Early Childhood Education and Care Services and Child Development: Economic Perspectives for Universal Approaches

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Abstract

This essay analyses universal early childhood education and care (ECEC) services from an economic perspective focusing on universal ECEC approaches. First, it examines the effectiveness of ECEC expansions, reviewing research using quasi-experimental approaches. It then discusses the possible mechanisms underlying the measured effects. These are related to both direct effects from ECEC services on children and indirect ones occurring via maternal employment and well-being. When ECEC-positive effects are detected, they mostly pertain to children from lower socioeconomic backgrounds. This raises the question as to whether this group of children is reached by universal ECEC services. The second part of the essay focuses on this issue, describing differences in ECEC attendance by socioeconomic background, distinguishing between different age groups and different aspects of ECEC attendance. The challenges for future research are summarized at the end.

INTRODUCTION

Early childhood education and care (ECEC) services are receiving ever greater attention. Increasingly, scholars of multiple disciplines acknowledge that the provision of good ECEC services is of major importance for child development. Education economists emphasize that investments in early life have particularly high returns, being much higher than investments at later ages. In particular, such considerations are linked to the work of the Nobel Prize winner James Heckman and his coauthors. Based on their skill formation model, they emphasize the complementarity of skills, predicting that higher levels of skills at an earlier stage beget further development of skills at a later stage (Cunha & Heckman, 2007; Cunha, Heckman, Lochner, & Masterov, 2006). Thus, investments in ECEC services might be efficient

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if they effectively increase children's skills at an early stage. For a long time, these effects were mainly analyzed by scholars from pedagogics and developmental psychology. Recently, however, the effects of ECEC attendance on child development are also studied by an increasing number of economists.

Overall, systematic economic research on the effects of ECEC on children has originated mainly in the American context. Economic research in this field began by evaluating the effectiveness and efficiency of particular high quality intervention programs targeting disadvantaged children. Prominent examples include the still ongoing evaluation of the Perry Preschool Program, one of the Abecedarian Programs, and the Chicago Child Parent Program (e.g., Barnett, 2011). While the first two examples are small-scale interventions, the last one involves more than 1000 children over several years. Other studies evaluated larger programs, such as Head Start (a federal program for low-income families). As most of this research is U.S.-related, it focuses on a publicly funded ECEC system that, until quite recently, was mainly designed to serve disadvantaged children. Thus, few studies examine the effects of universal ECEC provision that is prevalent in Europe. While the effects of the well-known high quality intervention studies show relatively large effects on child development, even in the long run, such as reductions in grade repetition, improved rates of high school completion, higher wages, and so on, the effects are much smaller once it comes to larger programs that offer ECEC at a much lower quality.

In contrast to the United States, most European countries, including Germany, have universal ECEC systems for children aged three or older, with generally no targeted programs. In principle, universal ECEC services seek to reach all children in a specific age group. For many years, there has been a dearth of research on the effectiveness of such universal programs.

Independent of a universal or target approach, ECEC services also have effects that relate to their care function, rather than their educational one. ECEC services allow parents, in particular mothers, to combine family responsibilities and formal employment. This care aspect may also affect child development, albeit indirectly. A larger family income may positively impact children's well-being by increasing material well-being or indirectly via improved parental well-being. Moreover, ECEC services, *per se*, can increase parental well-being, as they facilitate the combination of work and family life. Such changes in well-being might also affect child development. Yet, such effects may arise from some ECEC but not from others.

The focus of this essay is on universal ECEC systems, as they are typical of most European countries. Taking an economic perspective, this essay describes some of the recent research in this area and discusses caveats that might be addressed in future research. In the first part, I summarize

some recent evaluation studies on universal ECEC programs—focusing on specific examples. This is followed by a discussion of the mechanisms behind potential ECEC effects on child development. The second part describes the coverage of such programs—taking Germany as an example: Are there differences by socioeconomic status (SES) in the attendance of such programs? If so, what are the underlying reasons? I conclude by highlighting the challenges for future research.

EFFECTIVENESS OF UNIVERSAL PROGRAMS—SOME EXAMPLES

An increasing number of economic studies evaluate the effectiveness of universal programs on child development. One reason behind this trend is that more and better micro data are available to researchers. In particular, the increasing availability of longitudinal survey datasets including child development measures and of administrative datasets has allowed researchers to analyze mid- or long-term outcomes of children.

