A SELECTIVE SURVEY OF THE LITERATURE ON EARLY CHILDHOOD DEVELOPMENT (ECD) AND THE BRAZILIAN EXPERIENCE [1]

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"Skill formation is a life cycle process.
It starts in the womb and goes on throughout life"
(Cunha, Heckman, Lochner and Masterov, 2005, *Abstract*)

1. INTRODUCTION

Research conducted in many countries (usually focusing those in the developed world) has shown that interventions that prevent deficits at an early — i.e., preschool — age are more effective than interventions aiming at promoting adequate learning at school level.[3] The importance of these interventions and of ECD in general has long been recognized in the literature[4] as a crucial process through which children can improve their present and future health conditions, ability to learn and perform better in adult life. ECD as a set of services is usually understood to include education and other, complementary interventions in health, nutrition and social assistance, targeted at the physical and intellectual growth of children in their early years. Thus, ECD services include activities as diverse as health and nutrition services, parental education, home visits by trained professionals, and daycare and preschool (both center-based and provided by informal institutions). These two last components are termed early child education (ECE), and a sizeable proportion of recent work on ECD is specifically focused on it. So is the present note.

The note will attempt to evaluate the extent to which ECD contributes to improve the internal efficiency of primary and secondary schools and create more equal educational opportunities between poor and rich children. It will focus on Brazilian policies and studies and on coverage of the educational services provided, but will provide evidence on programs and interventions elsewhere as well. Quality of service and efficiency of public spending at the daycare (0-3 years) and preschool (4-6 years) age levels, although difficult to gauge, also deserve attention. The note will also address: (a) the quality of ECD services (training of services providers, accreditation, appropriate materials, etc.); (b) issues associated with delivering and financing of ECD services (management issues, role of private versus public

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[1] Survey prepared for the World Bank (June 2006). The responsibility for the analysis and statements in the text is our own. It does not reflect the Bank's positions and should not be attributed to the World Bank in any way.

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[3] A number of the interventions have been subject to evaluations, as in Currie (2001) and Cunha, Heckmand, Lochner and Masterov (2005, CHLM from now on, for short). See the Annex for a summary of some of the conclusions from their work. An evaluation of programs in Brazil can be found in World Bank (2001), reviewed in section 5 at the end of this note.

[4] Alfred Marshall is probably one of the earliest references, as it can be inferred from the following passage: "The most valuable of all capital is that invested in human beings; and of that capital the most precious part is the result of the care and influence of the mother." A. Marshall (1890, paragraph VI.IV.11; epigraph in CHLM, 2005)

sector, financing sources and mechanisms); (c) the impact of ECD interventions (education outcomes in primary and secondary education and health outcomes).

It should be pointed out at the outset that we could find no reference to crime and violence in the studies related to Brazil. CHLM (2005, p. 49) mention, referring to the Perry and Chicago Child-Parent Center programs that "These and other studies of interventions for children from low-income families find that participants experienced increased achievement test scores, decreased grade retention, decreased time in special education, decreased crime and delinquency and increased high school graduation".[5] (CHLM, p. 85)

Again, when summarizing the main findings of the literature, they point out that "Both cognitive and non-cognitive abilities matter in determining participation in crime, teenage pregnancy, drug use and participation in other deviant activities" and "Non-cognitive skills (perseverance, motivation, self-control and the like) have direct effects on wages (given schooling), schooling, teenage pregnancy, smoking, crime and achievement tests. Both cognitive and non-cognitive skills affect socioeconomic success". (CHLM, p. 85)

This paper is organized as follows. Section 2 presents fragments of theoretical concepts and models that emphasize the formation of abilities and skills from the very early infancy as fundamental processes in allowing for future educational and skills performance. Section 3 provides a very brief presentation of the institutional setting surrounding the provision of ECD in Brazil, with a focus on ECE. Part of the information comes from official sources and part is drawn from recent research.[6] Section 4 focuses on the evolution of access to preschool educational services in Brazil, showing new results and analyzing the years 1996 and 2001 to 2004. Section 5 relies on recent research on a few of the existing empirical results of ECD interventions in the USA, the OECD, Latin America and Brazil and summarizes their results. The Annex contains excerpts from a survey on early childhood intervention in the USA with emphasis on the results of three programs.

