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Some Assembly Required
Piecing Together the Preparation Preschool Teachers Need

A Resource for **Policymakers** and **Advocates**

National Council on Teacher Quality

Preschool Preparation Chaos

Recent years have seen a steady push for expanding access to preschool education — local, state, and federal policymakers; presidential hopefuls; and even celebrities[1] have jumped on the universal preschool bandwagon.[2]

While the goal of giving every child a great start for school and life is incontrovertible, achieving this outcome would require much more than expanding access to preschool classrooms. Some of the strongest evidence in support of preschool is based on decades-old research about programs with intensive supports rarely available in a typical preschool.[3] Since then, new studies have cast doubt on the staying power of the preschool advantage: some studies find lasting benefits, while others find the effects fade within a few years — or even leave children worse off than their non-preschool-attending peers.[4]

We suspect teachers are the determining factor in either creating a successful preschool experience or presiding over a squandered opportunity. And yet, despite the seminal role of teachers, little is known about the best approaches to training aspiring preschool teachers. Even defining qualifications for a preschool teacher is fraught with complications.

Chaos in training requirements

NCTQ's past work has revealed wide variation in minimum requirements for K-12 teachers, e.g. different certification grade spans, inconsistent course requirements, variable subject knowledge demands. But, amidst this maze, there have at least always been a few baseline expectations for all teachers, such as having a bachelor's degree. In preschool, the regulations do not approach even this level of consistency, especially since preschool programs can be run and funded at the federal, state, or local level — each of which may have its own requirements.

The federal Head Start program funds local programs that serve a million children a year spread across every state and territory in the country.

- As of September 2013, the Head Start program required that at least half of all Head Start teachers nationwide have at least a bachelor's degree in early childhood or a related major.[5] Because this benchmark is set at the national level, some Head Start centers may be staffed only by teachers with bachelor's degrees, while other centers may have no teachers with this qualification.[6]

Many states fund their own preschool programs.[7]

- All but nine states offer some state-funded preschool programs, but these all have different criteria for teachers.
  - 33 state-funded programs in 27 states require all teachers to have a bachelor's degree.
  - 12 programs in 10 states require an associate's degree, Child Development Associate's (CDA), or similar.[8]
  - 12 programs in 10 states require a bachelor's degree for teachers in public settings but not for teachers

in non-public settings (even those non-public settings that receive public funding), where teachers may only need an associate's degree, CDA, or high school diploma.

- And it gets messier.
  - Some states, like Kansas, require that teachers have a bachelor's degree but not necessarily an early childhood specialization.[9]
  - Some states, including Delaware, Ohio, and Washington, require early childhood specialization but not a bachelor's degree.
  - In Florida, requirements depend on whether the teacher works during the summer (must have a bachelor's) or during the school year (a CDA or equivalent).
  - In Kentucky, teachers must have a bachelor's degree unless they have been teaching since before the 2004-2005 school year — then they're grandfathered in.
  - Pennsylvania boasts four different state-funded preschool programs. Two require a bachelor's, but only one of these requires specialization in early childhood. The third requires an associate's degree, and the fourth requires a bachelor's for those in public settings and an associate's for those teaching in non-public settings.

Within many states, school districts and private entities have their own preschool programs with their own requirements.

- In Denver, Colorado, teachers in district-run schools must have a bachelor's degree and a teaching license, but teachers in the community-run schools follow any of eight different training paths laid out by the Department of Human Services. In Colorado's state-run programs, teachers are required only to have a CDA.[10]
- In California's state-run programs, teachers must have a CDA. In San Francisco, preschool teachers only need about 12 credits of college or lower-division coursework and a teaching permit, usually obtained through a community college. Despite the low requirements, 85 percent of San Francisco's lead preschool teachers do have a bachelor's degree, although the city does not have any systematic salary increase for having a higher degree.[11]

These variations on what it means to be a qualified preschool teacher suggest that aspiring teachers will face difficulty determining what training they need in order to teach. Also, to the extent that these criteria impact the quality of instruction, equitable access to quality preschool is unlikely.

Preschool teachers need solid training — not empty credentials

Beyond the maze of preschool teacher requirements lie grim economic realities: Preschool teachers often earn low salaries[12] and do not receive the professional respect they deserve.[13] This low status persists despite the fact that preschools are expected to instill academic and social skills. However, some policymakers fear that raising the bar for preschool teacher qualifications — a step that could ultimately increase pay and prestige in the profession — could result in an immediate teacher shortage, halt movement toward greater preschool access, and possibly not greatly impact preschooler learning.

Research indicates that simply having more credentialed preschool teachers is not the answer. The current "gold standard," as put forth by the National Academies and the National Institute for Early Education Research,[14] is that high-quality preschool teachers should have at least a bachelor's degree — even though the research does

not always support this policy.[15] Instead, NCTQ asserts that the real answer lies in meaningful coursework and fieldwork that is part of the credentialing process for teachers regardless of their path into teaching.

What training should preschool teachers have? Do bachelor's and master's degree programs, often thought to be the hallmark of meaningful preschool teacher preparation, provide that training? NCTQ's study builds upon the foundation of past preschool teacher prep evaluations[16] to provide more detailed insight into what these programs offer. As we lay out in the work that follows, our review of these programs shows little evidence of quality training focused on the needs of the preschool classroom. With critical changes in course requirements and evalua-tion during student teaching, however, NCTQ believes that preparation programs could produce teachers ready to set preschool children on a trajectory for success.

