightly overused description, the Covid-19 pandemic was truly unprecedented. In the span of a week, the entire country and world was obtruded out of daily routine in favor of life

online. School, which was a second home for many students not just because of the supervision but because of the myriad resources and assistance provided, was closed and students ages 4 to 18 were entreated to sit in a quiet room and perform all student responsibilities from the comfort (or discomfort) of their dwelling. School was at home, even though home, for many students, was no longer at school.

This posed myriad problems for students, especially elementary and preschool students who were learning content, but were more importantly learning and developing as human beings. The central imperative of this paper deals with how the cognitive and social development of students was affected by the conditions of the pandemic, with a special focus on how socialization and in-person learning play a role in student motivation and success. I argue that the lack of socialization and chances for cooperative and reciprocal learning outside of the constraints of immediate family contributed to the cognitive deficits coming out the pandemic, as exemplified by a downward trend in test scores and an upward trend in absences and failure statistics. My argument is primarily supported by secondary source scholarship on cognitive development, with contemporary primary source material (including a case study from the Annenberg Center at Brown University) connecting the scholarship's relevance to the post-Covid educational imaginary.

As a small remark, I also connect the issue of moral development amidst cognitive development, as well as examine how the pandemic-caused deficits are intensified in lower income communities that rely on schools for more than just academics.

### **Does Learning Precede or Proceed Development? How do Scholars Conceptualize This?**

In order to fully examine the derailment of cognitive and social development in school-aged children following the pandemic, it is fruitful to examine the schools of thought that comprise the scholarly conversation surrounding such development. Namely, as explained by Robert Slavin, there exists the discontinuous model, the continuous model and hybrid models that showcase cognitive development (Slavin, 26). Continuity understands development as dynamic: growth as gradual, continuous, and cumulative. In a continuous developmental paradigm, there is emphasis on how the environment can affect development, and how the social influences that are present in the lives of children assist in the unpacking of developmental milestones: learning precedes development. Discontinuity refers to viewing developments in a more stepwise fashion; there are defined stages that are different from the preceding and proceeding one, with little overlap and no skipping of stages. Discontinuous models of development focus on transitioning through stages of development by prescribing to a milestone and viewing development through an actualized lens; only recognizing advancement through developmental stages once maturation of all standards of development of that stage have been met. In this vein, development thus precedes learning (Slavin, 27).

There are two scholars whom Slavin identifies as producing the seminal work on discontinuous and continuous models of cognitive and social development that further psychologists and educational researchers have expounded on: Jean Piaget and Lev Vygotsky.

Jean Piaget, a Swiss psychologist whose formative advancements in psychology elaborated on previous conceptions of development as purported by the Catholic Church and rooted in the "natural origin" theme of English common law, was known for his theory of cognitive development that outlined how children develop their cognitive abilities and understanding of the world (Piaget et al., xii). Piaget's theory consists of four main stages:

#### **Sensorimotor Stage (0-2 years)**

During this stage, infants and toddlers explore the world through their senses and motor activities. They develop object permanence, the understanding that objects continue to exist even when they are out of sight.

#### **Preoperational Stage (2-7 years)**

In this stage, children begin to use symbols, such as language and mental imagery, to represent objects and events. They lack conservation, which means they may not understand that altering the appearance of an object doesn't change its essential properties. They also tend to exhibit egocentrism, perceiving the world from their perspective and struggling to understand the viewpoints of others.

**Concrete Operational Stage (7-11 years)**

Children in this stage can think logically about concrete objects and events. They can understand conservation and reversibility, and they begin to grasp concepts like classification and seriation. However, abstract thinking remains challenging.

**Formal Operational Stage (11 years and older)**

In the final stage, individuals can think abstractly, solve complex problems, and engage in hypothetical and deductive reasoning. They can reason about concepts and ideas, not just concrete objects. (Slavin, 28).

Piaget highlighted that children actively build their understanding of the world through assimilation (integrating new information into their existing mental frameworks) and accommodation (altering existing mental frameworks to incorporate new information). He posited that development follows a set sequence of stages, with each stage marking a qualitative change in cognitive abilities. (Slavin, 28).