2. THEORY [7]

"Abilities (and skills) are formed over time,
and the early periods in a child's life cycle are crucial for development".
(Cunha, Heckman, Lochner and Masterov , 2005, p. 6)

Economic theory support for investments in ECD has been granted on several grounds. Following the human capital (HC) approach, Carneiro and Heckman (2003) argue along two lines: first, returns to investment in early childhood will be higher than those made later because beneficiaries have a longer time span to reap the rewards; second because investments in human capital have dynamic complementarities.[8] Underinvestment in early

[5] The Perry and Chicago programs are described in the Annex at the end of this note.
[6] A list of official documents from federal and local governments can be found at the end of the present note.
[7] There are many useful conceptual reviews of ECD programs in the literature. A useful conceptual appraisal of early childhood interventions, which includes policy and operational issues among its concerns, can be found in Deutsch (1999).
[8] This view has been refined and extended by Cunha, Heckman, Lochner and Masterov (2005); see next.

childhood is due to a number o market failures such as liquidity constraints, information failures and externalities (Schady, 2005, p. 2).

Cunha, Heckman, Lochner and Masterov (CHLM, for short) have recently formalized the fundamentals of a HC theoretical variety in which HC investment exhibits both self-productivity and complementarity. Their view stresses the importance of both cognitive (innate and learned) and non-cognitive abilities in explaining schooling and socioeconomic success. Non-cognitive traits include motivation, persistence, time preference, and self-control, abilities that are themselves produced, and transmitted both within the family and community environments and by personal action: "Both genes and environments are involved in producing these abilities. Environments affect genetic expression mechanisms …. This interaction has important theoretical and empirical implications for skill policies. It suggests an important role for environment-enriching policies in fostering human skills"… "the traditional sharp distinction between acquired skills and genetically determined cognitive ability maintained in the human capital literature is no longer tenable. Abilities are multiple in nature. They are both cognitive and non-cognitive". (CHLM, p. 3)

According to the model, skill attainment at one stage of the life cycle raises skill attainment at later stages of the life cycle, something they called self-productivity.[9] Early investment, in turn, facilitates the productivity of later investment — a notion they dubbed complementarity. Early investments are not productive if they are not followed up by later investments, which is another aspect of complementarity. The authors frequently stress the point that returns to investing early in the life cycle are high. (CHLM, p. 2) We next summarize a few aspects of CHLM's theory from excerpts of their work as a way of motivation and introduction.

The authors argue that the modern literature on family influence on child outcomes places perhaps too much emphasis on family income constraints and heritability as the principal sources of parental influence on child development: "Credit constraints and family income influence on the schooling and earnings of children were recognized by additional research, as well as altruism, in forming the skills of children. Ability is treated as given by genetic factors and, in this line of work, **there is no distinction between early and late investment in children**". (CHLM, p. 2; emphasis added)

More recent research, in turn, "presents a richer picture of schooling, life cycle skill formation and earnings determination. It recognizes the importance of both cognitive and non-cognitive abilities in explaining schooling and socioeconomic success. These abilities are themselves produced by the family and by personal actions. The role of the mother is especially important".

This implies that "the traditional sharp distinction between acquired skills and genetically determined cognitive ability maintained in the human capital literature is no longer tenable. Abilities are multiple in nature. They are both cognitive and non-cognitive. Measured

[9] In CHLM's model the production function of skills depends on contemporary investments and accumulated skills, and displays increasing returns to scale. Their theory is aptly summarized in the following passage: "Skills produced at one stage augment the skills attained at later stages. This is termed self-productivity. It embodies the idea that skills acquired in one period persist into future periods. It also embodies the idea that skills are self-reinforcing". (CHLM, 2005, p. 7)

cognitive ability is susceptible to environmental influences, including in uterus experiences. So is measured non-cognitive ability. There are genetic components to both". (CHLM, p. 3)

CHLM use skills and abilities interchangeably throughout their work because environments, investment and genes affect both. According to them, "the human skill or ability formation process is governed by a multistage technology. Each stage corresponds to a period in the life cycle of a child.… An important feature of this technology is that the skills produced at one stage augment the skills attained at later stages". (p. 4-5). This implies that self-productivity is a critical feature of skill formation, a second one being complementarity: "Skills produced at one stage raise the productivity of investment at subsequent stages. In a multistage technology, complementarity also implies that levels of skill investments at different ages bolster each other. They are synergistic". (p. 5)