The essentials: What preschool teacher prep programs *should* do and what they *actually* do

Programs that take responsibility for training preschool teachers must instill in them a wide array of skills and knowledge *and* provide adequate practice working with young children. This analysis focuses on a selection of the requisite skills and knowledge which are supported by strong research and require targeted training to learn and implement proficiently.

The focus areas include: developing children's language ability, building a foundation for reading through emergent literacy skills and read-alouds, introducing emergent math, creating an inviting classroom environment, and honing skills through student teaching. The analysis is based on a sample of 100 preparation programs that certify preschool teachers, including five associate's degree programs, 54 bachelor's degree programs, and 41 master's degree programs.

Many experts agree that science and social studies instruction are also important, but less information exists on what teachers should learn about how to teach these subjects. Other essential skills that are not analyzed here include engaging families, maintaining classroom safety, and supporting diverse learners.

Developing children's language ability and building a foundation for reading

What is language development and why is it important?

Developing children's language skills is important in and of itself, but it is also the key that opens the door to so many areas of learning for children. Many children entering preschool are hindered by a language deficit: By the age of four, an economically advantaged child may have heard as many as 45 million utterances and be well along the path to literacy, and to academic and social success. If economically disadvantaged, the child may have heard 30 million fewer utterances and be falling far behind.[17] The gap in oral language plays out along racial lines as well as socioeconomic ones, and puts children at risk for "future academic and social difficulties."[18]

Especially for young children who are already behind, preschool teachers can play a critical role in language development. It is imperative that preschool teachers have the skills to develop children's ability to communicate.[19] Unfortunately, most preschool teachers do not naturally engage in these practices.[20] However, intensive and focused training can help teachers make big strides.[21]

FINDINGS

- *Only 59 percent of preschool teacher prep programs require candidates to take a course that addresses developing preschool children's language development.*
- *Many programs fail to evaluate whether student teachers can develop children's language ability in key areas like building vocabulary (only 8 percent of programs evaluate this), providing opportunities for children to talk (28 percent of programs), and asking children questions (60 percent of programs).*

What is emergent literacy and why is it important?

Emergent literacy encompasses a range of skills that are essential to reading, but may not come naturally to all children. These skills include phonological awareness (the ability to detect or manipulate the sounds in words, such as syllables and rhymes),[22] phonemic awareness (a subset of phonological awareness relating to the sounds of letters), learning the alphabet, and concepts of print (such as title, author, text direction, and turning pages in a book).[23] Teacher training in these areas can translate into substantial gains for children in alphabet knowledge, vocabulary, and language skills.[24]

The early introduction of language and literacy can make a lasting difference for children. Unsurprisingly, children with low language and literacy skills in preschool demonstrate lower reading skills in kindergarten.[25] However, not all approaches to teaching emergent literacy are equally effective, and the quality of preschool curricula varies, making it that much more important that preschool teachers have ample training in how to develop their preschoolers' emergent literacy skills.[26]

FINDINGS

- *While literacy is an essential skill for ALL children, only 73 percent of preschool teacher prep programs require candidates to take a course that addresses building preschool children's foundation for reading.*
- *Prep programs' required courses do not always teach key skills: 62 percent of programs teach about building children's understanding of the sounds of words or letters and 44 percent teach about developing children's alphabetic knowledge.*

What are read-alouds and why are they important?

Reading to a child is a powerful experience that builds an emotional bond, teaches new words and ideas, and introduces information about the wider world. Using read-alouds effectively can boost literacy skills for years to come, and can improve children's vocabulary and other language skills.[27]

FINDINGS

- *Only 20 percent of programs teach about and expect candidates to practice reading aloud to children.*

What is emergent mathematics and why is it important?

Young children can do much more mathematically than count to three and identify basic shapes. Introducing children to more complex mathematical concepts from an early age may increase their math ability in later years.[28] In fact, some research suggests that the relationship between children's early math skills and future math achievement is twice as strong as the relationship between emergent literacy and future reading achievement.[29]

Teachers should build children's number sense and understanding of numerals' spatial position on a number line,[30] as well as patterns, measurement, and geometric concepts.[31] Teachers should also teach children to measure objects using formal instruments like rulers and informal instruments like the length of their arms.[32]

FINDINGS

- *Only 40 percent of programs require a math course that clearly addresses teaching preschool.*

What should teachers do to create an inviting classroom environment?

Maintaining a positive, developmentally appropriate preschool classroom environment is no easy feat — and yet it is critically important. As evident from the reported behavioral problems of children in kindergarten and entering Head Start, as well as the high suspension and expulsion rate for preschool children, teaching appropriate behavior poses a challenge for many preschool teachers.[33] Teachers need substantive training and practice with effective classroom management strategies that can build social-emotional skills and prevent or resolve many behavioral problems.[34]

Of course, classroom management is about more than discipline: it is about establishing an environment that actively supports learning.[35] Teachers' emotional support for their students is associated with better social competence and lower rates of behavior problems.[36]

FINDINGS

- *Only one in five programs (19 percent) ensures that student teachers know what to do when a child acts out or disrupts the classroom.*
- *Only a quarter of programs (26 percent) evaluate student teachers on using positive reinforcement — even though this strategy is backed by a wealth of evidence.*
- *Preschool children often learn through play or activity centers — but only 36 percent of programs evaluate student teachers on managing these activities.*

What are the hallmarks of an effective student teaching experience for a preschool teacher?