A core concept in Piaget's ambitious project is that intellectual competence comprises a cohesive set of operations developed through reflections on the child's interactions with the world. Another key assertion is that intellectual development progresses through a sequence of interconnected stages, with knowledge from earlier stages being integrated into subsequent ones. The third critical assumption, "platonic in flavor, is that a unified cognitive competence that serves adaptation is the telos of development" (Piaget et al., x). Essentially, Piaget's developmental model encouraged self-regulatory processes to be central for development (assimilation to accommodation to assimilation) with external interaction forming a learning experience that would only reinforce such self-regulation.

Because this approach is based on the premise that learning trails behind development, that development always outruns learning, it precludes the notion that learning may play a role in the course of the development or maturation of those functions activated in the course of learning. "Development or maturation is viewed as a precondition of learning but never the result of it. To summarize this position: Learning forms a superstructure over development, leaving the latter essentially unaltered" (Vygotsky, 80).

Lev Vygotsky was a Russian and Soviet psychologist who had a different conception of development to Piaget. According to Slavin, Vygotsky emphasized the social influence on development. Vygotsky proposed that children "incorporate the speech of others and then use that speech to help themselves solve problems. Private speech is easy to see in young children, who frequently talk to themselves, especially when faced with difficult tasks" (Slavin, 39). He also focuses on mediation as a form of developmental assistance. That is, older children and adults help learners by explaining, modeling, or breaking down complex skills, knowledge, or conceptual tasks. With this, his idea of scaffolding emerges in which more competent peers or adults provide a child with a great deal of support during the early stages of learning and then diminishing that support and having the child take on increasing responsibility as soon as they are able (Slavin, 34).

One of the most important advents that sprung out of Vygotsky's cognitive development paradigm was his zone of proximal development. Unlike the Piagetian developmental model, the Vygotskian model absconds from a linearized order of milestones and the focus on actual development and instead opts to capitalize on potential for developmental advance under the ministrations of peers or adults.

"If we naively ask what the actual developmental level is, or, to put it more simply, what more independent problem-solving reveals, the most common answer would be that a child's actual developmental level defines functions that have already matured, that is, the end products of development. If a child can do such-and-such independently, it means that the functions for such-and-such have matured in her" (Vygotsky, 86).

The zone of proximal development refers to abilities that are not fully developed yet but are in the process of maturing. These abilities, which will become mature in the near future, are currently in an initial, formative stage. They can be seen as the "buds" or "flowers" of development, as opposed to the "fruits" of development. The actual developmental level characterizes mental development

retrospectively, while the zone of proximal development characterizes mental development prospectively.

From this perspective, learning itself is not equivalent to development. However, when learning is well-structured, it leads to mental development and initiates various developmental processes that would not occur without it. Therefore, learning is essential and universally important for developing culturally organized, specifically human psychological functions. (Vygotsky, 91).

Of course, while Piaget and Vygotsky pioneered a codified way to depict cognitive and social developmental processes, contemporary educators, psychologists, and researchers posit a confluence of these continuous and discontinuous models to account for the dynamism of developmental processes among different children. This is exemplified in neo-Piagetian ideals of cognitive and social development that defy the linearization in favor of identifying heuristics as being of importance of development (as posited by other scholars such as Kahneman). Building on Piaget's pioneering research, an increasing number of studies have been conducted to explore the cognitive development of numeracy, leading to various criticisms of Piaget's theory. For instance, studies have demonstrated that newborns and infants understand that there is invariance between number and physical transformations, even in contexts extremely similar as the one created in the number-conservation problem (Houdé-Borst, 6).

“A critical question for developmental psychologist is thus to understand why newborns and infants who have some knowledge of the relation between number and space will later on make systematic errors in the number-conservation problem until age 6 or 7.” (Houdé-Borst, 6).

This non-linear developmental pattern can be attributed to children learning various heuristics during their childhood that generally help them find solutions, except in situations where these heuristics are misleading and need to be suppressed. Adults, too, can also be found utilizing their preoperational methodologies when learning new skills or having to recount old events and information. According to this new model, cognitive development occurs in bursts with sometimes errors occurring after success in both children and adults (Kahneman, 28).