"Complementarity, self-productivity of human capital and multiplier effects imply an equity-efficiency trade-off for late child investments but not for early investments. These features of the technology of skill formation have consequences for the design and evaluation of public policies toward families. In particular, the returns to late childhood investment and remediation for young adolescents from disadvantaged backgrounds are low, **while the returns to early investment in children from disadvantaged environments are high"**. (p. 5, emphasis added)

An important — and perhaps controversial— implication, from the economic policy viewpoint is that "The empirically important market failure in the life cycle of child skill formation is the inability of children to buy their parents or the lifetime resources that parents provide, and not the inability of families to secure loans for a child's education when the child is an adolescent. Our analysis has major implications for the way policies should be designed in order to help low income and disadvantaged populations". (p. 6)

An interesting way of showing that policies that improve the early environments that shape ability will be more effective in the long run is given by CHLM in the following hypothetical experiment, designed to capture the essence of their argument: "Suppose two poor families participate in lotteries that are adjusted to have the same expected present value (at age zero of the child) but have different award dates. Markets are assumed to be imperfect in the sense that families cannot borrow against the future awards. Compare a family that wins the lottery in the child's adolescent years with a family that wins in the child's early formative years. The former child would lack all of the benefits of investment during the early childhood years that the child from the family that wins early would receive. The child from the late-winning family would be likely to have lower levels of cognitive and non-cognitive abilities than the child from the early-winning family. To the extent that investments are complementary and self-productive, the children of the early winner will be much more likely to attend college. Although none of the data we possess are as clean as the data generated by this hypothetical experiment, taken as a whole, they point in this direction". (CHLM, p. 29)

CHLM (2005) survey preschool intervention programs targeted toward disadvantaged populations and their measured effects.[10] They find that "the effects are generally consistent,

[10] Particularly their Section 6.1 on Early Intervention, beginning on p. 46. As noted, selected passages from their work can be found in the Annex at the end of the present note.

although in some cases they are weak. Generally, performance of children in school is improved in terms of less grade repetition, more graduation and higher test scores. Unfortunately, many of the evaluations of these programs do not follow children into late adolescence or adulthood. Interventions at younger ages seem to produce larger effects" (CHLM, p. 48)

The preceding passages summarize the theoretical state-of-the-art on ECE, constituting a solid support on which to base interventions. However, as the Annex will suggest, there are still gray areas arising from the results of past interventions so far analyzed — most of it coming from the USA.[11] Part of that is due to the fact that most initiatives are very recent, and both recipients and evaluation control groups are generally small. Still, the (partial and unfinished) evidence is convincing, as we will see later on. Part of the difficulties lies with evaluating costs and benefits in developing countries, and part has to do with the admittedly difficult issue of evaluating quality of the educational services — the provision of staff training and improvement of work conditions and facilities being the subject of most of the concerns. Before we turn to these issues, however, the next section provides a description of the prevailing institutional setting in Brazil, being followed in Section 4 by new results on ECE coverage in this country.

3. THE INSTITUTIONAL SETTING OF ECE IN BRAZIL[12]

Since when the Brazilian Constitution was enacted in 1988 — and even before that date, as early as 1985 —, the provision of daycare and preschool centers has been formally part of the educational system. But in practice there is still a long way to go, as witnessed by advances and provisions in the new and not yet approved FUNDEB — *Fundo de Desenvolvimento do Ensino Básico*. FUNDEB, an extension of the FUNDEF[13] is an important step in enforcing and funding daycare and preschool activities.

Before 1988 these services were part of the Social Assistance policies system. The whole system targeted at pre-primary education has since then been organized in a regime of collaboration between Federal (regulatory and coordination policies, plus technical and financial support), State (contribution to the implementation of policies and directives) and Municipal (primary or direct role) governments.

Thus, within the structure and organization of the Brazilian educational system, the federal government is responsible for legislating on the guidelines and standards for national education. The federal government is also responsible for coordinating the formulation and

[11] See also OECD (2001) for a lengthy presentation of 12 programs on early child education and care. A brief summary of the findings and recommendations arising from this work can be found in section 5, below. OECD's survey, however, seemed to be more descriptive than analytical to this reviewer.

