

**The Risks and Opportunities of the COVID-19 Crisis for Building Longitudinal Evidence  
on Today's Early Childhood Education Programs**

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Risks and Opportunities for Building Longitudinal Evidence**

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## **Abstract**

In the United States, the long-term effects of early childhood programs have been given particular weight in research on early childhood education and in policy debates about the value of prekindergarten. Many research teams were building the evidence base on U.S. early childhood programs to inform that discussion when studies were upended by the COVID-19 pandemic. In this article, we describe the theoretical and practical risks the COVID-19 pandemic poses for longitudinal studies of preschool intervention programs. We also discuss the potential opportunities the crisis offers by introducing new variation in postprogram experiences for addressing new questions. The article intersects the resilience and disaster literatures with theoretical frameworks for the persistence of preschool effects. We conclude with recommendations for how longitudinal studies of cohorts affected by COVID-19 can enhance our understanding of the mechanisms behind the persistence of preschool effects.

Keywords: COVID-19, longitudinal impacts, interventions

Education researchers and the public have sought to understand the longitudinal impacts on adults of preschool to 12<sup>th</sup>-grade education programs to determine whether the learning that occurs in school can transform adult lives in important ways. This has been especially the case

with preschool programs, where early findings of sustained benefits into adulthood (Phillips et al., 2017a) have captivated the public's attention to the value of early learning, even when the gains faded in middle childhood.

Before the COVID-19 pandemic, multiple research teams were building the requisite longitudinal evidence to understand whether these patterns held for U.S. preschool programs today. Their work sought to understand how differences in the programmatic approaches, counterfactual experiences, demographic characteristics, and parental investments in children's development might strengthen (or weaken) these longitudinal effects (Bailey et al., 2017). But COVID-19 upended these studies, even those for which data collection was not formally disrupted.

The central challenge is that longitudinal theories of change never included sustaining effects through a global public health crisis, one that has markedly increased family stressors, amplified the effects of poverty, and resulted in greater trauma and loss on the part of children as well as drastically widened inequality (Weiland et al., 2021). Among the questions that arise are: What does the most recent generation of studies tell us about the effects of a given program in the time of COVID-19? What is the generalizability of these findings to later and earlier cohorts? Finally, and perhaps most importantly, how do we take advantage of variation in intervention approaches along with timing and extent of COVID-19 exposure to offer the field new insights into those programs that can best promote children's development and resilience?

In this article, we use research on preschool interventions as an anchor to describe the theoretical and practical risks posed by the COVID-19 pandemic for longitudinal studies of education programs. We also discuss the potential opportunities the crisis offers, by introducing new variation and addressing new questions. In doing so, we offer a framework for interpreting the longitudinal effects of a new generation of preschool programs. Our goal is to spark a new research agenda for the preschool education field following this global pandemic.

### **Recent Preschool Research in the United States**

Since the 1960s, researchers have conducted more than 60 rigorous evaluations of U.S. preschool programs and across the studies, the findings are clear: Compared with other care alternatives, attending preschool better prepares children for kindergarten (Phillips et al., 2017a). However, since the beginning of Head Start in the 1960s, there have been questions about how

long the benefits of preschool persist. In the older literature, the language, literacy, and mathematics test scores of preschool participants and nonparticipants tended to converge partially or completely by about third grade (Phillips et al., 2017a). But in the long run, preschool participants seemed to outperform nonparticipants on a range of behavioral, health, and educational outcomes into adulthood.

Evidence from more recent, scaled-up U.S. programs mirrors these patterns through the medium term, though experts recently concluded that such evidence “is sparse, precluding broad conclusions” (Phillips et al., 2017a, p. 9). To address this gap, researchers have been tracking children in these more recent, scaled-up programs. Some samples show no evidence of persistence of benefits beyond kindergarten on outcomes like grade retention, special education placement, and tests (Puma et al., 2012; Weiland et al., 2020). Others show evidence of small lasting benefits on these same outcomes in early elementary school (Ladd et al., 2014) and middle school (Gormley et al., 2018). In one study that examined participants through age 28, benefits included high rates of graduation, taking the SAT, college enrollment, and discipline (Gray-Lobe et al., 2021). Notably, these recent samples are quite diverse in terms of family income, race/ethnicity, dual language, and special needs status, and certainly more diverse than studies of older cohorts (Phillips, 2017b).