Slavin also showcases such discrepancies. At the end of the formal operational stage Piaget discusses the supposed universality of proverb correspondence. This poses some issues, especially the part that explains that “adolescents and adults have little difficulty with this task” (Slavin, 30)” without the consideration of exposure to such idiomatic expressions. Some adolescents may not understand the connotation of what it means to not “cry over spilled milk.” This is where Vygotsky does an increasingly refined of transcending the prescriptivism of Piaget’s theory on development by paying homage to the social and environmental impacts that affect development. By introducing the zone of proximity, Vygotsky allows for detraction from the purely discontinuous development model of Piaget. With children said to explore their potential through teaching moments with “adults and higher-performing peers” (Slavin, 33) and the scaffolding of information dissemination and concept instruction, it takes the burden from the generalized assertions of Piaget. Of course, just as Piaget’s discontinuous model is too prescriptive; the continuous model of Vygotsky has its flaws. First, it upholds the longstanding idea that the older members of society are inherently fit to teach than younger members of society. When it comes to the “mediation” and “cultural toolkit” that make up the basis of Vygotsky’s scholarship, there is a sense of disjunction between cultural competency and humility as the year’s progress.

Imagine that two young friends are driving together and the driver (unintentionally) screeches around a corner. The passenger notes: ‘I always slow waayyyy down when I’m turning to keep that from happening.’ This advice will ... add to the driver’s cultural toolkit... (Slavin, 34).

This example creates holes in the idea of peer-peer and elder-peer teaching development. For example, what if an older gentleman mistakenly called someone a slur and the victim corrected them on it. This may contribute to the perpetrator’s cultural competence/toolkit and promote their development, even though a younger person educated them and catalyzed such development. A hybrid continuous/discontinuous model of development that promotes a reciprocal developmental relationship between children, adolescents, and adults within the context of their family, community, and society, is one that is widely accepted in modernity and accepted for the purpose of the scope of this essay.

## Navigating the Threshold: The Social Model of Development in the Post-Covid Educational Sphere

Regardless of whether scholars prescribe to a continuous or discontinuous school of developmental scholarship, the regression due to the Covid-19 pandemic and its long-term effects is clear. Despite the most fervent efforts of school systems to amend lessons and instruction during and following the pandemic, the asynchrony and lack of infrastructure for students with special needs and financial hardships put a strain on the maintenance and growth of the intellectual and social vitality of districts and their students.

A New York Times Article by Sarah Mervosh titled *Students Are Learning Well Again. But Full Recovery? That's a Long Way Off*. Encapsulates the looming burden that is still left on districts to make up for lost instructional hours. "At this rate, elementary school students may need at least three years to catch up to where they would have been had the pandemic not happened, and middle school students may need five years or more," according to the report released on by NWEA, a non-profit organization that provides academic assessments to schools. Researchers examined the results of math and reading assessments for more than eight million students in approximately 25,000 schools. (Mervosh, 1).

The article stipulates that recovery is expected to take the longest for groups that were most affected by the pandemic, including low-income students and Black, Hispanic and Native American students. Mervosh tells us that extended remote learning was a primary driver of lost learning, widening racial and economic gaps during the pandemic. "High poverty schools tended to spend more time learning remotely, as did Black and Hispanic students" (Mervosh, 2). The pandemic thus created a paradox, the schools with less resources and ability to conduct instruction online were the schools that were advertently forced to shoulder that burden and, as a result, the success of students and families on the threshold of poverty was pushed to the wayside. But how does this relate to social and cognitive development?

Firstly, when students are seemingly removed from the lively and dynamic atmosphere of in-person school and forced into the compressed solemnity of the often-unstable home environment, they find an unprecedented lack of sociality. Under the Vygotskian schema of development, students thus face a profound lack of opportunity for cooperative learning. Vygotsky's theories endorse the use of cooperative learning strategies where children collaborate and assist each other in the learning process. "Because peers are usually operating within each other's zones of proximal development, they often provide models for each other of slightly more advanced thinking" (Slavin, 36). In addition, cooperative learning makes "children's inner speech available to others, so they can gain insight into one another's reasoning process" (Slavin, 36). That is, children benefit from hearing each other "thinking out loud," especially when their group mates talk to themselves or each other through a problem.