[12] Throughout this paper we use ECE, for Education and ECS for Services, in general.

[13] FUNDEF binds each state and municipality to invest at least 60% of the resources designated for education to elementary education. Through FUNDEF, each Brazilian child of elementary school age is guaranteed a minimum amount of resources per year (R$315 in 1999). If state and municipal revenues cannot meet this minimum, the federal government is committed to make up the difference. Some states began to implement this new mechanism of financing elementary education in 1997; all states are expected to have implemented it by now. (World Bank, 2001, p. 47)

implementation of the National Plan of Education, and for providing technical and financial support to states and municipalities.

In practice, the collaboration among the three levels of government has not always been effective. In general, but not always in practice, Health and Social Assistance have been made responsible for policies aimed at the 0-5 years of age group of children. Early Childhood Education (ECE) comprises the first level of basic education, or pre-primary education, the second being the mandatory fundamental 8 years and the secondary school (next 3 years).[14] The new FUNDEB aims precisely at reinforcing and providing resources to ECE to be distributed to local governments. Its future is uncertain to this date, though.[15]

It should also be pointed out that children aged 0 to 6 years have benefited — indirectly, in some cases — from the following programs, implemented at the federal level: (a) *Benefício de Provisão Continuada* (Secretaria de Estado de Assistência Social, MPAS — Ministério da Assistência e Previdência Social): granted to individuals with disabilities and senior citizens (67 and older) whose per capita family income is less than 25% the minimum salary[16]; (b) *Bolsa Família*, a program that merged three previous federal programs: *Bolsa Alimentação*, to improve nutrition[17] and health services (Ministry of Health); *Merenda Escolar*, to improve nutritional needs of students in preschools and primary education who attend public and philanthropic schools, day care centers not included (School Meals, Ministry of Education — MEC); and *Bolsa Escola*, a program of cash transfers conditional on families keeping their children enrolled in schools.

The next sub-sections deal with issues related to the institutional setting of ECE. They cover the following themes: (3.1) quality of services provided and curricular guidelines; (3.2) funding sources; (3.3) the existing fragmentation of activities; (3.4) initiatives to improve better integration and cooperation among agents; (3.5) accreditation; and (3.6) at the end, we discuss two non-formal ECD programs.

3.1 Quality of ECE

The 1990s witnessed significant increases in the amount of services provided to children aged 0 to 6, as decentralization began to work and the creation of NGOs and councils

[14] The age for enrollment in mandatory education (primary school) is seven years, although students may enroll as early as 6 years of age. This has been formalized by new legislation, enacted in 2006.

[15] The necessary legislation has not been approved by Congress so far.

[16] The program benefits children indirectly, as estimated by a study made at IPEA: "there are 3,171,760 children aged 0 to 6 whose families have a monthly per capita income lower than ¼ of a minimum salary. In 2000, 54,614 children with disabilities received the benefit. This corresponds to 1.7% of all children aged 0 to 6 at this income-bracket. In Brazil, it is estimated that 10% of the population is disabled." (UNESCO, 2003, p. 5)

[17] As to the nutritional status and future academic and professional performance in Brazil, Paes de Barros and Mendonça (2006) evaluated the impacts of the nutritional status of children aged 0 to 6 and their results on future (i.e., as adults) academic and professional. Their analysis shows that, despite the fact that results confirm the importance of nutrition in preschool — for instance, the impact of school attendance on child's height (given his/her age), and on child's weight (given his/her height) has the expected sign and is statistically significant — the impact of *merenda escolar* on the nutritional status did not result significant. They also show that there is no evidence that time spent in school is important to define the nutritional status of children. Concerning the family environment, their results highlight the importance of the mother's education level in reducing the probability that a child be undernourished. See also World Bank (2001).

for social control began to provide support in early educational services (UNESCO, 2003).[18] But a (unknown) good part of it is made of non-formal services, the quality of which is virtually impossible to evaluate — except with the help of direct observation and in-depth research.[19]