The importance of student teaching is undisputed.[37] Student teaching offers the potential for teacher candidates to build skills related to instruction, classroom management, family engagement, and more. A bad experience can instead instill counterproductive techniques, or even worse, quash the candidate's excitement about teaching.

Teacher candidates gain the most from their student teaching experiences when those experiences require frequent observations by a university supervisor who can give them ongoing feedback about their strengths and areas for growth.[38] Great placements should also pair teacher candidates with a cooperating teacher who is both a good mentor and an effective teacher from whom the candidate can learn, last long enough for the student teacher to gain a wealth of firsthand classroom experience,[39] and give the candidate an opportunity to practice with the age group she plans to teach.[40]

FINDINGS

- *Most programs (80 percent) give candidates the option to student teach in a preschool setting.*
- *Only half of programs (52 percent) make sure student teachers are observed at least four times by their university supervisor — even though the research says they need even more frequent observations.*
- *Only 5 percent of programs make sure to pair student teachers with effective classroom teachers.*

Policy Recommendations

For all states and districts:

- Create centralized information about the different pathways available to earn credentials to teach preschool and in what settings each credential allows people to teach (e.g., in what settings an individual with a bachelor's degree versus an associate's degree can teach).
- Clarify the pay structures for any publicly-funded preschool programs. When there is a state or a local salary schedule, there is no justification for school districts to pay preschool teachers less than K-12 public school teachers.

For states and districts that require preschool teachers to have a bachelor's degree and preschool teacher certification:

Examine the quality of the available teacher preparation programs to ensure they give adequate attention to the needs of preschool teachers.

- Encourage programs to offer either a more focused degree or an add-on endorsement targeted to teaching young children. Teacher prep programs that focus more on lower grades (e.g., preschool through grade two) tend to provide training that is more relevant to teaching preschool. In general, the more grades a program covers, the less likely it is to prepare teachers well in any particular grade span.
- Require that programs certifying teachers for preschool give them the option of student teaching in a preschool (with the caveats that the preschool must be high-performing and the cooperating teacher must be effective).
- Ensure that all programs require coursework in areas including (1) developing children's language skills, (2) building a foundation for reading (known as "emergent literacy"), (3) introducing math and science, and (4) understanding early childhood development with a focus on early years (e.g., birth to age eight).

For states and districts that do not require preschool teacher certification:

Preschool programs for 3 and 4 year olds are expected to provide learning experiences that prepare children for kindergarten. Given this expectation, preschool teachers need to have specialized training through whatever mechanisms are available. For example, just as preschool teachers must submit to a background check, CPR training, and child abuse prevention training, so too should they show evidence of basic training in key areas.

- Require that teachers take a course or online training in building children's language skills. Teachers should also have training in introducing math and literacy to preschool-age children, and a child development course with a focus on the early years (e.g., birth to age eight).

- Require that teachers conduct an apprenticeship in a high-quality preschool in which they not only observe the teacher and interact with children, but also teach and receive feedback on lessons.
- Do not assume that current credentialing routes that do not involve a higher education degree are adequate. Because coursework requirements for some credentials (such as the Child Development Associate's, or CDA) are very flexible, they provide no guarantee that teachers have learned essential skills and content.

Endnotes

1 Capehart, J. (2011, June 15). The pieces to a national strategy for kids. *The Washington Post*. Retrieved from https://www.washingtonpost.com/blogs/post-partisan/post/the-pieces-to-a-national-strategy-for-kids/2011/03/04/AGOdFtVH_blog.html

2 For the purpose of this study, we are defining preschool as "formal, center-based program for children 3 and 4 year olds."

3 The two best-known are the Abecedarian Project and the Perry Preschool Project:

- The Abecedarian Project, serving children from infancy through kindergarten entry, provided full-day, year-round service and included on-site health services. Research on the Abecedarian Project followed 111 children into their 30s and found that children who had attended preschool had higher IQ scores (up to age 15), were more likely to hold bachelor's degrees and jobs, and had lower risk of coronary heart disease at age 35. Campbell F., Conti, G., Heckman, J.J., Moon, S.H., Pinto, R., Pungello, E., Pan, Y. (2014, March 28) Early childhood investments substantially boost adult health. *Science, 343*(6178):1478-85. DOI: 10.1126/1248429. PMID: 24675955. Campbell, F. A., Pungello, E. P., Burchinal, M., Kainz, K., Pan, Y., Wasik, B. H., Sparling, J. & Ramey, C. T. (2012). Adult outcomes as a function of an early childhood educational program: an Abecedarian Project follow-up. *Developmental Psychology, 48*, 1033. Campbell, F. A., Wasik, B. H., Pungello, E. P., Burchinal, M. R., Kainz, K., Barbarin, O., ... & Ramey, C. T. (2008). Young adult outcomes from the Abecedarian and CARE early childhood educational interventions. *Early Childhood Research Quarterly, 23*, 452-466. Campbell, F. A., Ramey, C. T., Pungello, E. P., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science, 6*, 42-57. Campbell, F. A., Pungello, E. P., Miller-Johnson, S., Burchinal, M., & Ramey, C. T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood educational experiment. *Developmental Psychology, 37*, 231-242. Ramey, C. T., Campbell, F. A., Burchinal, M., Skinner, M. L., Gardner, D. M., & Ramey, S. L. (2000). Persistent effects of early intervention on high-risk children and their mothers. *Applied Developmental Science, 4*, 2-14. Campbell, F. A., & Ramey, C. T. (1995). Cognitive and school outcomes for high-risk African-American students at middle adolescence: Positive effects of early intervention. *American Educational Research Journal, 32*, 743-772. Campbell, F. A. & Ramey, C. T. (1994). Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development, 65*, 684-698. Ramey, C. T. & Campbell, F. A. (1991). Poverty, early childhood education, and academic competence: The Abecedarian experiment. In A. Huston (Ed.), *Children reared in poverty* (190-221). New York: Cambridge University Press. Ramey, C. T., & Campbell, F. A. (1984). Preventive education for high-risk children: Cognitive consequences of the Carolina Abecedarian Project. *American Journal of Mental Deficiency, 88*, 515-523.
- The Perry Preschool Project focused on three- and four-year olds, employed one adult for every five or six children, and implemented home visits and monthly parent meetings. Researchers followed 123 children into their 40s and found that those who attended preschool had higher earnings, were more likely to have a job, had committed fewer crimes, and were more likely to have graduated from high school. Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). *Lifetime effects: The HighScope Perry Preschool study through age 40*. Ypsilanti, MI: HighScope Press.