Of course, with the transition to distance learning, the dynamic factors that are part of cognitive and social development cease to exist. Kindergarten class on Zoom and vital arithmetic and reading lessons that encompass the formative years of a child's education become diluted. The absence of in-person motivational factors and scaffolding preclude any benefit of social and reciprocal development. As (Vygotsky) says, "Any learning a child encounters in school always has a previous history." For instance, children start learning arithmetic in school, but long before that, they have already encountered concepts of quantity and have dealt with operations like division, addition, subtraction, and size determination. It goes without saying that children have access to information available to them in their home surroundings, information that acts a primer in their social and cognitive development. However, without the exposure to the outside world, macrocosms of what children are exposed to in the home, they are largely unable to manipulate their zone of proximal development and the liminality of suppressed development is realized. This question by Vygotsky poses an interesting springboard for analysis:

*Indeed, can it be doubted that children learn speech from adults; or that, through asking questions and giving answers, children acquire a variety of information; or that, through imitating adults and through being instructed about how to act, children develop an entire repository of skills. (Vygotsky, 86).*

Clearly learning and development are interrelated from the child's very first day of life; however, most effective development involves a sense of reciprocity not just from a child and their immediate family, but also the societal and cultural imaginary that students are a member of. As Slavin mentions Urie Bronfenbrenner described a "bioecological" model of human development. "The focus of his model is on the social and institutional influences on a child's development, from family, schools, places of worship, and neighborhoods, to broader social and political influences, such as mass media and government" (Slavin, 36). The bioecological approach highlights the significance of the interconnections among various factors that affect a child's development. Therefore, distance learning and students being out of the classroom create a barrier to this dynamic system of development -- a barrier that is reflected in the quantitative data that shows significant academic regression since the beginning of Covid and the removal of environmental influence and in-person instructor scaffolding.

A further complication to the problem regarding Covid-19's impact on cognitive development is the importance of community schools and inter-agency support for children and families with little resources. In the New York Times Article: A Community School Comes of Age by David Kirp, he details of the importance of community schools beyond the bare minimum of education; these institutions are many families' opportunities out of the strata of destitution. Community schools are regular public schools "with a twist." They have longer days and longer school years: stay open 12 hours a day, six days a week, including spring and winter breaks as well as the summer.

A psychologist makes weekly rounds. A dentist comes by regularly. So does an optometrist and students who need glasses get them free? (The retailer Warby Parker donates the glasses, a good example of a public-private partnership.) Parents are ubiquitous at the school, learning computer skills, attending a "caring for the caregiver" class or picking up groceries from the food pantry. (Kirp, 3).

Kirp tells us that these practices are critical. When schools both "support academic success and social, emotional and physical health and offer a promising foundation for progress," research shows that students' reading and math scores increase, as do their chances of graduation. There is also an increased motivation to attend and a decreased tendency to act out.

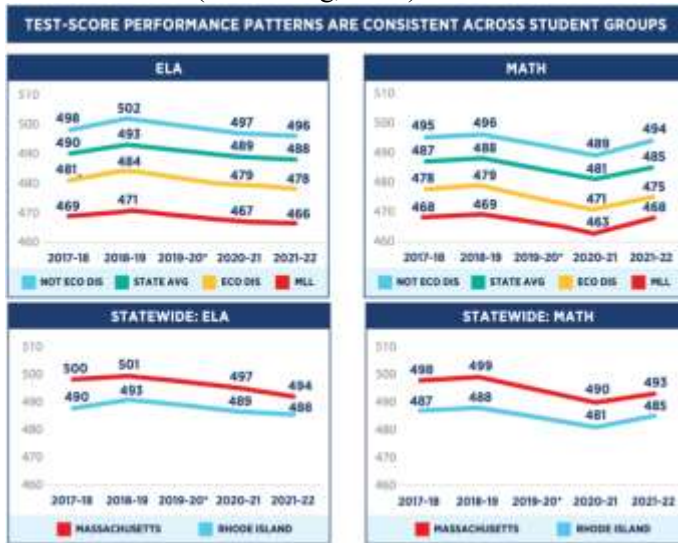
However, when these resources were halted during Covid (and continue to follow a Covid-influenced infrastructure) the motivation of students and their subsequent development were adversely affected. Without assistance from school and without getting the opportunity to focus solely on their studies, in conjunction with their lack of external stimuli, students' prospects for development are undermined.