Researchers have applied multiple theoretical frameworks to explain the persistence (or lack thereof) of the preschool effect. For example, from economics, the human capital accumulation theory holds that a strong early foundation sets the stage for acquiring more advanced skills (Heckman, 2000). From developmental psychology, developmental cascades models describe how earlier experiences have different probabilities for subsequent outcomes and in different domains (Masten & Cicchetti, 2010). Another theory (Bailey et al., 2017) built on these and other theories to posit that persistent effects may depend on the continuity of children’s experiences during and after preschool, and whether preschool gets children over an important hurdle to access another subsequent program (or avoid less desirable ones, offering a foot in the door). This theory also suggests that persistence depends on whether the skills targeted by the preschool program have three key characteristics: they are malleable, fundamental for success, and unlikely to develop in the counterfactual. As we discuss, these dimensions likely need to be adapted for the context of COVID-19.

Drawing on these and other theories, researchers have been building empirical evidence on the mechanisms behind lasting versus fading impacts of today's preschool programs, with mixed results. For example, in recent studies, preschool effects were more likely to be sustained if students subsequently experienced higher-quality early elementary school environments, as measured by factors like spending (Johnson & Jackson, 2019), school-level third-grade test scores (Unterman & Weiland, 2020), and alignment between preschool and kindergarten curricula (Mattera et al., 2018). However, other studies that examined numerous kindergarten classroom features found largely null results (e.g., Jenkins et al., 2018). Accordingly, we lack clarity on which theory best explains the persistence of preschool effects. Prior to COVID-19, the hope was that information from additional studies might help parse these divergent findings. In the context of COVID-19, different cohorts of children will experience differences in their preschool versus early grade experiences that may either provide traction to answer some of these longstanding questions or disrupt opportunities for answering them.

### **The Effects of COVID-19 on Families and Children**

The effects of the COVID-19 pandemic on families and children have been multisystemic, profound, and unequal. Many parents have fallen ill, some with lingering, debilitating symptoms, and many others have died (Kidman et al., 2021). Black and Latino communities and communities with low incomes have had the highest incidences of COVID-19 and the highest age-adjusted mortality rates (resulting in loss of a family member for many children; Sehra et al., 2020). Broadly, even for those who have not contracted the virus, the COVID-19 crisis has brought considerable financial and psychological strain, particularly for families with low incomes (Gassman-Pines et al., 2020) and for Asian-American families amid the spike in Asian hate (Lee & Waters, 2021).

Nationally, prekindergarten and kindergarten enrollment has dropped substantially. Children who are enrolled have had substantially different experiences than children who were enrolled in these programs before the pandemic, and these new experiences may have muted early learning gains (Weiland et al., 2021). K-12 students who are participants in current preschool followup research spent a year or more out of their school buildings. The overarching story for them has also been one of exacerbated inequality, as exemplified by data on larger learning setbacks for children of color and in geographical areas that experienced the highest job

losses (Kogan & Lavertu, 2021). How long these effects will persist is unknown, given new variants emerging around the globe and the uneven rollout and takeup of vaccines. Moreover, we know little about how public entities will invest to mitigate these effects through efforts like extended school years, comprehensive after-school programs, tutoring, and summer learning initiatives.

Past crises offer cause for both optimism and deep concern. A large body of resilience science has grown over the last five decades. These studies emerged initially as a result of efforts to understand and prevent psychopathology, then turned to addressing questions about how children fare following war and violence, technological and natural disasters, and traumatic early childhood experiences (Luthar, 2006; Masten, 2014; Rutter, 1987; Ungar, 2021). Somewhat surprisingly, risks, responses, and approaches to supporting children's well-being across very different experiences align considerably (Masten & Motti-Stefanidi, 2020). Resilience science highlights the ways children's responses to a crisis are likely to depend on four factors: 1) dose of exposure to the traumatic event (with those with greater personal exposure to death, trauma, or loss more likely to be affected); 2) developmental timing; 3) individual differences in prior skills (Masten, 2018), prior trauma experiences (Osofsky, 2004), and biological sensitivity to the environment (Boyce & Ellis, 2005); and 4) the context before, during, and after the disaster, with greater challenges in the context of previous risk (e.g., the tsunami in Sri Lanka; Catani et al., 2008) and when recovery is prolonged (e.g., Puerto Rico; Orengo-Aguayo et al., 2019).