4 A sample of varying evidence and perspectives:

- Research in support of preschool include a North Carolina study showing that children who attended preschool required special education services at a lower rate. Muschkin, C. G., Ladd, H. F., & Dodge, K. A. (2015). Impact of North Carolina's early childhood initiatives on special education placements in third grade. *Educational Evaluation and Policy Analysis, 37*, 478-500.

- A study of a Texas preschool program that was "not considered high-quality" according to the study authors found that preschool participants had increased math and reading scores in third grade and a reduced likelihood of retention or need for special education services; however, this study used pre-implementation cohorts as a comparison group, rather than random assignment. Andrews, R. J., Jargowsky, P., & Kuhne, K. (2012). The effects of Texas's targeted pre-kindergarten program on academic performance. (Working paper no. 84). CALDER. Retrieved from http://www.nber.org/papers/w18598.
- A much-publicized study out of Tennessee — and one of the few recent studies to use random assignment — found that while children who attended preschool outperformed their peers at the end of the preschool year, those children drew even with their peers by the end of kindergarten and fell behind their non-preschool-attending classmates by second grade. Lipsey, M. W., Farran, D. C., & Hofer, K. G., (2015). A Randomized Control Trial of the Effects of a Statewide Voluntary Prekindergarten Program on Children's Skills and Behaviors through Third Grade. Nashville, TN: Vanderbilt University, Peabody Research Institute. Retrieved from http://peabody.vanderbilt.edu/research/pri/VPKthrough3rd_final_withcover.pdf.
- Several earlier studies of preschool in Tennessee found that benefits faded after a few years but then reemerged in the form of higher rates of college attendance and degree completion. Dynarski, S., Hyman, J., & Schanzenbach, D. W. (2013). Experimental evidence on the effect of childhood investments on postsecondary attainment and degree completion. *Journal of Policy Analysis and Management, 32*, 692-717. Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W., & Yagan, D. (2010). *How does your kindergarten classroom affect your earnings? Evidence from Project STAR*. Cambridge, MA: National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w16381
- In a recent paper, preschool researcher Dale Farran argued that research still has not answered the questions about which skills and dispositions are most important to develop in young children and what instructional approaches will best develop them. Farran, D. C. (2015). *We need more evidence in order to create effective pre-K programs*. Washington, DC: Brookings Institute. Retrieved from http://www.brookings.edu/research/reports/2016/02/25-need-more-evidence-create-effective-prek-programs-farran.
- In April 2016, the Center for American Progress (CAP) and the American Enterprise Institute (AEI) published reports that drew divergent conclusions about the value of universal preschool. The CAP report, while acknowledging the problem of low-quality programs, primarily discusses the impact of effective programs that lead to long-term benefits and advocates for policymakers to expand access to such programs. The AEI report asserts that in the absence of clear evidence in support of preschool, policymakers should expand access to high-quality childcare and home-visiting programs, since evidence suggests these intensive program components may make the difference. Friedman-Krauss, A., Barnett, W. S., Nores, M. (2016). How Much Can High-Quality Universal Pre-K Reduce Achievement Gaps? Washington, DC: Center for American Progress. Retrieved from https://cdn.americanprogress.org/wp-content/uploads/2016/04/01115656/NIEER-AchievementGaps-report.pdf. Stevens, K. B., & English, E. (2016). Does Pre-K Work? The Research on Ten Early Childhood Programs — And What It Tells Us. Washington, DC: American Enterprise Institute. Retrieved from http://www.aei.org/wp-content/uploads/2016/04/Does-Pre-K-Work.pdf.

5 Head Start Act. Retrieved from http://eclkc.ohs.acf.hhs.gov/hslc/standards/law

6 As of 2014, 71 percent of Head Start teachers had a bachelor's degree or higher, 25 percent had an associate's degree, 3 percent had a CDA, and the remaining 1 percent had no related certification or degree. Head Start Act.

7 Barnett, W. S., Carolan, M. E., Squires, J. H., Clarke Brown, K., & Horowitz, M. (2015). *The state of preschool 2015: State preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research. Retrieved from http://nieer.org/sites/nieer/files/2015%20Yearbook.pdf.

