NEPC Review: The Drawbacks of Universal Pre-K: A Review of the Evidence (Manhattan institute, February 2021)

Reviewed by:

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April 2021

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Executive Summary

With universal pre-K and child care back on the national political agenda, increased scrutiny of these proposals is expected and welcome. A Manhattan Institute policy brief reviews evidence relating to both means-tested and universal early childhood care and education programs. It concludes that both means-tested and universal programs may harm long-term child development, especially, but not only, for more advantaged children. The brief recommends rolling back the coverage of existing preschool education programs, increasing the intensity of services provided to the most deeply disadvantaged, and expanding child tax credits. The brief raises warnings about potential unintended negative consequences that are warranted, but omissions of research and unjustified assumptions make it a misleading and inadequate policy guide. The complexity of early care and education does not lend itself to simple policy prescriptions. A more meticulous review of the literature relying on fewer preconceptions might have led to more nuanced conclusions.

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I. Introduction

Research suggests that public investments in early care and education (ECE) can produce two broad benefits: increased maternal employment and earnings; and improved child well-being, school readiness, and a host of later educational, social and economic outcomes.[1] From an economic perspective, public expenditure on ECE is a joint product that offers immediate and future benefits for both children and parents, whose well-being and development are interdependent. ECE includes a broad mix of activities—formal and informal, parental and nonparental, home-based and classroom-based—that vary in the mix of benefits they intend to produce and in the age ranges and populations served.[2]

How public policy can best secure the potential benefits from ECE is a complex question that does not lend itself to simple policy prescriptions. Political debates, by contrast, do not thrive on complexity. Proponents have promised large benefits from public investments in ECE to the direct recipients and the broader society. Reality often has fallen far short, as Max Eden documents in a Manhattan Institute (MI) policy brief, *The drawbacks of universal pre-K: A review of the evidence*.[3] Despite the title's focus on universal pre-K, the brief reviews evidence on the effects of means-tested programs as well as universal programs, and child care supports for children under three as well as preschool education for three- and four-year-olds.

The evidence on effectiveness matters because substantial public investments have already been made in ECE and more have been proposed. If these can be improved, many children and families, including the most disadvantaged, will benefit. This NEPC review considers the evidence presented by the brief, the evidence it omits, and the extent to which the evidence warrants the brief's findings and conclusions.

II. Findings and Conclusions of the Report

The brief raises the specter that ECE policies will permanently harm children. It finds "more cause for alarm than optimism" and warns that universal programs can produce "lasting physical damage to their brain architecture."[4] The brief also concludes that neither proposed nor existing programs resemble those that produced long-term effects for children, while accepting claims that ECE programs increase women's labor force participation and that direct payments to parents improve child development without reservations.[5] The brief recommends against universal ECE programs and to "scale down the number of students who are served by publicly subsidized early education and focus intensively on the most disadvantaged children."[6] It calls for expansion of child tax credits and other direct subsidies to parents.[7]

III. The Report's Rationale for Its Findings and Conclusions

The brief's narrative literature review finds that ECE programs supported by public policy generally produce little or no benefits to children and often produce harm.[8] The brief claims that public ECE programs should reduce enrollments to deliver more intensive and effective services for the most severely disadvantaged in order to increase benefits and reduce harm. Given the demand for increased public investments in ECE, the brief views this proposal for cutbacks to be a "nonstarter" on its own, and therefore also recommends increasing direct payments to parents.[9] According to the brief, parents could allocate these funds to purchase ECE or invest in parenting and the home learning environment, removing a political "thumb on the scale" favoring women's workforce participation over child development.[10]

IV. The Report's Use of Research Literature

The brief reviews selected influential studies of seminal early intervention programs, center-based child care, public programs abroad, child subsidies in the United States, Head Start, and state-funded pre-K programs. Although the scope of the review is broad, it is insufficiently deep, and the brief's findings and conclusions are shaped by omissions that alter the overall picture and interpretation of the studies included.

The brief leans heavily on three studies of seminal early interventions that found substantial persistent effects on learning and development that increased later social and economic success: the Perry Preschool Project, the Abecedarian Project, and the Chicago Child Parent Centers (CPC) study.[11] It contrasts the findings from these studies with the lack of similar long-term outcomes for child care and large-scale public programs. A two-fold explanation is offered: Long-term outcomes may be largely due to effects on character and behavior rather than on academics; and, current and future ECE differ too much from the seminal interventions in design and population served to yield similar outcomes.[12]

The case for character and social behavior as the principal pathway to long-term outcomes

is built entirely on one interpretation of the seminal Perry Preschool study, but this case is contradicted by other Perry Preschool analyses not cited in the brief and by the other two seminal studies. The Perry Preschool study achievement effects are evident from kindergarten entry through adolescence.[13] Moreover, studies on the Perry Preschool omitted from the brief find cognitive pathways with interrelationships over time among cognition, motivation, and behavior.[14] The Abecedarian study found cognitive advantage to be the sole mediator of long-term outcomes,[15] and the Chicago CPC study identified multiple pathways including achievement.[16] Other omitted seminal studies find a strong cognitive/academic pathway to long-term benefits.[17] Finally, a small-scale randomized trial of a model pre-K program found some positive persistent effects on achievement for advantaged children.[18]

The brief's claim that ECE today differs from the seminal interventions in ways that invalidate simple extrapolations is on stronger ground. Child care and public preschool programs have weaker (and cheaper) designs and serve less disadvantaged populations, especially compared to the Perry and Abecedarian programs.[19] Some public preschool programs today closely resemble the CPCs', which were less intensive and expensive than the Perry and Abecedarian programs. However, many public programs lack the CPCs' adequately paid and well-qualified teachers, small classes, parent engagement, referrals to social and health services, and two years of services.[20]

The extent to which population changes may have altered program effectiveness from the time of the model programs remains unclear. Parent education levels have increased. Home learning environments have improved at all family income levels, and they have improved most for the lowest income families. However, more young children are from socially disadvantaged ethnic minority and from non-English home language backgrounds that may benefit more from high quality ECE.[21] The alternative ECE arrangements of children in lieu of public programs also may have changed in ways that could reduce the benefits of public programs.[22]

Studies of the effects of typical child care and subsidies find small lasting positive effects on cognition and negative effects on social behaviors.[23] The brief emphasizes weak associations of ECE quality with cognitive outcomes and negative impacts of centers on social behavior regardless of quality, highlighting long-term negative impacts on social behavior from public support for universal low-cost child care in Quebec. Yet, a more comprehensive review reveals more nuanced findings.[24] ECE policies negatively affect cognition and behavior for those induced to shift into lower quality care (typically more advantaged families) and positively affect those induced into higher quality.[25]

The brief relies on a highly selective narrative review of a small number of studies, omitting important studies and giving undue weight to specific interpretations of a few studies that skew its findings.