This resilience work offers optimism for the likelihood that adaptive systems emerge to support resilience to crises, including in a multisystem disaster like COVID-19. In particular, schools can play important roles in supporting children following crises (Masten et al., 2021; Ungar et al., 2019). They offer the potential for regular routines (if open on a consistent, predictable schedule); resources to which families may not otherwise have access; peers and adults that extend children's social relationships; and the opportunity in some cases to nurture resilience skills like self-regulation, self-efficacy, and optimism for the future. Family cohesion and parent management skills, too, can offset the risks of communitywide traumatic events (Masten & Palmer, 2019). In fact, in a consensus statement, experts suggest that "five essential elements of immediate and mid-term trauma intervention" are 1) a sense of safety, 2) calming, 3) self-efficacy and collective efficacy, 4) connectedness, and 5) hope (Hobfoll et al., 2007). As we

discuss next, researchers should study these elements to understand the longitudinal effects of preschool during COVID-19.

### **The Intersection of COVID-19 and Preschool Research: Risks and Opportunities**

The disruptions of the COVID-19 pandemic to ongoing research on the longitudinal effects of preschool have been profound. Studies that were using direct assessments to determine impacts at a given followup point were effectively brought to a halt. Virtually all U.S. localities halted standardized testing in spring 2020 and administrative testing decisions varied across and within states in 2020-2021, which affected researchers studying children through administrative records. In schools that administered tests, some have done so via remote methods, with children taking tests via modalities that studies tell us do not result in valid, reliable scores. These disruptions may continue in 2021-2022 due to the Omicron variant.

Even for studies that experienced more minimal disruptions, the theory of change of preschool interventions never included lasting through a pandemic as disruptive as this one, with all the deleterious effects on family stress, income, schooling, and health we have outlined. Accordingly, how should the findings of ongoing preschool longitudinal studies be interpreted? Do negative findings indicate that a given preschool program had iatrogenic effects on participants that are generalizable to non-COVID-19 periods? Did preschool-induced impacts interact with children's pandemic experiences in unexpected ways? Do positive findings suggest that preschool programs somehow made children more resilient to cope with the adversity of a public health disruption like COVID-19?

The field needs to consider these questions carefully before interpreting findings from longitudinal preschool studies. COVID-19-related disruptions to preschool studies and to study participants' lives merit revisiting preregistered hypotheses. They also merit including measures of prepandemic and pandemic-related experiences to test competing hypotheses about findings that emerge, as well as potentially merging data and synthesizing findings across studies to compare and consider converging and diverging patterns.

If both the preschool fadeout literature and the resilience literature are considered simultaneously, we suggest several exemplary hypotheses in reformulating expectations about long-term impacts of preschool interventions in the wake of COVID-19. First, for preschool programs where impacts were small and where differences observed in preschool had not



resulted in dramatically different trajectories of children's learning experiences (i.e., studies in which the preschool intervention ended just as COVID-19 began), we might expect that the postpreschool COVID-19 schooling experience was so disruptive to both treatment and control groups as to eliminate any chance of long-term impacts. Second, long-term gains come from trifecta skills that are malleable, fundamental to success, and unlikely to develop in the context of the counterfactual (Bailey et al., 2017); a resilience framework may lead us to expect continued gains only for those programs that support skills fundamental to adaptation in the context of COVID-19. Third, theory from resilience research (Masten et al., 2021) points to self-regulation and social-emotional skills as especially effective in supporting children through difficulties like COVID-19, skills that can be but are not always fostered in preschool programs (e.g., Morris et al., 2014; Weiland & Yoshikawa, 2013). Thus, we may expect sustained effects for programs that fostered such skills successfully.

Fourth, impacts also may be more likely to be maintained for young children who attended preschool programs that focused on deeper thinking and problem solving (McCormick et al., 2021), skills that are not only fundamental and malleable, but especially unlikely to develop in the counterfactual during the pandemic given the limits of remote learning. Finally, programs that have built longstanding relations between schools and families (e.g., ParentCorps; Brotman et al., 2016) might also support resilience in children post-COVID-19 because they contribute to the development of adaptive, interconnected systems (family and school) that are so central in the context of mass trauma experiences.