8 Many preschool programs accept the Child Development Associate credential, or CDA. The CDA is widely available — over half a million people across the country possess this certification, although preschool is only one of the 4 focus areas of the CDA. To earn the certification, candidates must have a high school diploma and undergo 120 hours of

coursework and 480 hours of field experience. However, those seeking the credential can complete coursework at any of many training organizations and higher education institutions — and each institution determines which courses are eligible for the CDA, meaning that teachers with the CDA will have vastly different training backgrounds.

9 "Early Childhood" can be defined in many ways, including referring specifically to preschool, to birth through kindergarten, or preschool up to early elementary grades.

10 Information about Denver public schools comes from a personal phone call with Cheryl Caldwell, Director of Early Education for Denver Public Schools, on March 19, 2015. Information about Colorado's community-run schools comes from Colorado Office of Early Childhood Department of Human Services. (2010). *Early Childhood Teacher Chart*. Retrieved from http://www.coloradoofficeofearlychildhood.com/#!early-childhood-teacher/c1rqp. Information about Colorado's state-funded preschool programs comes from Barnett et al. (2015).

11 Information about San Francisco's preschools comes from a personal phone call with Ingrid Mezquita of Preschool for All on March 9, 2015.

12 Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook (2016-17 Edition). Preschool Teachers. Retrieved from http://www.bls.gov/ooh/education-training-and-library/preschool-teachers.htm. Whitebook, M., Phillips, D., & Howes, C. (2014). *Worthy work, STILL unlivable wages: The early childhood workforce 25 years after the National Child Care Staffing Study*. Berkeley, CA: Center for the Study of Child Care Employment, University of California, Berkeley. Retrieved from http://www.irle.berkeley.edu/cscce/wp-content/uploads/2014/11/ReportFINAL.pdf

13 The National Academies note that supporting early education professionals will require a great deal, including "making substantial improvements in working conditions, well-being, compensation, and perceived status or prestige" (page 12.2). Furthermore, "Society (the general public, policy makers, and even care and education professionals themselves) has tendedto perceive working with younger children as less demanding and prestigious work, a perception that runs counter to the science of child development and early learning presente" Page 9-3. Institute of Medicine and National Research Council. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation*. Washington, DC: The National Academies Press. Retrieved from http://www.nap.edu/catalog/19401/transforming-the-workforce-for-children-birth-through-age-8-a.

The Center for the Study of Child Care Employment adds, "teachers who work with children four years old or younger are typically not viewed by the public as part of our nation's teaching workforce, let alone as drivers of a better educational system. Most people imagine a teacher as someone who works in grades K-12; perhaps more importantly, much of the public is averse to the idea that pre-kindergarten teachers require levels of knowledge and skill as rigorous as those of their counterparts who teach older children" (page 3). Whitebook, M. (2014). *Building a skilled teacher workforce: Shared and divergent challenges in early care and education and in grades K-12*. Berkeley, CA: Center for the Study of Child Care Employment, University of California, Berkeley. Retrieved from http://www.irle.berkeley.edu/cscce/wp-content/uploads/2014/09/Building-a-Skilled-Teacher-Workforce_September-2014_9-25.pdf.

14 The most visible calls for preschool teachers to have at least bachelors' degrees come from the National Academies and NIEER. Institute of Medicine and National Research Council. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation*. Washington, DC: The National Academies Press. Retrieved from http://www.nap.edu/catalog/19401/transforming-the-workforce-for-children-birth-through-age-8-a. Barnett, W. S., Carolan, M. E., Squires, J. H., Clarke Brown, K., & Horowitz, M. (2015). *The state of preschool 2015: State preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research. Retrieved from http://nieer.org/sites/nieer/files/2015%20Yearbook.pdf. However, a 2007 review of seven studies of preschool found either no or contradictory relationships between teachers' level of education and their children's academic outcomes. Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., ... & Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*(2), 558-580.

15 In support of requiring at least a bachelor's degree, a 2004 report summarizing preschool research concluded that "the education levels of preschool teachers and specialized training in early childhood education predict teaching quality and children's learning and development" (Barnett, W.S. (2003). Better teachers, better preschools: Student achievement linked to teacher qualifications. *Preschool Policy Matters, 2*, 1-12).

In contrast, a 2007 review of seven preschool studies found contradictory relationships between teachers' level of education and child outcomes (Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., ... & Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*(2), 558-580). Two studies found evidence of higher classroom quality when teachers held higher degrees, one found evidence of lower classroom quality, and the remaining studies found no association. Additionally, none of the seven studies found a relationship between teacher degree levels and children's receptive language skills; some studies found associations between teacher degree and children's reading or math skills, however.

A more recent study found only small and mixed results related to preschool teachers' degree level. Whether a teacher held a bachelor's degree had a small, positive relationship with child development of social competence, no relationship to children's language and academic skills, and a small, negative relationship with measures of classroom quality and instructional support (Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., ... & Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79*(3), 732-749).

The inconclusive findings is somewhat surprising, given that other research has found moderate differences in the instructional content of teacher preparation programs at different degree levels (Buettner, C. K., Hur, E. H., Jeon, L., & Andrews, D. W. (2016). What are we teaching the teachers? Child development curricula in U.S. higher education. *Child & Youth Care Forum, 45*(1), 155-175.; Maxwell, K. L., Lim, C-I., & Early, D. M. (2006). *Early childhood teacher preparation programs in the United States: National report*. Chapel Hill: University of North Carolina, FPG Child Development Institute. Retrieved from http://fpg.unc.edu/node/5247.; Bornfreund, L. A. (2011). *Getting in sync: Revamping licensing and preparation for teachers in pre-k, kindergarten, and the early grades*. Washington, DC: The New America Foundation. Retrieved from http://fcd-us.org/resources/getting-sync-revamping-preparation-teachers-pre-k-kindergarten-and-early-grades.; Whitebook, M., & Austin, L. J. E. (2015). *Early childhood higher education: Taking stock across the states*. Berkeley, CA: Center for the Study of Child Care Employment, Institute of Research on Labor and Employment, University of California. Retrieved from http://www.irle.berkeley.edu/cscce/wp-content/uploads/2015/11/Cross-state-Brief-Final.pdf).