The brief provides cursory reviews of Head Start and public pre-K, and it omits Early Head Start (EHS) altogether. Its conclusions about Head Start derive from one randomized trial and to an even greater extent from one sibling comparison study, despite validity concerns with the sibling approach.[26] It also weights heavily a randomized trial of Tennessee's pre-K program that found positive effects on initial achievement that turned negative during the

elementary school years.

Notably, other studies given limited or no mention in the brief yield more nuanced findings. Head Start and public pre-K effects vary with family background, program characteristics, and context including subsequent experiences, and not all have null or negative long-term effects for today's children.[27]

V. Review of the Report's Methods

The brief relies on a highly selective narrative review of a small number of studies, omitting important studies[28] and giving undue weight to specific interpretations of a few studies that skew its findings. Its failure to cite meta-analyses (including some of universal programs) is especially noteworthy.[29] Meta-analysis permit systematic summaries across large numbers of studies that can more transparently identify patterns of similarity and differences in findings.

Although randomized trials deserve special attention because of their advantages for making causal inferences, they have their own vulnerabilities and disadvantages and do not necessarily yield more useful findings.[30] The Tennessee study, for example, is unusual in its finding that pre-K seems to have increased special education rates and in finding initially positive effects that turn negative. However, this difference from other state studies is not attributable to research design; this same pattern of effects on special education and on third grade achievement in Tennessee also were found by earlier nonexperimental studies.[31] The randomized trial gives additional credibility to these findings for Tennessee but does not make them more generalizable to other states. No other randomized trial of ECE, including the recent study of Boston's pre-K program, suggests negative long-term effects.[32]

The brief's strong reliance on a single sibling comparison study as evidence of negative Head Start effects is concerning. There is no suggestion of negative effects in either the Head Start randomized trial or in Head Start studies using other nonexperimental methods. Sibling comparison studies depend on untenable assumptions that unmeasured differences between siblings do not influence their ECE experiences and that parents do not compensate one sibling later for an early advantage given to another.

Finally, the omitted studies indicate that higher quality programs have larger, more enduring, and more broadly distributed effects than the brief acknowledges.[33]

VI. Review of the Validity of the Findings and Conclusions

Findings are, at best, partially supported by research. Some studies, indeed, find positive persistent impacts on children who are not economically disadvantaged.[34] ECE impacts on character and behavior matter, but cognitive and other pathways to long-term benefits also are important.[35] Far from suggesting that increased access to "high-quality" care harms

young children,[36] the negative effects of Quebec's universal child care subsidy policy can be explained as the result of a rapid expansion of child care that lowered quality (perhaps more in the short-run than the long-run) and led families to shift children into long hours of lower quality care.[37] Although most public programs in the United States may be too weak to produce substantive long-term average outcomes for today's children, some contemporary large-scale pre-K programs have produced long-term gains, on average or for subgroups.[38] Research not considered by the brief suggests that universal programs could produce larger net benefits even if disadvantaged children benefit disproportionately.[39]

In addition to the skewed findings, the brief's conclusions depend on several unwarranted assertions: Short-term benefits for children are ignorable, cognitive benefits are unimportant and not linked to long-term outcomes, and policies should not seek to influence women's employment. Yet, surely, child well-being and development before age five is not just valued for contributions to later well-being. Preventing hunger and maltreatment and providing rich experiences that bring children joy have intrinsic value. Cognitive impacts are important and interact with social-emotional benefits. Labor force participation and gender equity are valid concerns in ECE policymaking—all benefits and costs of ECE policy alternatives should be weighed together.[40] Significantly, the brief offers no evidence on the child development effects of direct payments to parents. Such payments can benefit children, but much depends on how the payments are designed and whether other policies support access to high-quality ECE.[41]

VII. Usefulness of the Report for Guidance of Policy and Practice

Policymakers should heed the brief's warning that some ECE policies are ineffective and even harmful for children. Also useful is the brief's assertion that highly disadvantaged children benefit most from high-quality ECE and that simply spending more public money to expand current ECE programs (without raising quality) will not support child development. If universal subsidies for cheap child care are substituted for investments in high-quality pre-K, the promised benefits will not materialize. The brief's other conclusions and policy prescriptions are poorly supported.[42]

More can be done to enroll highly disadvantaged children in high-quality programs than what is offered by the brief. Most three- and four-year-olds of parents with less than a high school education or family incomes below $20,000 per year do not attend any center-based ECE program.[43] Rather than curtailing programs that still enroll less than half of highly disadvantaged preschoolers, policymakers could simultaneously improve quality and coverage for those who will benefit most. Providing highly effective ECE at scale is neither simple nor easy, but it is possible.[44] The CPC and other effective models (e.g., New Jersey and North Carolina) should guide minimum standards for public pre-K programs.[45] Universal programs may be better at enrolling all highly disadvantaged children and produce larger gains while benefitting other children.[46] With respect to infants and toddler ECE, clearly quality

matters and can be improved.[47] Policymakers might design mutually supportive policies for direct payments to parents and public investments in ECE to support child development rather than viewing them as alternatives.[48]

Notes and References

1 Aos, S., Lieb, R., Mayfield, J., Miller, M., & Pennucci, A. (2004). *Benefits and costs of prevention and early intervention programs for youth*. Olympia, WA: Washington State Institute for Public Policy.

Currie, J. (2001). Early childhood education programs. *Journal of Economic Perspectives*, *15*(2), 213-238.

McCoy, D.C., Yoshikawa, H., Ziol-Guest, K.M., Duncan, G. J., Schindler, H.S., Magnuson, K., ... & Shonkoff, J.P. (2017). Impacts of early childhood education on medium-and long-term educational outcomes. *Educational Researcher*, *46*(8), 474-487.

Nores, M. & Barnett, W.S. (2010). Benefits of early childhood interventions across the world: (Under) Investing in the very young. *Economics of Education Review, 29*(2), 271-282.