A recent study evaluates that there are great difficulties in terms of access to data and information on ECS. One of the problems has to do with the concept of quality,[20] which may be defined (and, therefore, the service evaluated) according to conceptual perspectives that are necessarily relative and perhaps temporary.[21] The second problem is related to the fact that there is no national synthesis of integrated quality-related indicators for early childhood services — something that a new set of official parameters enacted in 2006 (see below) identified and the acceptance of which is deemed a priority. In the third place, any methodology aimed at evaluating quality should be flexible enough to take into account the context of great regional diversity, which is one prominent characteristic of Brazil's educational system. And, finally the disconnected, conflicting and fragmented manner in which policies and programs are implemented makes it even more difficult to describe and analyze the quality of these services. (UNESCO, *op. cit.*, 2003)

The regulatory agency for national education is the National Council of Education, which issues National Curricular Guidelines[22] to daycare centers and preschools. These guidelines are complemented by additional regulation from state and municipal school systems at the local level. The curricular guidelines are very general in nature and are based on the principles established in the National Educational General Act, according to which each school should develop its own pedagogical project with the participation of teachers. The Ministry of Education (MEC) encourages the use of the National Curricular Reference for ECE (1998). Although the use of this Reference is not mandatory, it defines the curricular guidelines in detail. The MEC has fostered teacher training in several states and municipalities. In 2006 a new set of (very general) parameters was issued by the MEC.

UNESCO (2003) summarizes comments on the official guidelines as follows:

(i) It is mandatory that curricular guidelines be followed by all daycare and preschools, both public and private. They serve as the foundation for the pedagogical proposal each institution must prepare based on the following principles: (a) the ethical principles of autonomy, responsibility, solidarity and respect for the common good; (b) the political principles of citizenship rights and responsibilities, the exercise of critical reasoning and respect

[18] See the next section for a quantitative analysis.

[19] From the introduction of a recent appraisal we learn that "There are no available data concerning either services provided to children from birth to six years of age in non-formal services or the different modalities existing in different regions of the country and in the municipalities (UNESCO, 2003, p. 2). This is not exactly true, as it will be seen in section 5.

[20] "Several different scales have been developed for assessing the quality of childcare and preschool. These scales have two components, one that evaluates 'structure' (measures such as teacher/pupil ratios, class size, etc.) and one that evaluates 'classroom processes' (less quantifiable: nature of interactions, layout of classroom materials, etc.)." (Currie, 2001, p. 227) The two types of measures tend to be correlated.

[21] The same aspect is emphasized in OECD (2001).

[22] The National Curricular Guidelines for ECE were formulated by the federal government and published by the Basic Education Division (CEB) of the National Council of Education (CNE). They were established by Legal Opinion CNE/CEB 22/98 and by Resolution CNE/CEB 1/99.

for democracy; (c) the aesthetic principles of sensitivity, creativity, playfulness, quality and diversity of artistic and cultural manifestations.

(ii) The existence and use of these guidelines (see below for "new parameters") are especially relevant to ECE, both at the public and at the private level, and they can be seen as a quality-related factor and indicator, since they both orient pedagogical proposals and foster their formulation. These guidelines also establish paradigms for the design of ECE programs and services.

(iii) Integrated within the body of principles, criteria and procedures defined by the National Curricular Guidelines for Basic Education, the formulation of these guidelines is a crucial measure for the integration of services offered to children from birth to six years of age within the structure and operation of the educational system.[23]

In parallel, the Ministry of Education produced and disseminated the non-mandatory Curricular Referentials for Early Childhood Education. Teacher training activities were developed from 1999 to 2002, so that references could be used by them. This training program included some of the teachers working at municipal schools in a program called Parameters in Action.

Different responsibilities were assigned to the different levels of the government. The school systems of the municipalities are in charge of providing ECE services and primary education on a priority basis. According to the spirit of cooperation that should prevail in educational policies, the Ministry of Education, jointly with the State Councils of Education and representatives of the National Union of Municipal Councils of Education, published the "Subsidies for the accreditation and operation of early childhood education establishments".