The difference could reside in the amount of specialized training focused on preschool years. (For example, one study found that while degree level had no relationship with teachers' ability to foster children's language development, teachers' specialized training in early childhood education and child development had a strong relationship. (Honig, A. S., & Hirallal, A. (1998). Which counts more for excellence in childcare staff—years in service, education level or ECE coursework? *Early Child Development and Care, 145*(1), 31-46)). In this vein, a 2010 study argues that preschool teachers should be required to have both a bachelor's degree and specialized early childhood training, given that the combination of both factors is stronger than either requirement in isolation (Bueno, M., Darling-Hammond, L., & Gonzales, D. (2010). *A matter of degrees: Preparing teachers for the preschool classroom*. Washington, DC: Pre-K Now, Pew Center on the States. Retrieved from http://www.pewtrusts.org/~/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/pre-k_education/pkneducationreformseriesfinalpdf.pdf).

In the 2007 paper noted above, five studies addressed the question of specialization. When considering only teachers who had an early childhood or child development major, three of the five studies found no relationship between teachers' highest degree and child outcomes; one found a positive relationship between degree and classroom quality, and the fifth did not have statistically significant findings (Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., ... & Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*(2), 558-580). Likewise, when considering only

teachers who earned a bachelor's degree, there was no relationship between teacher majors and child outcomes.

The study concludes, "Using seven recent, major studies of classroom-based educational programs for 4-year-olds, these analyses, taken together, do not provide convincing evidence of an association between teachers' education or major and either classroom quality or children's academic gains" (Early et al. (2007)).

16 Most previous research examined coursework related to emergent literacy but differed in their findings. Most positively, a survey of preparation programs in New Jersey, Indiana, and California found that roughly 98 percent of associate's programs, 96 percent of bachelor's programs, and 87 percent of master's programs required coursework on the topic (calculated based on data from Whitebook, M., & Austin, L. J. E. (2015). *Early childhood higher education: Taking stock across the states*. Berkeley, CA: Center for the Study of Child Care Employment, Institute of Research on Labor and Employment, University of California. Retrieved from http://www.irle.berkeley.edu/cscce/wp-content/uploads/2015/11/Cross-state-Brief-Final.pdf). A second national survey of over 1,100 institutions found that 77 percent of bachelor's programs devoted an entire course or more to emergent literacy, but did not verify whether the courses are targeted toward teaching preschool children (Maxwell, K. L., Lim, C-I., & Early, D. M. (2006). *Early childhood teacher preparation programs in the United States: National report*. Chapel Hill: University of North Carolina, FPG Child Development Institute. Retrieved from http://fpg.unc.edu/node/5247). A third report that analyzed programs in six states found a "lack of focused attention on recent research in emergent literacy." Furthermore, the study determined that many required courses focused on elementary rather than preschool-age children and in some cases addressed topics spanning preschool through high school (Bornfreund, L. A. (2011). *Getting in sync: Revamping licensing and preparation for teachers in pre-k, kindergarten, and the early grades*. Washington, DC: The New America Foundation. Retrieved from http://fcd-us.org/resources/getting-sync-revamping-preparation-teachers-pre-k-kindergarten-and-early-grades). Finally, a survey-based study of 175 programs concluded that prep programs tend to devote more than an entire course on "academic instruction and curricula," as defined according to National Association for the Education of Young Children (NAEYC) standards, but did not offer any specific insight into how well programs address literacy or any other specific discipline within this broader standard (Buettner, C. K., Hur, E. H., Jeon, L., & Andrews, D. W. (2016). What are we teaching the teachers? Child development curricula in U.S. higher education. *Child & Youth Care Forum, 45*(1), 155-175).

These studies suggest that preparation programs devote substantially less time to key topics other than emergent literacy, including emergent math and child development. In one, faculty rated early mathematics as least important among the teaching domains (Whitebook and Austin (2015)); another revealed that only 59 percent of bachelor's programs required an entire course on numeracy and math for young children (Maxwell et al. (2006)). Although educators and policymakers frequently cite social and emotional development as a primary benefit of preschool enrollment, only about half of programs prepare prospective preschool teachers in this area (Maxwell et al. (2006); Buettner et al. (2016)). These studies did not report findings on coursework in developing children's language skills.

Each study that disaggregated findings by program level reported differences, especially between associate's and bachelor's degree programs (not all included master's degrees). At the associate's level, programs focused more on "practices," like program and classroom management (Maxwell et al. (2006); Buettner et al. (2016)), and employed more faculty members with experience working in early childhood settings (Bornfreund (2011)). In contrast, bachelor's degree programs tended to require more coursework on "knowledge," such as early literacy and assessment (Maxwell et al. (2006); Buettner et al. (2016)). Finally, although research did not indicate whether field experiences consistently occurred in an early childhood setting, most associate's and bachelor's degree programs required a practicum, while bachelor's programs were more likely to require a full-fledged student teaching experience (Whitebook and Austin, (2015)).