Ramon, I., Chattopadhyay, S.K, Barnett, W.S., Hahn, R.A. & the Community Preventive Services Task Force (2018). Early childhood education to promote health equity: A Community Guide economic review. *Journal of Public Health Management & Practice, 24*(1), e8-e15.

Reynolds, A.J., Ou, S.R., Mondi, C.F., & Giovanelli, A. (2019). Reducing poverty and inequality through preschool-to-third-grade prevention services. *American Psychologist*, *74*(6), 653.

Ruhm, C., & Waldfogel, J. (2012). Long-term effects of early childhood care and education. *Nordic Economic Policy Review*, *1*(1), 23-51.

2 Nores, M. & Barnett, W.S. (2010). Benefits of early childhood interventions across the world: (Under) Investing in the very young. *Economics of Education Review, 29*(2), 271-282.

3 Eden, M. (2012, February). *The drawbacks of universal pre-K: a review of the evidence*. NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

4 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 4). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

5 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 4). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

6 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (pp. 4, 11-12). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

7 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (pp. 4, 12). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

8 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (pp. 6-10). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

9 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 12). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

10 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 12). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/

drawbacks-universal-pre-k-review-evidence-ME.pdf

11 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (pp. 5-6). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

12 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (pp. 6-10). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

13 Schweinhart, L.J., Barnes, H.V., & Weikart, D.P. (1993). *Significant benefits: The High/Scope Perry Preschool study through age 27*. Ypsilanti, MI: High/Scope.

Schweinhart, L.J. (2007, January). Outcomes of the High/Scope Perry Preschool Study and Michigan School Readiness Program. Ypsilanti, MI: High/Scope. Retrieved March 17, 2021, from https://www.researchgate.net/publication/254108264_Outcomes_of_the_HighScope_Perry_Preschool_Study_and_Michigan_School_Readiness_Program

14 Barnett, W.S., Young, J.W., & Schweinhart, L.J. (1998). How preschool education influences long-term cognitive development and school success: A causal model. In W.S. Barnett & S. Boocock (Eds.), *Early care and education for children in poverty: Promises, programs, and long-term results* (pp. 167-184). Albany: SUNY.

Xie, Y., Near, C., Xu, H., & Song, X. (2020). Heterogeneous treatment effects on Children's cognitive/non-cognitive skills: A reevaluation of an influential early childhood intervention. *Social Science Research*, *86*. Retrieved March 17, 2021, from https://doi.org/10.1016/j.ssresearch.2019.102389

15 Reynolds, A.J., Ou, S.R. (2016). Generative mechanisms in early childhood interventions: A confirmatory research framework for prevention. *Prev Sci* 17, 794–805. Retrieved April 6, 2021, from https://doi.org/10.1007/s11121-015-0611-6

16 Reynolds, A.J., Ou, S.R. (2016). Generative mechanisms in early childhood interventions: A confirmatory research framework for prevention. *Prev Sci* 17, 794–805. Retrieved April 6, 2021, from https://doi.org/10.1007/s11121-015-0611-6

17 Barnett, W.S. (2008). Preschool education and its lasting effects: Research and policy implications. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved March 17, 2021, from https://nepc.colorado.edu/sites/default/files/PB-Barnett-EARLY-ED_FINAL.pdf

Consortium for Longitudinal Studies (Eds.), (1983). *As the twig is bent...lasting effects of preschool programs*. Hillsdale, NJ: Erlbaum.

18 Larsen, J.M., & Robinson, C.C. (1989). Later effects of preschool on low-risk children. *Early Childhood Research Quarterly*, *4*, 133-144.

Larsen, J.M., Hite, S.J., & Hart, C.H. (1983). The effects of preschool on educationally advantaged children: First phases of a longitudinal study. *Intelligence*, *7*, 345-352.

19 Barnett, W.S., Friedman-Krauss, A.H., & Weiland, C. (2021). Scaling up effective preschool education: New directions for research. In S. Ryan, M.E. Graue, V. Gadsen & F. Levine (Eds.). *Advancing knowledge and building capacity for early childhood research* (pp.201-222). Washington DC: AERA.

Friedman-Krauss, A.H., Barnett, W.S., Garver, K.A., Hodges, K.S., Weisenfeld, G.G., & Gardiner, B.A. (2020). *The state of preschool 2019: State preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research. Retrieved March 17, 2021, from https://nieer.org/wp-content/uploads/2020/11/YB2019_Full_Report.pdf

20 Barnett, W.S. & Frede, E.C. (2017). Long-term effects of a system of high-quality universal preschool education in the United States. In H.-P. Blossfeld, N. Kulic, J. Skopek, & M. Triventi (Eds.), *Childcare, early education*

and social inequality: An international perspective (pp. 152-172). Cheltenham, UK: Edward Elgar Publishing.

Barnett, W.S., Votruba-Drzal, E., Dearing, E., & Carolan, M. (2017). Publicly-supported early care and education programs. In E. Votruba-Drzal & E. Dearing (Eds.), *Handbook of early childhood development programs, practices, and policies: Theoretically and empirically-supported strategies for promoting young children's growth in the United States* (pp. 161-186). NY: John Wiley & Sons.

Friedman-Krauss, A.H., Barnett, W.S., Garver, K.A., Hodges, K.S., Weisenfeld, G.G., & Gardiner, B.A. (2020). *The state of preschool 2019: State preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research. Retrieved March 17, 2021, from https://nieer.org/wp-content/uploads/2020/11/YB2019_Full_Report.pdf

Reynolds, A.J. (2019). The power of P-3 school reform. *Phi Delta Kappan*, *100*(6), 27-33.

21 Barnett, W.S., Friedman-Krauss, A.H., & Weiland, C. (2021). Scaling up effective preschool education: New directions for research. In S. Ryan, M.E. Graue, V. Gadsen & F. Levine (Eds.). *Advancing knowledge and building capacity for early childhood research* (pp.201-222). Washington DC: AERA.

Bartik, T.J., & Hershbein, B.J. (2018). *Pre-K in the public schools: Evidence from within US states*. Upjohn Institute Working Paper 18-285. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved March 20, 2021, from https://doi.org/10.17848/wp18-285

Bassok, D. (2010). Do Black and Hispanic children benefit more from preschool? Understanding differences in preschool effects across racial groups. *Child Development*, *81*(6), 1828-1845.