In addition to these initiatives, municipalities are organizing their own systems and regulations for ECE. A survey carried out in 2000 concluded that 1,784 municipalities had Municipal Councils of Education. Although a national evaluation of the operation of these agencies is not yet available, it seems that they are increasingly active and that there is greater interconnection among them through the National Union of Municipal Councils of Education.[24]

The increasing organization and operation of the Municipal Councils of Education, as well as the specific regulations for ECE resulting from them point to the fact that ECE is being progressively integrated into the school systems. On the other hand, it points to the building of a consensus in terms of understanding quality, as well as the process of defining quality as being decentralized and participatory. In this respect two issues reflect imprecision in school regulations, resulting in less than best practices:

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[23] The National Curricular Guidelines for Early Childhood Education were supplemented with Operational Guidelines by means of Legal Opinion CNE/CEB 4/2000, which deals with: (a) Establishing links between early childhood education establishments and school systems; (b) Pedagogical proposals and school regulations; (c) Teacher and staff formal qualifications; (d) Physical spaces and supplies.

[24] Also from UNESCO's 2003 report. The Legal Opinions and Resolutions of the National Council of Education can be understood as actions that demonstrate how quality is defined; likewise, municipal regulations systematize quality criteria and consolidate national guidelines. In practice, evaluation of quality is a more difficult endeavor.

(a) The ill-defined nature of the so-called "equivalent to daycare establishments". The legislation states that educational services for children aged 0 to 3 may be provided by daycare centers or equivalent establishments. This means that "equivalent establishments" are part of the educational system, and subject to its regulations. But there has been an increase in the number of services available for children aged 0 to 3 outside the school system, in the form of alternative and informal programs, generally linked to the Social Assistance sector. They function in community or domestic spaces, require no formal qualifications and are offered to a vulnerable population with no access to daycare or preschool. It is feared that these services do not always meet minimum standards of quality, been characterized as "poor education to the poor" — a concern typical of rich countries as well (see OECD, 2001, *passim*). This weakens the already weak link between the Social Assistance sector and the Education sector, as well as the management and funding of activities directed to ECD (UNESCO, 2003).

(b) The somewhat ambiguous nature of education requirements for teachers, principals (*diretores*) and other school staff members. Teacher education requirements are spelled out in article 62 of the National Educational General Act. But the same does not apply to the education requirements of principals (whether secondary level of education, Pedagogy course or graduate education), or of requirements from the so-called "assistant, aide or monitor". In some municipalities all it is required from the *assistente* is a primary education degree (sometimes, not even that) — despite the fact that education specialists suggest that only professionals with high-school degrees should be entitled to this kind of work (*Ibid*).

Still on the quality issue, it should be mentioned that some of the goals and targets of the National Plan of Education, although not yet attained, aim at improvement and quality assessment of programs. The following are especially important measures:

- related to implementing curricular guidelines;
- to formulating minimum infrastructure standards for the operation of daycare and preschools;
- to defining mechanisms for cooperation involving the education, health and the social assistance sectors;
- related to the establishment of national formal qualifications and training program for professionals in the area of ECE. (UNESCO, 2003, p. 9)

To sum up, the National Educational General Act (1996) required college degrees (in four-year teacher training programs) for ECE, primary and secondary education. However, it is still deemed acceptable a minimum level of teacher training for those working in ECE and in the first four years of primary school. This minimum training is offered in specific secondary level courses. Principals and specialists in all three basic education levels should have a college or post-graduate degree in Education.[25] Since there are teachers who still do not have the qualifications required by law, the National Plan of Education 2001-2011 established, as a goal, a National Program for the Qualification of ECE Professionals, in order to ensure that, within five years, all principals of institutions at this level will have secondary school degrees, and,

[25] According to the results of the School Census 2001, 69.2% of the teachers working in ECE had a secondary degree certificate and 20.8% had a university degree, but there is a huge regional variance around these means: teachers with college degree correspond to only 7.1% of the total in the Northeast. (UNESCO, op. cit., p. 14)

within ten years, university degrees. All teachers must also complete secondary school within five years, and 70% of those teachers must have college degrees within ten years.

These deadlines are clearly difficult to meet. Qualification requirements imply a return to school for ECE professionals who do not have college degrees. This involves special supplementary programs as well as in-service training programs (UNESCO, 2003, p.15).