A few caveats: three of the four studies above rely on surveys, which are hampered by issues of selection bias. Furthermore, these studies lack a mechanism to verify that survey respondents report data accurately or have a shared understanding of various terms (e.g., "using developmentally appropriate teaching practices"). Finally, these surveys do not examine specific aspects of course content and fieldwork expectations.

17 Hart, B., & Risley, T. R. (2003). The early catastrophe. *American Educator, 27*(4), 6-9.

18 Farkas and Beron (2004) found that across the span of 36 months to 13 years of age, white students had significantly higher oral vocabulary scores than African American students. Farkas, G., & Beron, K. (2004). The detailed age trajectory of oral vocabulary knowledge: Differences by class and race. *Social Science Research, 33*(3), 464-497. A research synthesis prepared by the National Early Literacy Panel discusses a modest correlation that grows stronger when "oral language" is defined as more complex than vocabulary size. However, some researchers argue that this study understates the importance of oral language. Neuman, S.B. (2010). Sparks fade, knowledge stays: The national early literacy panel's report lacks staying power. *American Educator, 34*(3), 14-17. Dickinson, D. K., Golinkoff, R. M., & Hirsh-Pasek, K. (2010). Speaking out for language: Why language is central to reading development. *Educational Researcher, 39*(4), 305-310. Dickinson, D., Golinkoff, R., Hirsh-Pasek, K., Neuman, S., & Burchinal, P. (2009). The language of emergent literacy: A response to the National Institute for Literacy report on early literacy. Retrieved from http://nieer.org/pdf/CommentaryOnNELPreport.pdf.

19 With regard to young children, "oral language" is a broad term that encompasses many specific skills. For instance:

- The IES defines oral language as "children's understanding and use of language to communicate ideas." Diamond et al. (2013).
- Piasta et al. (2012) place oral language *development* in two categories: "communication facilitation" (providing children with opportunities to speak and engage in turn-taking conversations) and "language-developing" (increasing the complexity of children's language through techniques such as recasting). Piasta, S. B., Justice, L. M., Cabell, S. Q., Wiggins, A. K., Turnbull, K. P., & Curenton, S. M. (2012). Impact of professional development on preschool teachers' conversational responsivity and children's linguistic productivity and complexity. *Early Childhood Research Quarterly, 27*(3), 387-400.
- Coll (2005) defines the components of oral language as "various skill sets including vocabulary (receptive and expressive), syntactic and semantic knowledge, and narrative discourse processes (memory, comprehension, and storytelling)."

To develop children's skills, teachers should engage children in frequent conversations with multiple back-and-forth exchanges. They should verbally describe their actions and the actions of the children in their class. Teachers should ask questions that inspire children to provide longer and more detailed responses (Diamond et al. (2013)). Teachers need to discuss the meaning of words during read-alouds and help children organize these words conceptually (Diamond et al. (2013); Beck, I. L., & McKeown, M. G. (2007). Increasing young low-income children's oral vocabulary repertoires through rich and focused instruction. *The Elementary School Journal, 107*(3), 251-271; Institute of Medicine & National Research Council. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation*. Washington, DC: The National Academies Press; M. Adams, personal communication, January 2016). They should encourage conversation, extend talk (e.g., by asking for more information), use relatively sophisticated vocabulary, and correct children when their speech is inaccurate (Dickinson, D. K., & Porche, M. V. (2011). Relation between language experiences in preschool classrooms and children's kindergarten and fourth-grade language and reading abilities. *Child Development, 82*(3), 870-88).

20 Diamond et al. (2013).

21 For example:

- One rigorous study found that when teachers underwent intensive professional development on a range of practices including language enrichment and scaffolding language, use of book readings to enhance language skills, and several other techniques directly related to language, their students showed gains in language comprehension and vocabulary. Landry, S. H., Swank, P. R., Smith, K. E., Assel, M. A., & Gunnewig, S. B. (2006). Enhancing early literacy skills for preschool children bringing a professional development model to scale. *Journal of Learning Disabilities, 39*(4), 306-324.
- Gerde et al. (2009) found that teachers with more extensive training/educational background in early childhood were

more likely to employ instructional approaches that lead to vocabulary gains. Gerde, H. K., & Powell, D. R. (2009). Teacher education, book-reading practice, and children's language growth across one year of Head Start. *Early Education and Development, 20*(2), 211-237.

- Another study found that teachers rarely used conversational responsivity and language developing strategies, although teachers' use of the former — and their students' language ability — improved when they trained in these areas. Piasta, S. B., Justice, L. M., Cabell, S. Q., Wiggins, A. K., Turnbull, K. P., & Curenton, S. M. (2012). Impact of professional development on preschool teachers' conversational responsivity and children's linguistic productivity and complexity. *Early Childhood Research Quarterly, 27*(3), 387-400.
- Neuman and Wright (2010) found that current preschool teachers showed no improvement after taking professional development coursework in early language and literacy development; however, they showed sustained improvement in teaching practices when completing this coursework in conjunction with weekly on-site coaching. Neuman S. B., & Wright, T. S. (2010). Promoting language and literacy development for early childhood educators: A mixed-methods study of coursework and coaching. *The Elementary School Journal, 111*(1), 63-86.

22 U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2012). *Early childhood education interventions for children with disabilities intervention report: Phonological awareness training*. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/intervention_reports/wwc_pat_060512.pdf.