Moreover, while much of the previous research mainly estimates associations, substantial improvements have been made in the methods used to identify the causal effects of ECEC services on child development. Primarily using quasi-experimental approaches, recent studies claim to measure true ECEC effects by taking into account that many observable and, in particular, unobservable factors influence the association between ECEC programs and child development. These studies exploit ECEC policy changes to identify the effects of ECEC services on child development in the short, middle, and long runs. From an economic perspective, long-term effects are of particular interest. If ECEC programs affect educational attainment, employment, and health outcomes, as well as family formation processes, it is not only the individual child who benefits but also society and the economy as a whole. If ECEC programs, for example, reduce high school dropout rates, society benefits from reduced expenditures on remedial services and increased tax revenues generated by higher level of education and, in turn, of higher earnings.

A first example of such evaluation studies analyzes the long-term effects of the expansion, since 1975, of universal day care in Norway. Havnes and Mogstad (2011) use administrative micro data covering almost the entire Norwegian population to investigate this large-scale expansion of subsidized child care. Their results show that subsidized ECEC had strong positive effects on children's educational attainment also reducing children's later welfare dependency. Subsample analyses indicate that children of low educated mothers benefit the most from the increased availability of ECEC services. A more recent study of the same ECEC reform examines the longer term effect by looking, in particular, at the impact on the earnings of the

adults who, as children, were affected by the ECEC expansion. The analysis reveals that most of the gains in earnings accrued to children of low-income parents, whereas children from the upper part of the income distribution actually experienced a loss in earnings. In line with the differential effects by family income, they estimate that universal ECEC provision substantially increased intergenerational income mobility (Havnes & Mogstad, 2015).

A second example is the evaluation of a Danish ECEC expansion. Datta Gupta and Simonsen (2010) analyze short- and medium-run effects. They exploit variation across municipalities in guaranteed access to center-based ECEC and focus on noncognitive child outcomes. Their results can be approximately interpreted as the effects of attending ECEC programs 1 year earlier—thus the changes they analyze are not as significant as in the Norwegian case, which focuses on whether there is ECEC access at all. They find that, compared to home care, being enrolled in ECEC at age three does not lead to significant differences in child outcomes at age seven. The same approach is used for another study focusing on an entire birth cohorts of ethnic Danish children, enrolled in either center-based ECEC or family day care at age two. This study shows that center-based ECEC improves grades in Danish language in the final year of compulsory school (Datta Gupta & Simonsen, 2015).

The third example relates to research that exploits ECEC policy changes in Germany. One study uses, as a quasi-experiment, the 1996 introduction of the German entitlement to an ECEC place for children aged three or older. The estimates show a positive effect of earlier ECEC entry on children's social behavior (Schlotter, 2012). Another study exploits a more recent ECEC expansion aimed at children younger than three. Drawing on administrative data for one German state, this study shows that an early ECEC start was more beneficial for developing socio-emotional maturity for children of less educated mothers than for children of highly educated mothers (Felfe & Lalive, 2014). Other research by Müller, Spiess, and Wrohlich (2013) also finds effects on noncognitive skills, such as socio-emotional behavior and the locus of control.

However, there is some evidence from quasi-experimental approaches pointing to negative effects of policies related to universal ECEC—although these look at all children and not specific subgroups. Pertinent examples are studies that evaluate the introduction of subsidized, widely accessible ECEC in the Canadian province of Quebec over the 1997–2000 period. Baker, Gruber, and Milligan (2008, 2015) find no impact on children's cognitive skills but substantial negative effects on children's noncognitive development in the short run and even in the long run. Kottelenberg and Lehrer (2014), using the same quasi-experiment, explicitly focus on differences in the age children gained access to ECEC. Their estimates show that

children who gained earlier access experience significantly larger negative impacts on certain outcomes. However, their further subgroup analysis shows that access to ECEC services at 3 years of age may benefit the most disadvantaged.

These few examples are in line with other research in showing that, when they occur, ECEC's positive effects pertain to children from lower SES. Nevertheless, results differ by various aspects, and less is known about the potential mechanisms behind the effects. These potential mechanisms are the focus of the following considerations.