But beyond taking care in interpreting results and revisiting hypotheses before analyses, because of the increased variation in postpreschool experiences, the pandemic offers opportunities for addressing questions about whether and how children's postpreschool experiences matter for sustaining the preschool boost. For example, in some areas of the United States, schools were open five days a week for virtually all of the 2020-2021 school year (Weiland et al., 2021), though some families chose to keep their children home. In other districts, schools offered only remote classes for all of 2020-2021, increasing the importance of the role of the home environment and family for supporting children's learning. Carefully documenting children's learning experiences (in terms of modality but also the volatility and quality of those experiences) before, during, and following COVID-19 lockdowns may offer the opportunity to

further test and build theory and empirical evidence on the importance of postpreschool experiences.

Cohorts of children in many longitudinal studies of preschool effects were in different developmental periods when the pandemic began. For example, children in the Institute of Education Sciences-funded Early Learning Network studies (Early Learning Network, n.d.), the Tulsa Study of School Experiences and Early Development (SEED) study (Johnson et al., 2021), and the Harvard Early Learning Study (Jones et al., 2020) were in early elementary school. Children in the Boston Prekindergarten followup study (Weiland et al., 2020) were in grades 8-11, while children in the North Carolina prekindergarten studies were in early adulthood (Bai et al., 2020). These studies differ in terms of the richness of data collected before and during the pandemic (and, we expect, will differ afterwards as well). They also differ in terms of the diversity of their samples and program enrollment criteria, though collectively, their samples are considerably diverse in terms of income, race/ethnicity, and linguistics. Analysis across samples in different developmental periods both within the same study and across studies may offer new insights into why preschool effects sometimes persist and sometimes do not. Differences in the targets and impacts of these programs during preschool and postpandemic family and community experiences and vulnerabilities could also enrich our understanding of mechanisms. While resilience research has examined promising approaches to recovery following mass trauma, we know little about variation in recovery from pretrauma intervention approaches that may buffer against risk after trauma.

Funders are recognizing that such work is critical for moving forward after the pandemic. For example, the National Institutes of Health's recent Notice of Special Interest for studying the effect of returning to school across varied learning conditions offers funding for these kinds of opportunities. Such efforts will most likely lead to learning if common constructs are collected across study teams, including measures of COVID-19 exposure at the individual and community levels, and if funding is provided for synthetic reviews and, where possible, pooling of this research.

To that end, drawing from research on disaster and resilience, researchers should collect information on the online, in-person, and hybrid school experiences and engagement of both intervention and control groups of children during the pandemic. Such information can help us understand which academic experiences may have buffered children against risk and supported

resilience during the most challenging periods of the COVID-19 pandemic. This includes information on instructional content and practices, as well as practices to support social-emotional learning and the regular routines of schooling. Information should also be collected on families' and communities' exposure to the most harmful risks of COVID-19, such as death, job loss, structural racism and discrimination, financial insecurity, housing changes, and stress. This will allow us to document the extent to which impacts may vary across places and people who are affected differentially by COVID-19 (consistent with research on dose effects of disasters). Information on the quality of parent-child relationships and family cohesion, where available, would add to our understanding of family-level protective factors, as would measures of the aforementioned five essential elements of immediate and midterm trauma intervention (Hobfoll et al., 2007).

Finally, given the unequal effects of the pandemic, we must pay careful attention to the experiences of important subgroups, including children of color, children from families with low incomes, children with disabilities, and children experiencing bereavement (Weiland et al., 2021). We also should focus on community differences, such as neighborhood rates of exposure to COVID-19, job loss, and communitywide adaptive responses to the pandemic. The literature on preschool intervention suggests that some student subgroups benefit more than others (Phillips et al., 2017a), yet the reasons why are unclear. We may need to oversample these students in followup studies, and combine data sets across communities to have enough statistical power and to test for variation to capture their experiences and learn about differences in resilience factors across people and places. We may learn as much from person-level variation as from site-level variation in unpacking variation in the persistence of preschool impacts.

### **Conclusion**

In his groundbreaking work, *Children of the Great Depression* (2018), Glen Elder documented both that historical change experienced in childhood could profoundly affect human development and that subsequent life-course experiences can contribute to resilience. Likewise, work on the children of the COVID-19 pandemic that further builds our understanding of the complicated interplay between earlier and later life experiences (including the role of pre-COVID randomized intervention) stands to advance the field's understanding of developmental mechanisms and trajectories. Although it remains to be seen whether ongoing longitudinal

studies of U.S. preschool programs can provide us with the long-term evidence we need on today's programs, the field has ample opportunity to build theory and understanding of the mechanisms of these programs from the developmental disruption wrought by the COVID-19 crisis.

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