23 Diamond et al. (2013). An additional study defines print knowledge as "young children's emerging knowledge of the specific forms and functions of written language. This includes understanding letters, rules governing print organization (e.g., left-to-right directionality of print in English orthography), and concept of word (i.e., words as being meaningful, discrete units that map to spoken words)." Piasta, S. B., Justice, L. M., McGinty, A. S., & Kaderavek, J. N. (2012). Increasing young children's contact with print during shared reading: Longitudinal effects on literacy achievement. *Child Development, 83*(3), 810-820.

24 Landry et al. (2006). Note that these studies focus specifically on children with learning disabilities. U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2012). *Early childhood education interventions for children with disabilities intervention report: Phonological awareness training*. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/intervention_reports/wwc_pat_060512.pdf.

25 Diamond et al. (2013).

26 Diamond et al. (2013).

27 Diamond et al. (2013); Piasta et al. (2012).

28 Watts et al. (2014) found that math achievement and gains between preschool and first grade were highly predictive of math achievement up to age 15, although the strength of the relationship faded over time. Watts, T. W., Duncan, G. J., Siegler, R. S., & Davis-Kean, P. E. (2014). What's past is prologue: Relations between early mathematics knowledge and high school achievement. *Educational Researcher, 43*(7), 352-360.

29 Diamond et al. (2013); Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., ... & Japel, C. (2007). School readiness and later achievement. *Developmental Psychology, 43*(6), 1428-1446. Other research found that children's math ability in preschool predicted their math ability at age 15, even after controlling for early reading ability and family characteristics. Watts et al. (2014).

30 Diamond et al. (2013).

31 Frye, D., Baroody, A. J., Burchinal, M., Carver, S. M., Jordan, N. C., & McDowell, J. (2013). *Teaching math to young children: A practice guide* (NCEE 2014-4005). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from https://ies.ed.gov/ncee/wwc/pdf/practice_guides/early_math_pg_111313.pdf.

32 Frye et al. (2013).

33 As summarized in Diamond et al. (2013), Gilliam and Golan (2006) report that preschool children are suspended at a higher rate than either elementary or secondary students. Gilliam, W. S., & Golan, S. (2006). Preschool and child care expulsion and suspension: Rates and predictors in one state. *Infants & Young Children, 19*(3), 228-245. Denton, Germino-Hausken, and West (2000) report ECLS-K data that 10 percent of children enter kindergarten exhibiting persistent behavior problems. Denton, K., Germino-Hausken, E., & West, J. (2000). *America's Kindergartners* (NCES 2000-707). Washington, DC: National Center for Education Statistics, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubs2000/2000070.pdf. Kupersmidt, Bryant, and Willoughby (2000) report that 10-23 percent of children in Head Start exhibit such problems. Kupersmidt, J.B., Bryant, D., & Willoughby, M.T. (2000). Prevalence of aggressive behaviors among preschoolers in Head Start and community child care programs. *Behavioral Disorders, 26*(26), 46-52.

34 Diamond et al. (2013). Epstein, M., Atkins, M., Cullinan, D., Kutash, K., and Weaver, R. (2008). *Reducing behavior problems in the elementary school classroom: A practice guide* (NCEE 2008-012). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/practice_guides/behavior_pg_092308.pdf. National Association for the Education of Young Children. (2010). 2010 NAEYC standards for initial & advanced early childhood professional preparation programs. Retrieved from http://www.naeyc.org/files/ecada/file/2010%20NAEYC%20Initial%20&%20Advanced%20Standards.pdf.

35 Training teachers to establish clear rules and routines, reward positive behavior, and redirect negative behavior may lead to improvements in children's self-regulation as well as gains in vocabulary, letter-naming, and math skills. (Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Bub, K., & Pressler, E. (2011). CSRP's impact on low-income preschoolers' preacademic skills: self-regulation as a mediating mechanism. *Child Development, 82*(1), 362-378). Training kindergarten teachers in the *Tools of the Mind* curriculum, which emphasizes executive functioning and the role of play in learning, helped improve children's reasoning and control of attention, as well as reading, vocabulary, and math skills (Blair, C., & Raver, C. C. (2014). Closing the achievement gap through modification of neurocognitive and neuroendocrine function: Results from a cluster randomized controlled trial of an innovative approach to the education of children in kindergarten. *PloS One, 9*(11), e112393)).

36 Mashburn et al. (2008).

37 Levine, A. (2006). *Educating school teachers*. Washington, DC: The Education Schools Project. Committee on the Study of Teacher Preparation Programs in the United States, & National Research Council. (2010). *Preparing teachers: Building evidence for sound policy*. National Academies Press.

38 Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis, 31*(4), 416-440; Rose, D. J., & Church, J. R. (1998). Learning to teach: The acquisition and maintenance of teaching skills. *Journal of Behavioral Education, 8*(1), 5-35.

39 The State Teacher Policy Yearbook recommends that student teaching last at least 10 weeks. Several weeks should be spent fulfilling full-time teaching responsibilities. Jacobs, S., Doherty, K., Joseph, N., Lakis, K., Staresina, S., & Wasbotten, C. (2015). *2015 State teacher policy yearbook: National summary*. Washington, DC: National Council on Teacher Quality. Retrieved from http://www.nctq.org/dmsView/2015_State_Teacher_Policy_Yearbook_National_Summary_NCTQ_Report/

40 Diamond et al. (2013).

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