SEVERAL MECHANISMS

ECEC Quality

The majority of studies with a quasi-experimental design consider policy changes resulting in *quantitative* ECEC expansions. However, little is known about how these expansions in quantity affected ECEC quality. Yet, as we know from research mainly outside economics, ECEC quality matters for child development. Although some economic studies acknowledge the importance of quality and attempt to describe the changes in quality that accompanied the policy change considered, this does not allow separating pure quantity from pure quality effects. Such distinction is especially difficult to make given the available data. Most datasets used for the aforementioned quasi-experimental approaches do not contain any information on ECEC quality. Some more recent economic studies incorporate some information on ECEC quality, but the indicators used mainly relate to structural quality, such as staff–child ratios, group sizes, or staff training, which are very crude measures of ECEC quality from the perspective of other disciplines, such as educational research. Indeed, scholars of other disciplines would argue that measures of process or orientation quality are needed to explain ECEC quality effects on child development. Regardless, economic evidence on the effects of ECEC quality is scarce, with some of the negative ECEC expansion effects found possibly related to the fact that ECEC expansion in quantity was achieved at the expense of ECEC quality.

Alternative Care Modes

Another potential mechanism through which ECEC expansion may affect child development relates to the counterfactual mode of care. Do expansions of ECEC programs crowd out informal nonparental care provided by grandparents, friends, or neighbors? Or does it substitute for maternal care? More crucially for our question about mechanisms, does the expansion result in substituting for care of higher, lower, or similar quality? Although

some economic studies address this issue, methodological approaches and available data often do not allow identifying the quality of the alternative mode of care used. Thus, results indicating positive effects of ECEC for children of lower SES can often only be *interpreted*, rather than proven, as ECEC services may or may not be substituting for care of lesser quality.

While most studies mainly address direct effects of ECEC expansions on child development, indirect effects might also occur as a result of changes in parental, mainly maternal, outcomes. Two especially salient outcomes are maternal employment and maternal well-being.

Maternal Employment

There is a vast literature on the direct effects of ECEC expansion on maternal employment for various European countries. However, the results of these studies differ: While some find substantial effect of ECEC expansion on the labor force participation of mothers of particularly young children, others only find modest effects. Modest effects are usually found when mothers of older children and more recent cohorts are considered. This can be explained by the very high coverage rates of ECEC for children 3 years and older. As almost all children in this age group attend ECEC, a small expansion has only modest, if any, employment effects. Thus, it is more reasonable to expect a greater effect on maternal employment when ECEC for children younger than three is expanded. However, even in this case, it is not clear whether indirect positive effects of ECEC on child development arise from maternal employment.

On the one hand, maternal employment increases household income, all else equal. There is evidence from studies that an increase in household income, especially at the lower end of the income distribution, can be beneficial for child development. There are a number of economic studies showing that increases in households' *permanent* income can have particularly positive effects on child development. On the other hand, an increase in maternal employment might be related to a decrease in maternal time spent with children. Again, there are several economic studies addressing this issue. What they mainly show is that the quantity of time is not as relevant as the quality. Quality time is often measured by the activities mothers do with their children. Ideally, one would like to measure changes in maternal activities due to changes in maternal employment, which again are due to ECEC expansion. However, data allowing this type of measurement are very rare. Thus, it is also difficult to identify the underlying mechanisms.

Moreover, maternal employment changes might not be solely related to changes in the availability of ECEC, but also changes in its quality. This

might occur as mothers are concerned about ECEC quality as it affects their child's well-being. Thus, their employment decision might not only be related to ECEC access *per se*, but rather to accessing quality ECEC. Although research on this particular association is particularly scarce, existing studies suggest that such association might exist. For instance, Schober and Spiess (2015) show that structural quality indicators matter for the employment of mothers of children younger than three in East Germany: The higher the ECEC quality was, the higher was their employment probability. Thus, it could be that they delayed their labor market reentry due to insufficient ECEC quality. However, as it is already problematic to separate ECEC quality effects from ECEC quantity effects, the identification of this specific mechanism is even more difficult. Overall, it is clear that measuring the indirect effect of maternal employment on child development is extremely challenging. However, this does not imply that such effects do not exist, and any interpretation of "overall" ECEC effects should acknowledge this point.