Bitler, M.P., Hoynes, H.W., & Domina, T. (2014). *Experimental evidence on distributional effects of Head Start* (No. w20434). National Bureau of Economic Research. Retrieved March 19, 2021, from https://www.nber.org/system/files/working_papers/w20434/w20434.pdf

De Haan, M., & Leuven, E. (2020). Head Start and the distribution of long-term education and labor market outcomes. *Journal of Labor Economics*, *38*(3), 727-765.

Kaiser, M., & Bauer, J.M. (2019). Preschool child care and child well-being in Germany: Does the migrant experience differ? *Social Indicators Research*, *144*(3), 1367-1390.

Phillips, D., Gormley, W., & Anderson, S. (2016). The effects of Tulsa's CAP Head Start program on middle-school academic outcomes and progress. *Developmental Psychology, 52*(8), 1247-1261. Retrieved March 22, 2021, from https://doi.org/10.1037/dev0000151

22 Barnett, W.S., Friedman-Krauss, A.H., & Weiland, C. (2021). Scaling up effective preschool education: New directions for research. In S. Ryan, M.E. Graue, V. Gadsen & F. Levine (Eds.). *Advancing knowledge and building capacity for early childhood research* (pp. 201-222). Washington DC: AERA.

23 Barnett, W.S. (2008). *Preschool education and its lasting effects: Research and policy implications*. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved March 17, 2021, from https://nepc.colorado.edu/sites/default/files/PB-Barnett-EARLY-ED_FINAL.pdf

24 Felfe, C., & Lalive, R. (2018). Does early child care affect children's development? *Journal of Public Economics*, *159*, 33-53. Retrieved March 17, 2021, from https://www.sciencedirect.com/science/article/pii/S0047272718300148

Hotz, V.J., & Wiswall, M. (2019). Child care and child care policy: existing policies, their effects, and reforms. *The ANNALS of the American Academy of Political and Social Science*, *686*(1), 310-338. Retrieved March 17, 2021, from https://journals.sagepub.com/doi/pdf/10.1177/0002716219884078?casa_token=T_FK-Dw7SDUYAAAAA:mBfAE82jRBnlJTzniEbf8Igb9X4mOo7liB2sVA_SYNlX347FkhVvQLfYQ-zaT4Y7RmR-cRYGx4xCnUQ

Vandell, D.L., Belsky, J., Burchinal, M., Steinberg, L., Vandergrift, N., & NICHD Early Child Care Research

Network. (2010). Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, *81*(3), 737-756. Retrieved March 17, 2021, from https://srcd.onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-8624.2010.01431.x?casa_token=6Th-KzTrlI6MAAAAA%3ADlOI3BvnxTJqc0G6v_fsu-Kytu_lD3pb08x1R26GLBhV2CDMFkuF-ttyb_X5pZhnF-4pLDh6-BXAhAoY

Vandell, D.L., Burchinal, M., & Pierce, K.M. (2016). Early child care and adolescent functioning at the end of high school: Results from the NICHD Study of Early Child Care and Youth Development. *Developmental Psychology*, *52*(10), 1634-1645. Retrieved March 17, 2021, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5115787/

25 Cornelissen, T., Dustmann, C., Raute, A., & Schönberg, U. (2018). Who benefits from universal child care? Estimating marginal returns to early child care attendance. *Journal of Political Economy*, *126*(6), 2356-2409. Retrieved March 17, 2021, from https://www.journals.uchicago.edu/doi/pdf/10.1086/699979?casa_token=EXWgLPDLKI0AAAAA:aZbMDGSO0a2OJ_c8YY_pgQq89Q7kVHXlDHSNiXse82PT03Ed_rhXswqLy-4Uvazc12kuaLNDgaAz3

Hotz, V.J., & Wiswall, M. (2019). Child care and child care policy: Existing policies, their effects, and reforms. *The ANNALS of the American Academy of Political and Social Science*, *686*(1), 310-338. Retrieved March 17, 2021, from https://journals.sagepub.com/doi/pdf/10.1177/0002716219884078?casa_token=T_FK-Dw7SDUYAAAAA:mBfAE82jRBnlJTzniEbf8Igb9X4mOo7liB2sVA_SYNlX347FkhVvQLfYQ-zaT4Y7RmR-cRYGx4xCnUQ

Vandell, D.L., Belsky, J., Burchinal, M., Steinberg, L., Vandergrift, N., & NICHD Early Child Care Research Network. (2010). Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, *81*(3), 737-756. Retrieved March 17, 2021, from https://srcd.onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-8624.2010.01431.x?casa_token=6Th-KzTrlI6MAAAAA%3ADlOI3BvnxTJqc0G6v_fsu-Kytu_lD3pb08x1R26GLBhV2CDMFkuF-ttyb_X5pZhnF-4pLDh6-BXAhAoY

Ding, W., Kottelenberg, M J., & Lehrer, S.F. (2020). *Anticipating the (un) expected: Evidence from introducing a universal childcare policy with a shortage of spaces*. Retrieved March 17, 2021, from http://econ.queensu.ca/faculty/lehrer/tripd.pdf

26 Barnett, W.S. & Camilli, G. (2002). Compensatory preschool education, cognitive development, and "race". In J. Fish (Ed.), *Race and intelligence: Separating science from myth* (pp. 368-406). Mahwah, NJ: Lawrence Erlbaum Associates.

Miller, D.L., Shenhav, N.A., & Grosz, M.Z. (2019). *Selection into identification in fixed effects models, with application to Head Start* (No. w26174). National Bureau of Economic Research. Retrieved March 20, 2021, from https://www.nber.org/system/files/working_papers/w26174/w26174.pdf

27 Akgündüz, Y.E., & Heijnen, S. (2018). Impact of funding targeted pre-school interventions on school readiness: Evidence from the Netherlands. *De Economist*, *166*(2), 155-178.

Barnett, W.S. (2008). *Preschool education and its lasting effects: Research and policy implications*. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved March 17, 2021, from https://nepc.colorado.edu/sites/default/files/PB-Barnett-EARLY-ED_FINAL.pdf

Barnett, W.S., & Frede, E.C. (2017). Long-term effects of a system of high-quality universal preschool education in the United States. In H.-P. Blossfeld, N. Kulic, J. Skopek, & M. Triventi (Eds.), *Childcare, early education and social inequality: An international perspective* (pp. 152–172). Cheltenham, UK: Edward Elgar.