Looking back to an aforementioned statistic: elementary school students may need at least three years to catch vs. middle school students who may need five years or more (Mervosh, 1). This presents a decoupling of developmental paradigms. Of course, elementary school students are more likely to be able to receive external help from their parent (due to a lesser difficulty of material) than their middle school counterparts, but they are more likely to face moral developmental regression which is largely based on the interaction of children and their perception of the world around them. While cognitively, middle school students may have the lower hand, elementary school students are suffering at the expense of their moral outlook. This is further complicated on the lines of race and class and, needless to say, provides a multifaceted threat to districts that were already struggling to meet academic and social standards.

As a final remark, I would like to look at a report by the Annenberg Institute of School Reform at Brown University titled *The State of Recovery: Rhode Island's Post Pandemic School Landscape* as a case study to corroborate this essay's previous assertions. "The past five years have brought tremendous upheaval to Rhode Island schools" (Annenberg, 2023). The Covid-19 pandemic has had dramatic effects on education across the state and the nation. Long-existing concerns of racial inequity and inequality were visibilized in the wake of George Floyd's murder. That year, a report from Johns Hopkins University exposed the grave state of public education in Providence. This report compelled the Rhode Island Department of Education to take control of the school district and such intervention, and its effects remain the central imperative of educational discourse in the state. The Annenberg report reveals that as Rhode Island recovers from the pandemic, schools encounter multiple challenges, including widespread concerns about student mental health and well-being,

significant learning recovery needs, a tight educator labor market with staff shortages, and an evolving economy that increasingly demands skills and advanced credentials for success.

For the purpose of this essay’s scope, cognitive development, I will focus on the section of the report that deals with performance on state and national standardized testing and assessment. During the pandemic, student RICAS (Rhode Island Comprehensive Assessment System) scores fell in both mathematics and ELA, although mathematics performance rebounded in 2021-22. “Encouragingly, the performance gaps between students from different backgrounds have not widened in the state, despite the pandemic’s disproportionate impacts on students of color and students living in poverty” (Annenberg 2023). However, student academic performance in Rhode Island remains “soberingly low”. Rhode Island performs below national average in mathematics according to the National Assessment of Educational Progress (NAEP), a ranking which remains stagnant over previous years of assessment. When we compare schools in Rhode Island to “demographically similar schools in Massachusetts”, we see quite large performance gaps across all types of schools: “higher-income RI schools lag well behind similarly-resourced schools in Massachusetts” (Annenberg, 2023).



Figures 1 to 2: RICAS Average Scaled Scores by Student Characteristics, 2017-18 to 2021-22

Figures 3 to 4: MCAS/RICAS Average Scaled Scores, All Schools

Key: MLL = Multilingual Learner, EcoDis = Economically Disadvantaged \*\*RICAS was not offered in 2019-2020 (Annenberg, 2023).

Clearly there is a systemic problem in Rhode Island concerning pedagogical priorities that render Rhode Island trailing behind its neighboring states in terms of academic achievement. As the graph series above illustrates, mathematics performance faced a significant decline in 2020-21 before rebounding in the following school year to close to pre-pandemic levels. ELA, however, has seen a continued decline in achievement as evidenced by the proficiency level dropping from 39% to 33% from the 2018-19 to 2020-21 school years.

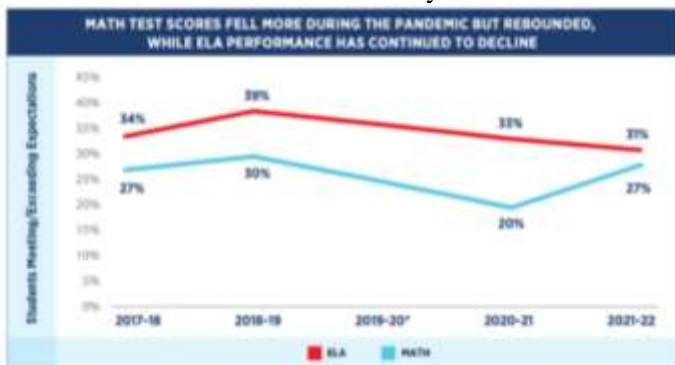


Figure 5: RICAS Performance 2017-18 to 2021-22 (Annenberg, 2023)

It is clear that students and the state as a whole are facing educational and cognitive delays that render the state only having roughly 30% of its students proficient in math and ELA. Due to the lack of resources in many schools, regardless of average income, as well as distance learning, there is a clear disconnect between students’ developmental “milestones” and where students are currently placed.