Maternal Well-Being

Another indirect mechanism through which the expansion of ECEC may affect children relates to changes in maternal well-being. Very few studies systematically examine this issue and even fewer address the question of paternal well-being. However, if the expansion directly affects maternal well-being, this again might affect child development. There is evidence within economics (and other disciplines) that maternal life satisfaction has an effect on child development. Higher life satisfaction, for instance, is associated with more stable socio-emotional behavior of children (e.g., Berger & Spiess, 2011). In addition, there is some evidence that ECEC expansions affect maternal well-being. A new German study, for instance, shows that, in particular, the increase in full-time ECEC services for preschoolers improved maternal well-being (Schober & Stahl, 2016). More empirical evidence on this association is needed, but the underlying problem is, once again, a lack of suitable data that allows this type of ECEC evaluation. However, if different ECEC expansion mechanisms are considered, changes in maternal well-being should also be considered.

In sum, economic studies show that ECEC expansions, irrespective of the underlying mechanism, are mainly beneficial for children from low SES, if we can measure positive effects at all. This is true although we focus on universal approaches that, in principle, do not target specific groups. This raises the question as to whether the children who benefit most are covered by such programs.

DIFFERENCES BY SOCIOECONOMIC BACKGROUND

To answer this question, ECEC attendance for two groups of children is described: the group of children younger than three, and the group of children three and older but not yet in school. This distinction is necessary because in most European countries the ECEC systems are different for the two age groups.

Children Younger Than Three

In recent years, the attendance rates of children younger than three has increased in many European countries with universal ECEC services. In 2014, average attendance in some form of ECEC across EU countries was approximately 35% among children younger than three. However, there are differences across countries. The increases are particularly pronounced in Germany (18.7 percentage points from 2006 to 2014), but they have also been considerable in the same period at around 10 to 12 percentage points in other mid- or northern-European countries (OECD, 2017).

However, in most European countries, very young children are more likely to attend any form of ECEC if they come from relatively advantaged socioeconomic backgrounds. For example, in many European countries, attendance rates for children younger than three increase with household income. In France and Ireland, for example, attendance rates for children from low-income families are 19% and 11%, respectively, which are significantly lower than those of children from high-income families (81% and 55%). Similarly, in a number of European countries, children are also more likely to attend ECEC if their mother attained tertiary education. In Austria, for example, the attendance rate for children with a mother who attained tertiary education is 31%, 20 percentage points higher than the rate for children whose mother has not attained tertiary education (11%) (OECD, 2017).

In Germany, attendance rates also differ by income and education. However, detailed analysis shows that these associations are partly explained by maternal employment status. Until 2013, employed mothers, mothers in education, and single mothers were given priority in accessing highly rationed ECEC places for children younger than three. Thus, once the group of employed and nonemployed mothers is analyzed separately, the association with education disappears; while, at least for West Germany, the association with income remains, with the probability of attending any form of ECEC increasing with household income. Remarkable is the result that migrant children have a much lower probability of attending ECEC than other children, even after controlling for a number of socioeconomic factors. This result is especially strong if both parents have a migration background (e.g., Schober & Spiess, 2013).

One might expect that the expansion of ECEC services by making more places available would reduce differences in attendance rates by SES. Germany is a particularly interesting country to study this question. Since 2005, there has been significant growth in the public funding of ECEC services and a steep increase in availability. In addition, since 2013, all children 1 year or older are entitled to ECEC. Nevertheless, recent research shows that not all SES groups benefited from the German expansion in the same way. Differences in the attendance rates by SES even increased. Children without migration background, children from non-poor families, and those with higher educated parents had relatively higher increases in the attendance probability than other groups (Stahl & Schober, 2017). Thus, the groups that, in principle, would benefit the most are those with the lowest relative increase in attendance. Why might that be the case?

Reasons for Non-Attendance

Systematic in-depth research on the reasons for relatively lower attendance rates among children from lower socioeconomic background in universal ECEC systems, however, is scarce. Demand- and supply-side factors should be discussed. On the demand side, a number of factors could be at work. Different groups might have different preferences for ECEC services. For example, poor families may have educational and childcare preferences for their children that are different from those of better-off families. For cultural and other reasons, the same could be true for parents with a migration background. If preferences were the reason for not attending, an increase in the number of places available with no other change would not result in higher attendance rates. Further reasons might apply, including supply-side reasons. High costs for ECEC services could be one aspect, in particular for low-income households. This cannot be ruled out, *per se*, since economic studies show that the demand for ECEC depends on the "price" of these services. However, in some countries, such as Germany, income-dependent parents' fees are the norm in most regions. In cases of hardship, the fees are often waived or paid by other public agencies.