Another problem is that undergraduate courses in Pedagogy do not offer specific qualifications for ECE. Although national legislation provides for the possibility of in-service training of teachers, such possibility has not been regulated. Each local program establishes its own criteria and training programs, which do not necessarily assure the qualifications deemed necessary. (UNESCO, *ibid*, p. 15)

3.2 Official ECE Funding

First of all, note that there is no information on the financing of informal services.[26] Public revenues (taxes and social contributions) are targeted to the maintenance and development of educational services in the following proportions: 18% of resource originated at the federal level (taxes); 25% of tax revenues plus transfers are applied by states and municipalities. In addition, states and municipalities are targeted to mandatory 8-year *fundamental* education (primary, eight years).

In 1998 the Fund for the Development of Primary Education and Valorization of Teachers (FUNDEF) was created in each unit of the Federation to provide funding to municipalities. The funds represent 60% of the targeted resources and are distributed to state and municipal systems according to the number of students enrolled in primary education in each system. It is expected that the municipalities are expected to spend any remaining resources in ECE. This is not always accomplished because sources from many municipalities are insufficient and FUNDEF resources are themselves frequently insufficient for the financing of primary education.

One strategy often used to increase the supply of services is the transfer of public resources to private institutions, by means of formal agreements: 20% of the 24,907 private establishments registered in the ECE Census 2000 have formal agreements with the public sector, which constitute their main source of financing.[27] (UNESCO, 2003) It is fitting to

[26] But note also that results from non-formal and NGO-operated ECD programs in Brazil and other countries show that these programs are beneficial and can be highly cost-effective. Relying on flexible formats and incurring lower administrative costs, successful "Non-formal and NGO-operated ECD programs provide a variety of services offered in a nonstandard way. These programs typically rely heavily on community participation and are designed to suit local needs and conditions. The range of services includes activities such as improving mothers' parenting skills and improving access to early child development by bringing ECD services to children's homes". (World Bank, 2001, p. 44)

[27] Social Assistance also targets resources to both public and private ECE institutions, usually aiming at poor children (the standard being families whose per capita income is less that ½ of one minimum salary). The Union pays, for each child enrolled, R$ 8.51 a month for part-time attendance (around 4 hours a day) and R$ 17.02 for full-time attendance (around 8 hours). These payments originate from the National Social Assistance Fund, and are made to the State and Municipal Funds in the sector. The total resources annually spent over the last few years amount to approximately R$ 250 million, serving 1.66 million children (figures presumably from 2002).

observe that the trend towards private services goes against the trend registered in OECD countries. (see OECD, 2001, as noted below)

The Ministry of Education also provides financial assistance to the municipalities, although resources are extremely limited (approximately 15 million *reais* per year; data are presumably 2003 figures). These resources finance teacher-training activities and the purchase of pedagogical material for students, and benefit only some of the municipalities with low human development rates. These resources benefit only municipal preschools and do not include daycare. In addition, public and philanthropic preschools (but not daycare centers) were up to 2002 included in the federal School Meal program, on the basis of R$ 0.06 per school-day, per child. This amount corresponds to less than half the amount paid for public school primary education students (R$ 0.13). It is estimated that R$ 45 million are being spent annually on school meals for children attending preschool. (UNESCO, 2003, p. 13)

Among the informal (or non-formal) services provided for small children in Brazil, emphasis should be placed on the NGO *Pastoral da Criança* (Children's Pastoral Program), associated to the Catholic Church, whose work includes regular weight checks and nutrition guidance, teaching on how to use a homemade solution for diarrhea and information on general aspects of child development.[28]

3.3 Fragmentation of Activities

The development of educational programs for children aged 0 to 6 has been characterized by fragmentation and by the lack of a national project giving priority to the provision of services that assure the protection of the children's rights. In response to legislation and to international commitments signed by Brazil, various programs and services have been established in different ministries. However, there is no connection among programs belonging to different sectors, and to older programs and services, resulting in the overlapping and repetition of programs in different ministries. These programs were established fragmentarily, with no consistent and interconnected information systems and no processes intended to assess the impact of specific actions, services and programs on the improvement of the quality of life of the population. This duplication and fragmentation of activities has been observed both within and among the ministries for a wide variety of programs and actions.

The most evident type of fragmentation occurs in the areas of education and social assistance. The specific responsibilities of each of these areas are still not clear. This type of lack of integration does not happen only at the federal level, but in many municipalities as well. This is due to the fact that ECE in Brazil has developed along a number of different lines: children from the more affluent families and/or of ages closer to school-age were served by the school system, in preschools and kindergartens, on a part-time basis. Services to children from poorer families or those in the 0 to 6 age-bracket were provided by the social assistance area, with special emphasis given to the function of child-care.