Due to the moral and motivational/social aspect of development, it is beneficial to take a look at another pertinent statistic that was included in the Annenberg report: “Chronic absenteeism has risen to all-time highs following the COVID-19 pandemic” (Annenberg 2023). In addition to the change in student performance statewide, students are attending school at unprecedentedly low levels. These challenges demonstrate the significant and enduring effects of the pandemic on students' well-being, development, and their connection to schooling. There will be a tendency for students to withdraw and isolate themselves rather than interact with their peers or engage in school activities. This cycle of isolation, initially caused by COVID-19 and subsequently leading to chronic absenteeism, will place them at a disadvantage.

According to the Annenberg report, “Attendance declines have been particularly dramatic for RI elementary schoolers — the share of chronically absent elementary school students more than doubled as evidenced in the data, elementary school students now have absenteeism rates on par with high school students a few years ago” (Annenberg 2023). The see similar patterns across lines of difference, with absenteeism rates increasing for students from all racial/ethnic backgrounds.

It is also worth noting that Rhode Island has a population of about 1 million and 200,000 live in Providence, a historically marginalized and low-income community. This concentration of marginalized data might skew the statewide data surrounding progression or regression.

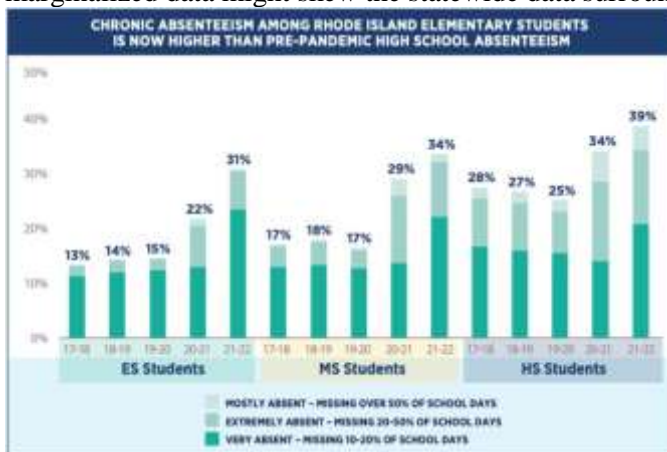


Figure 7: Chronic Absenteeism in Rhode Island by Absenteeism Level and School Level, 2017-18 to 2021-22. (Annenberg, 2023).

Due to lower test scores on RICAS, and increasing chronic absenteeism among elementary school students, the post-Covid picture of development is grim. It is important that Rhode Island, as a sister state to states with larger educational success and post-Covid rebound (Massachusetts), learn to make a more concerted effort to remodeling the developmental infrastructure for its students, especially students that have become derailed cognitively and motivationally by the trauma of the Covid-19 pandemic.

**Looking to the Future**

It is important that we understand and redress the potential moral and cognitive regression of students that missed vital periods of proximal development. As educators and people who have lived through the ebbs and flows of pedagogy in relation to cultural context and the tone of the era, the importance of social components to development is one that cannot be understated. This paper’s most fervent mission was to prove the validity of environment-centered development and the importance of Vygotskian principles of scaffolding and cooperative learning, in conjunction with the ideals of bioecological development.

The aftermath of the pandemic has unveiled major issues in the moral and cognitive development of students as evidenced by the decline of test-scores and classroom attendance. This

statistic is all the more frightening when it concerns preschoolers and elementary school students, the population with the most ever-changing cognitive and moral development patterns. Preschool and elementary school students need socialization in order to learn how to work as part of a group, as well as benefit from Vygotskian mediation and cooperative learning practices. Therefore, to accommodate such disruptions from the pandemic, preschool and elementary school teachers need to especially emphasize the integration of social components to lesson plans. Whether this involves letter relay races, shape games that involve partner work, or doing group arts and crafts is up to the instructor, but it is of paramount importance that students are able to make up for the lack of socialization that they would have been exposed to in their pre-pandemic sensorimotor / preoperational stages of development.

Outside of the classroom, educators and policymakers need to adopt long-term solutions to bridge the educational divide. As Covid-19 federal relief money must be spent by September of 2024, schools need to be prepared to navigate the threshold of promotion of new knowledge, and revisitation of what was lost amidst the pandemic's profound uncertainty.

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