Barnett, W.S., Votruba-Drzal, E., Dearing, E., & Carolan, M. (2017). Publicly-supported early care and education programs. In E. Votruba-Drzal & E. Dearing (Eds.), *Handbook of early childhood development programs, practices, and policies: Theoretically and empirically-supported strategies for promoting young*

children's growth in the United States (pp. 161-186). NY: John Wiley & Sons.

Bartik, T.J., & Hershbein, B.J. (2018). *Pre-K in the public schools: Evidence from within US states*. Upjohn Institute Working Paper 18-285. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved March 20, 2021, from https://doi.org/10.17848/wp18-285

Blanden, J., Del Bono, E., McNally, S., & Rabe, B. (2016). Universal pre□school education: The case of public funding with private provision. *The Economic Journal*, *126*(592), 682-723.

Brooks-Gunn, J., Gross, R.T., Kraemer, H.C., Spiker, D., & Shapiro, S. (1992). Enhancing the cognitive outcomes of low birth weight, premature infants: for whom is the intervention most effective? *Pediatrics*, *89*(6), 1209-1215.

Chaparro, J., Sojourner, A., & Wiswall, M.J. (2020). *Early childhood care and cognitive development* (No. w26813). National Bureau of Economic Research.

Dearing, E., & Zachrisson, H.D. (2017). Concern over internal, external, and incidence validity in studies of child-care quantity and externalizing behavior problems. *Child Development Perspectives*, *11*(2), 133-138.

Dodge, K.A., Bai, Y., Ladd, H.F., & Muschkin, C.G. (2017). Impact of North Carolina's early childhood programs and policies on educational outcomes in elementary school. *Child Development*, *88*(3), 996-1014.

Bailey, D.H., Duncan, G.J., Cunha, F., Foorman, B.R., & Yeager, D.S. (2020). Persistence and fade-out of educational-intervention effects: Mechanisms and potential solutions. *Psychological Science in the Public Interest*, *21*(2), 55-97.

Carta, F., & Rizzica, L. (2018). Early kindergarten, maternal labor supply and children's outcomes: Evidence from Italy. *Journal of Public Economics*, *158*, 79-102.

Early, D.M., Li, W., Maxwell, K.L., & Ponder, B.D. (2019). Participation in Georgia's Pre-K as a predictor of third-grade standardized test scores. *AERA Open*, *5*(2). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419848687

Gormley Jr, W.T., Phillips, D., & Anderson, S. (2018). The effects of Tulsa's pre□K program on middle school student performance. *Journal of Policy Analysis and Management*, *37*(1), 63-87.

Griffen, A.S. (2019). Evaluating the effects of childcare policies on children's cognitive development and maternal labor supply. *Journal of Human Resources*, *54*(3), 604-655.

Han, J., O'Connor, E.E., & McCormick, M.P. (2020). The role of elementary school and home quality in supporting sustained effects of pre-K. *Journal of Educational Psychology*, *112*(5), 956.

McCormick, M.C., Brooks-Gunn, J., Buka, S.L., Goldman, J., Yu, J., Salganik, M., ... & Casey, P.H. (2006). Early intervention in low birth weight premature infants: Results at 18 years of age for the Infant Health and Development Program. *Pediatrics*, *117*(3), 771-780.

Morris, P.A., Connors, M., Friedman-Krauss, A., McCoy, D.C., Weiland, C., Feller, A., ... & Yoshikawa, H. (2018). New findings on impact variation from the Head Start Impact Study: Informing the scale-up of early childhood programs. *AERA Open*, *4*(2), Retrieved April 6, 2021, from https://doi.org/10.1177/2332858418769287

Pages, R., Lukes, D.J., Bailey, D.H., & Duncan, G J. (2020). Elusive longer-run impacts of head start: Replications within and across cohorts. *Educational Evaluation and Policy Analysis*, *42*(4), 471-492.

Reynolds, A.J., Magnuson, K.A., & Ou, S. (2010). Preschool to third grade programs and practices: A review of research. *Children and Youth Services Review, 32*, 1121-1131.

Reynolds, A.J., & Temple, J.A. (Eds.). (2019). *Sustaining early childhood learning gains: Program, school, and family influences*. Cambridge University Press.

van Huizen, T., Dumhs, L., & Plantenga, J. (2019). The costs and benefits of investing in universal preschool: Evidence from a Spanish reform. *Child Development*, *90*(3), e386-e406.

Watts, T.W., Gandhi, J., Ibrahim, D.A., Masucci, M. D., & Raver, C.C. (2018). The Chicago School Readiness Project: Examining the long-term impacts of an early childhood intervention. *PloS one*, *13*(7). Retrieved April 6, 2021, from https://doi.org/10.1371/journal.pone.0200144

Welsh, J.A., Bierman, K.L., Nix, R.L., & Heinrichs, B.N. (2020). Sustained effects of a school readiness intervention: 5th grade outcomes of the Head Start REDI program. *Early Childhood Research Quarterly*, *53*, 151-160.

Zachrisson, H.D., & Dearing, E. (2015). Family income dynamics, early childhood education and care, and early child behavior problems in Norway. *Child Development*, *86*(2), 425-440.

Zachrisson, H.D., Dearing, E., Lekhal, R., Toppelberg, C.O. (2013). Little evidence that time in child care causes externalizing problems during early childhood in Norway. *Child Development, 84*(4), 1152-1170. Retrieved April 6, 2021, from https://doi.org/10.1111/cdev.12040

Zanoni, W., & Johnson, A.D. (2019). Child care subsidy use and children's outcomes in middle school. *AERA Open*, *5*(4). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419884540

28 For example:

Bartik, T.J., & Hershbein, B.J. (2018). *Pre-K in the public schools: Evidence from within US states*. Upjohn Institute Working Paper 18-285. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved March 20, 2021, from https://doi.org/10.17848/wp18-285

Dearing, E., & Zachrisson, H.D. (2017). Concern over internal, external, and incidence validity in studies of child-care quantity and externalizing behavior problems. *Child Development Perspectives*, *11*(2), 133-138.

Dodge, K.A., Bai, Y., Ladd, H.F., & Muschkin, C.G. (2017). Impact of North Carolina's early childhood programs and policies on educational outcomes in elementary school. *Child Development*, *88*(3), 996-1014.