Another reason for non-attendance might be insufficient supply in a context of high parental demand; then parents are "rationed." This might be due to a general lack of slots, or it might be specific for particular groups that are not prioritized. Alternatively, specific aspects of a particular supply might not match the demands of parents, such as opening hours or commuting time to ECEC centers. Moreover, economic theory suggests that providers may engage in indirect or direct discrimination by prioritizing, for example, children from higher income families over other

groups. Such behavior would be economically rational, all else equal, if the funding of ECEC centers were strongly linked to parental income. But since many ECEC systems in continental Europe are highly subsidized, this kind of discrimination is unlikely to be the sole explanation. Overall, if supply-side reasons dominate, an expansion of ECEC services in general or for particular groups would increase the attendance rates of children whose parents actually demand ECEC services. However, there is little systematic empirical research on these different reasons and, thus, still much to learn.

Children from 3 Years to Compulsory School Age

Among older children, aged three and older, attendance rates do not differ by SES, as under a universal ECEC system the majority of children in this age group attend some form of ECEC. In the majority of European countries, over 85% of children aged three to five are enrolled in ECEC programs, although there is some variation across countries, with Belgium, Germany, and France having attendance rates around or above 98% (OECD, 2017). For this age group, other differences might apply. These are differences that often also apply to the younger age group and, thus, come on top to the described SES differences in attendance rates.

Other Differences by SES

Beside questions about attendance as a binary variable, the following other aspects of attendance might occur: Once children attend ECEC services, the questions of ECEC intensity (daily and weekly duration) and, more importantly, ECEC quality arise. Are there differences by SES with respect to the intensity and quality of care?

While there is substantial evidence that better ECEC quality is beneficial for child development, the evidence on the effects of intensity of care is not as clear. The "dose effects" depend on several factors, such as the age of the child, the quality of the alternative care mode, and the considered development measure. Effects differ if cognitive or noncognitive measures are analyzed. Nevertheless, there is empirical evidence that intensity differs by SES. In Germany, for instance, children of single parents, children with migration background, children with employed mothers, and those of higher income have a higher probability of attending ECEC full time than do other groups (Schober & Spiess, 2013). In particular, given the lack of clear evidence on the effects of full-time or half-time ECEC in a universal system, it is not possible to conclude how these differences translate into differences in child development.

There is further systematic research, at least on the descriptive level, about SES differences in the level of ECEC quality, although only a few systematic studies use representative data. This research shows that children with a migration background or those from households with lower income have a higher probability of being in ECEC of lower quality than their peers (Stahl, Schober, & Spiess, 2017). However, the observed differences in Germany and other countries with universal ECEC approaches are much smaller than in other countries, such as the United States with not such universal systems and a much higher variety in ECEC quality.

Less is known about the reasons underlying SES differences in ECEC quality. On one hand, parents might have different preferences for ECEC quality or parents might be differently informed about ECEC quality and its effects on child development. On the other hand, ECEC quality might depend on the context or the neighborhood of the ECEC setting. More systematic research on testing these different drivers is needed to further our understanding of SES differences in ECEC intensity and quality.

CONCLUSION

Although economists have studied ECEC services for many years mainly in a context of targeted systems, newer research examines the effects of universally provided ECEC services. Using quasi-experimental models, this research shows that ECEC expansion can have short-, mid- and long-term effects depending on the various factors of the expansion. However, the research on the mechanisms behind these effects is still small. Thus, it is a particular challenge for future research to learn more about these mechanisms. However, more suitable data are needed to accomplish this. In particular, data covering information on ECEC quality, the quality of alternative care modes, and parental well-being are needed. A better understanding of the mechanisms would also be helpful from a policy perspective, as this information is essential for designing policies that effectively and efficiently reach all children.

The available research shows that, if positive ECEC effects on child development are found, they mainly concern children from lower socioeconomic backgrounds. Thus, the question is whether this group of children attends ECEC. This is not the case for children younger than three—here differences in attendance by SES can be observed. Further evidence also suggests SES differences in the choices of ECEC quality. These patterns emerge for all age groups. If there is a systematic selection into ECEC of varying quality, this would be an indication of unequal educational opportunities in universal systems. Yet more systematic research is needed, in particular with respect to quality. Finally, it is important to learn more about the mechanisms why

the attendance rates of children from lower socioeconomic background are lower than of those of their more advantaged peers and in particular why we observe SES differences in ECEC quality. Such understanding would help to better design policies aimed at providing high quality ECEC to *all* children.

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