Carta, F., & Rizzica, L. (2018). Early kindergarten, maternal labor supply and children's outcomes: Evidence from Italy. *Journal of Public Economics*, *158*, 79-102.

Early, D.M., Li, W., Maxwell, K.L., & Ponder, B.D. (2019). Participation in Georgia's Pre-K as a predictor of third-grade standardized test scores. *AERA Open*, *5*(2). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419848687

Fortin, P. (2018). Québec's childcare program at 20. *Inroads: The Canadian Journal of Opinion*, *42*, 52-64.

Larsen, J.M., & Robinson, C.C. (1989). Later effects of preschool on low-risk children. *Early Childhood Research Quarterly*, *4*, 133-144.

Laurin, J.C., Geoffroy, M.C., Boivin, M., Japel, C., Raynault, M.F., Tremblay, R.E., & Côté, S.M. (2015). Child care services, socioeconomic inequalities, and academic performance. *Pediatrics*, *136*(6), 1112-1124.

Larsen, J.M., Hite, S.J., & Hart, C. H. (1983). The effects of preschool on educationally advantaged children: First phases of a longitudinal study. *Intelligence*, *7*, 345-352.

van Huizen, T., Dumhs, L., & Plantenga, J. (2019). The costs and benefits of investing in universal preschool: Evidence from a Spanish reform. *Child Development*, *90*(3), e386-e406.

Watts, T.W., Gandhi, J., Ibrahim, D.A., Masucci, M. D., & Raver, C.C. (2018). The Chicago School Readiness Project: Examining the long-term impacts of an early childhood intervention. *PloS one*, *13*(7). Retrieved April 6, 2021, from https://doi.org/10.1371/journal.pone.0200144

Welsh, J.A., Bierman, K.L., Nix, R.L., & Heinrichs, B.N. (2020). Sustained effects of a school readiness inter-

vention: 5th grade outcomes of the Head Start REDI program. *Early Childhood Research Quarterly*, *53*, 151-160.

Zanoni, W., & Johnson, A.D. (2019). Child care subsidy use and children's outcomes in middle school. *AERA Open*, *5*(4). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419884540

29 Camilli, G., Vargas, S., Ryan, S., & Barnett, W.S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record, 112*(3), 579-620.

Hoagland, C., Fumia, D., & Reynolds, M. (2019). *Early childhood education for low-income students: A review of the evidence and benefit-cost analysis UPDATE* (Document Number 19- 12-2201). Olympia: Washington State Institute for Public Policy.

Li, W., Duncan, G.J., Magnuson, K., Schindler, H.S., Yoshikawa, H., & Leak, J. (2020). *Timing in early childhood education: How cognitive and achievement program impacts vary by starting age, program duration, and time since the end of the program*. EdWorkingPaper No. 20-201. Annenberg Institute for School Reform at Brown University.

Magnuson, K.A., Kelchen, R., Duncan, G.J., Schindler, H.S., Shager, H., & Yoshikawa, H. (2016). Do the effects of early childhood education programs differ by gender? A meta-analysis. *Early Childhood Research Quarterly*, *36*, 521-536.

Manning, M., Homel, R., & Smith, C. (2010). A meta-analysis of the effects of early developmental prevention programs in at-risk populations on non-health outcomes in adolescence. *Children and Youth Services Review*, *32*(4), 506-519.

Schindler, H.S., Kholoptseva, J., Oh, S.S., Yoshikawa, H., Duncan, G.J., Magnuson, K.A., & Shonkoff, J.P. (2015). Maximizing the potential of early childhood education to prevent externalizing behavior problems: A meta-analysis. *Journal of school psychology*, *53*(3), 243-263.

van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care? A meta-analysis of evidence from natural experiments. *Economics of Education Review*, *66*, 206-222.

30 Deaton, A., & Cartwright, N. (2018). Understanding and misunderstanding randomized controlled trials. *Social Science & Medicine*, *210*, 2-21.

Imbens, G.W. (2010). Better LATE than nothing: Some comments on Deaton (2009) and Heckman and Urzua (2009). *Journal of Economic literature*, *48*(2), 399-423.

Pritchett, L., & Sandefur, J. (2015). Learning from experiments when context matters. *American Economic Review*, *105*(5), 471-75.

31 Strategic Research Group. (2008). *Assessing the effectiveness of Tennessee's pre-kindergarten program: Annual report 2008–2009*. Columbus, OH: Strategic Research Group.

Strategic Research Group. (2010). *Assessing the effectiveness of Tennessee's pre-kindergarten program: Second annual report*. Columbus, OH: Strategic Research Group. Retrieved March 20, 2021, from https://comptroller.tn.gov/content/dam/cot/orea/advanced-search/orea-reports-2010/2010_OREA_SRGPreKSecondAnnualRptOct.pdf

Strategic Research Group. (2011). *Assessing the effectiveness of Tennessee's pre-kindergarten program: Final report*. Columbus, OH: Strategic Research Group. Retrieved March 20, 2021, from https://comptroller.tn.gov/content/dam/cot/orea/advanced-search/2011/2011_OREA_SRGPreKFinal.pdf

32 Barnett, W.S. (2008). *Preschool education and its lasting effects: Research and policy implications*. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved March 17, 2021, from https://nepc.colorado.edu/sites/default/files/PB-Barnett-EARLY-ED_FINAL.pdf

Meloy, B., Gardner, M., & Darling-Hammond, L. (2019). *Untangling the evidence on preschool effectiveness: Insights for policymakers*. Palo Alto, CA: Learning Policy Institute.

33 Bartik, T.J., & Hershbein, B.J. (2018). *Pre-K in the public schools: Evidence from within US states*. Upjohn Institute Working Paper 18-285. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved March 20, 2021, from https://doi.org/10.17848/wp18-285

Dearing, E., & Zachrisson, H. D. (2017). Concern over internal, external, and incidence validity in studies of child-care quantity and externalizing behavior problems. *Child Development Perspectives*, *11*(2), 133-138.

Dodge, K.A., Bai, Y., Ladd, H.F., & Muschkin, C.G. (2017). Impact of North Carolina's early childhood programs and policies on educational outcomes in elementary school. *Child Development*, *88*(3), 996-1014.

Carta, F., & Rizzica, L. (2018). Early kindergarten, maternal labor supply and children's outcomes: Evidence from Italy. *Journal of Public Economics*, *158*, 79-102.

Early, D.M., Li, W., Maxwell, K.L., & Ponder, B.D. (2019). Participation in Georgia's Pre-K as a predictor of third-grade standardized test scores. *AERA Open*, *5*(2). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419848687

Fortin, P. (2018). Québec's childcare program at 20. *Inroads: The Canadian Journal of Opinion*, *42*, 52-64.

Larsen, J.M., & Robinson, C.C. (1989). Later effects of preschool on low-risk children. *Early Childhood Research Quarterly*, *4*, 133-144.

Larsen, J.M., Hite, S.J., & Hart, C.H. (1983). The effects of preschool on educationally advantaged children: First phases of a longitudinal study. *Intelligence*, *7*, 345-352.

Laurin, J.C., Geoffroy, M. C., Boivin, M., Japel, C., Raynault, M.F., Tremblay, R.E., & Côté, S.M. (2015). Child care services, socioeconomic inequalities, and academic performance. *Pediatrics*, *136*(6), 1112-1124.

van Huizen, T., Dumhs, L., & Plantenga, J. (2019). The costs and benefits of investing in universal preschool: Evidence from a Spanish reform. *Child Development*, *90*(3), e386-e406.

Watts, T.W., Gandhi, J., Ibrahim, D.A., Masucci, M.D., & Raver, C.C. (2018). The Chicago School Readiness Project: Examining the long-term impacts of an early childhood intervention. *PloS one*, *13*(7). Retrieved April 6, 2021, from https://doi.org/10.1371/journal.pone.0200144

Welsh, J.A., Bierman, K.L., Nix, R.L., & Heinrichs, B.N. (2020). Sustained effects of a school readiness intervention: 5th grade outcomes of the Head Start REDI program. *Early Childhood Research Quarterly*, *53*, 151-160.

Zanoni, W., & Johnson, A.D. (2019). Child care subsidy use and children's outcomes in middle school. *AERA Open*, *5*(4). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419884540

34 Bai, Y., Ladd, H.F., Muschkin, C.G., & Dodge, K.A. (2020). Long-term effects of early childhood programs through eighth grade: Do the effects fade out or grow? *Children and Youth Services Review*, *112*, 104890.

Larsen, J.M., & Robinson, C.C. (1989). Later effects of preschool on low-risk children. *Early Childhood Research Quarterly*, *4*, 133-144.

van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care? A meta-analysis of evidence from natural experiments. *Economics of Education Review*, *66*, 206-222.

35 Barnett, W.S., Young, J.W., & Schweinhart, L.J. (1998). How preschool education influences long-term cognitive development and school success: A causal model. In W.S. Barnett & S. Boocock (Eds.), *Early care and education for children in poverty: Promises, programs, and long-term results* (pp. 167-184). Albany: SUNY.

Reynolds, A.J., Ou, S.R. (2016). Generative Mechanisms in early childhood interventions: A confirmatory re-

search framework for prevention. *Prev Sci* 17, 794-805. Retrieved April 6, 2021, from https://doi.org/10.1007/s11121-015-0611-6

Xie, Y., Near, C., Xu, H., & Song, X. (2020). Heterogeneous treatment effects on Children's cognitive/non-cognitive skills: A reevaluation of an influential early childhood intervention. *Social Science Research*, *86*, Retrieved March 17, 2021, from https://doi.org/10.1016/j.ssresearch.2019.102389

36 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 11). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

37 Fortin, P. (2017). *Twelve flawed statements of the Fraser Institute on Quebec's childcare program*. Montreal: University of Quebec. Retrieved March 23, 2021, from http://www.economistesquebecois.com/files/documents/2p/a7/pfortin-fraser-0417.pdf

Haeck, C., Lebihan, L., & Merrigan, P. (2018). Universal child care and long-term effects on child well-being: Evidence from Canada. *Journal of Human Capital*, *12*(1), 38-98.

Haeck, C., Lefebvre, P., & Merrigan, P. (2015). Canadian evidence on ten years of universal preschool policies: The good and the bad. *Labour Economics*, *36*, 137-157.

Laurin, J.C., Geoffroy, M.C., Boivin, M., Japel, C., Raynault, M.F., Tremblay, R.E., & Côté, S.M. (2015). Child care services, socioeconomic inequalities, and academic performance. *Pediatrics*, *136*(6), 1112-1124.

38 Barnett, W.S. (2008). *Preschool education and its lasting effects: Research and policy implications*. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved March 17, 2021, from https://nepc.colorado.edu/sites/default/files/PB-Barnett-EARLY-ED_FINAL.pdf

Barnett, W.S., & Frede, E.C. (2017). Long-term effects of a system of high-quality universal preschool education in the United States. In H.-P. Blossfeld, N. Kulic, J. Skopek, & M. Triventi (Eds.), *Childcare, early education and social inequality: An international perspective* (pp. 152-172). Cheltenham, UK: Edward Elgar.

Barnett, W.S., Votruba-Drzal, E., Dearing, E., & Carolan, M. (2017). Publicly-supported early care and education programs. In E. Votruba-Drzal & E. Dearing (Eds.), *Handbook of early childhood development programs, practices, and policies: Theoretically and empirically-supported strategies for promoting young children's growth in the United States* (pp. 161-186). NY: John Wiley & Sons.

Bartik, T.J., & Hershbein, B.J. (2018). *Pre-K in the public schools: Evidence from within US states*. Upjohn Institute Working Paper 18-285. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved March 20, 2021, from https://doi.org/10.17848/wp18-285

Dodge, K.A., Bai, Y., Ladd, H.F., & Muschkin, C.G. (2017). Impact of North Carolina's early childhood programs and policies on educational outcomes in elementary school. *Child Development*, *88*(3), 996-1014.

Early, D.M., Li, W., Maxwell, K.L., & Ponder, B.D. (2019). Participation in Georgia's Pre-K as a predictor of third-grade standardized test scores. *AERA Open*, *5*(2). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419848687

Gormley Jr, W.T., Phillips, D., & Anderson, S. (2018). The effects of Tulsa's pre□K program on middle school student performance. *Journal of Policy Analysis and Management*, *37*(1), 63-87.

39 Barnett, W. S. (2010). Universal and targeted approaches to preschool education in the United States. *International Journal of Child Care and Education Policy, 4*(1), 1-12.

Greenberg, M.T., & Abenavoli, R. (2017). Universal interventions: Fully exploring their impacts and potential to produce population-level impacts. *Journal of Research on Educational Effectiveness*, *10*(1), 40-67.

van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care?

A meta-analysis of evidence from natural experiments. *Economics of Education Review*, *66*, 206-222.

A recent evaluation of Georgia's pre-K program which is not means-tested found positive effects for children who qualified for free- or reduced-price lunch and negative effects for higher-income children. The study focuses on children who attended during the 2011-12 year which is notable for its unusually low spending per children, increased class size, and decreased school year (effectively a pay cut for teachers) as a result of the Great Recession's impacts on the state budget. Had higher quality been maintained, all of the children might have benefited. Early, D.M., Li, W., Maxwell, K.L., & Ponder, B.D. (2019). Participation in Georgia's Pre-K as a predictor of third-grade standardized test scores. *AERA Open*, *5*(2). Retrieved April 6, 2021, from https://doi.org/10.1177/2332858419848687

40 As an example see van Huizen, T., Dumhs, L., & Plantenga, J. (2019). The costs and benefits of investing in universal preschool: Evidence from a Spanish reform. *Child Development*, *90*(3), e386-e406.

41 Agostinelli, F., & Sorrenti, G. (2021). *Money vs. time: Family income, maternal labor supply, and child development*. University of Zurich, Department of Economics, Working Paper, (273, Revised version). Retrieved March 20, 2021, from https://ssrn.com/abstract=3102271

Bastian, J., & Lochner, L. (2020). *The EITC and maternal time use: More time working and less time with kids?* (No. w27717). National Bureau of Economic Research.

Berlinski, S., & Vera-Hernández, M. (2019). The economics of early interventions aimed at child development. *Oxford Research Encyclopedia of Economics and Finance*. Retrieved March 20, 2021, from https://doi.org/10.1093/acrefore/9780190625979.013.545

Hoynes, H., & Rothstein, J. (2019). Universal basic income in the United States and advanced countries. *Annual Review of Economics*, *11*, 929-958.

Michelmore, K., & Pilkauskas, N. (2020). Tots and teens: How does child's age influence maternal labor supply and child care response to the earned income tax credit? Retrieved March 20, 2021, from https://doi.org/10.1086/711383

Rostad, W.L., Klevens, J., Ports, K.A., & Ford, D.C. (2020). Impact of the United States federal child tax credit on childhood injuries and behavior problems. *Children and Youth Services Review*, *109*, 104718.

42 Eden, M. (2012, February). *The drawbacks of universal pre-K: A review of the evidence* (p. 12). NY: Manhattan Institute. Retrieved March 17, 2021, from https://media4.manhattan-institute.org/sites/default/files/drawbacks-universal-pre-k-review-evidence-ME.pdf

43 U.S. Department of Education (2019, December). Table 3. Nursery and primary school enrollment of people 3 to 6 years old, by control of school, attendance status, age, race, Hispanic origin, mother's labor force status and education, and family income: October 2018. *Current Population Survey October Supplement*. Retrieved March 21, 2021, from https://www.census.gov/data/tables/2018/demo/school-enrollment/2018-cps.html

44 Barnett, W.S., Friedman-Krauss, A.H., & Weiland, C. (2021). Scaling up effective preschool education: New directions for research. In S. Ryan, M.E. Graue, V. Gadsen & F. Levine (Eds.). *Advancing knowledge and building capacity for early childhood research* (pp. 201-222). Washington DC: AERA.

Barnett, W. S. & Frede, E.C. (2017). Long-term effects of a system of high-quality universal preschool education in the United States. In H.-P. Blossfeld, N. Kulic, J. Skopek, & M. Triventi (Eds.), *Childcare, early education and social inequality: An international perspective (pp. 152-172)*. Cheltenham, UK: Edward Elgar Publishing.

Weiland, C. (2018). Commentary: Pivoting to the "how": Moving preschool policy, practice, and research forward. *Early Childhood Research Quarterly*, *45*, 188-192.

45 Barnett, W.S. & Frede, E.C. (2017). Long-term effects of a system of high-quality universal preschool education

in the United States. In H.-P. Blossfeld, N. Kulic, J. Skopek, & M. Triventi (Eds.), *Childcare, early education and social inequality: An international perspective (pp. 152-172).* Cheltenham, UK: Edward Elgar Publishing.

Peisner-Feinberg, E., Zadrozny, S., Kuhn, L., & Van Manen, K. (2019). *Effects of the North Carolina pre-kindergarten program: Findings through pre-k of a small-scale RCT study*. Chapel Hill, NC: The University of North Carolina, FPG Child Development Institute. Retrieved April 5, 2021, from https://ncchildcare.ncdhhs.gov/Portals/0/documents/pdf/2/2017-18_NC_Pre-K_Eval_Report.pdf?ver=2019-04-23-115537-033

Reynolds, A.J., Ou, S.R., & Temple, J.A. (2018). A multicomponent, preschool to third grade preventive intervention and educational attainment at 35 years of age. *JAMA Pediatrics*, *172*(3), 247-256.

46 Bai, Y., Ladd, H.F., Muschkin, C.G., & Dodge, K.A. (2020). Long-term effects of early childhood programs through eighth grade: Do the effects fade out or grow? *Children and Youth Services Review*, *112*, 104890.

Barnett, W. S. (2010). Universal and targeted approaches to preschool education in the United States. *International Journal of Child Care and Education Policy, 4*(1), 1-12.

47 An example is provided by North Carolina's Smart Start program. Bai, Y., Ladd, H.F., Muschkin, C.G., & Dodge, K.A. (2020). Long-term effects of early childhood programs through eighth grade: Do the effects fade out or grow? *Children and Youth Services Review*, *112*, 104890.

48 Agostinelli, F., & Sorrenti, G. (2021). *Money vs. time: Family income, maternal labor supply, and child development*. University of Zurich, Department of Economics, Working Paper (273, Revised version). Retrieved March 20, 2021, from https://ssrn.com/abstract=3102271

Berlinski, S., & Vera-Hernández, M. (2019). The economics of early interventions aimed at child development. *Oxford Research Encyclopedia of Economics and Finance.* Retrieved March 20, 2021, from https://doi.org/10.1093/acrefore/9780190625979.013.545