[28] A large share of their resources comes from media campaigns, from the Ministry of Health and from the Ministry of Social Security and Social Assistance. In 2000, the *Pastoral da Criança* program monitored 1.5 million children between the ages of zero and six years, counting with the work of over 130,000 volunteers from all over the country. (UNESCO, op. cit., p. 13) See below for a fuller description.

As mentioned, since the 1988 Constitution was enacted daycare centers have been recognized as educational services. But only in 1996 did the National Education Guidelines establish the requirement that all daycare and preschools should be integrated into the education systems. Brazil is still suffering from a lack of definition in terms of ECE because although it has now been recognized as the first stage of basic education, the daycare centers and preschools are still not granted adequate resources in the overall education budget: the Ministry of Social Security and Social Assistance remains the main source of resources for financing these services. The new FUNDEB aims at easing presents financing constraints.

As to activities at the local levels, it is difficult to generalize. Over the recent past some municipalities have been implementing administrative reforms in order to promote articulation between government actions, but there is no consolidated information on experiments of this type that give priority to children aged 0 to 6. (UNESCO, *ibid*, p.15)

3.4 Initiatives for the Promotion of Cooperation and Integration of ECE among Ministries

Lack of coordination and fragmentation of activities were identified as a constraint to efficient actions on ECD, as seen. In this sense, an Early Childhood Committee was created by presidential decree in 2000 with the objective of "articulating, coordinating and supervising the actions of federal policies focusing on early childhood development" (December 27, 2000). This committee is an integral part of the Solidarity Community Program,[29] and subordinated to the Civil Office of the Presidency of the Republic.[30]

In 2001, the Committee underwent structural and operational changes that resulted in the transformation of its working concept. There were plans for publishing a "Reference Guide for Municipal Managers on Inter-Sector Policies for Childhood", for establishing committees for early childhood in the municipalities participating in the Solidarity Community Program, and for the training and qualifying of managers in the development of public policies concerning children from birth to six years of age.

In 2002, the executive coordination of the Early Childhood Committee approached forums working with local integrated sustainable development, trying to raise consciousness concerning the creation of local committees for the articulation of the actions directed towards children from birth to six years of age. By December 2002, 394 Brazilian municipalities had

[29] The Solidarity Community (*Comunidade Solidária*) is a federal public program established during the administration that ended in 2002 that proposed new ways of fighting poverty and social exclusion by creating mechanisms of integration and coordination of public social programs in the poorest areas of the country, while mobilizing civil participation in this endeavor. It aimed at including the poorest segment of the population in an on-going social and economic development process through an ambitious nationwide mobilization of both government and civil society.

[30] The member composition of the Committee was as follows: one Executive-Secretary for the Solidarity Community, two representatives of the Ministry of Health, three of the Ministry of Education, one of the Ministry of Social Security and Social Assistance, one of the Ministry of Culture and one of the Public Prosecution of the Union. The Committee also included two representatives of non-governmental organizations and a representative of each international organization involved with projects in the area of Early Childhood (such as UNICEF, UNESCO, and the World Bank). Administrative support and the necessary means for carrying out the Committee's projects should be provided by the Executive Secretariat of the Solidarity Community Program, an executive coordination having been created to take charge of the implementation of the actions.

established Local Committees for Early Childhood, or were conducting studies aimed at their implementation, and the "Reference Guide for Municipal Managers" was published.

The constitution of the National Committee for Early Childhood, although characterized as an initiative aimed at creating articulation among different actions, was not included in the federal government's priority agenda until 2002. Among the factors that have contributed to the failure in attaining the goal of articulating policies and actions that benefit children, we underscore: the internal fragmentation in the Ministries, the lack of a national project for children aged 0 to 6; and committee representatives of the same hierarchical level, who did not have decision-making power in their respective Ministries. The Committee was extinguished in early 2003.

The educational policy program of the federal administration that took office in January 2003 included the creation of the Childhood and Adolescence Council, subordinated to the Ministry of Education and formed by representatives of the Ministries of Education, Health, Social Development and Justice. This council would aim at the establishment of an integrated policy for childhood and youth. However, no action was announced during the first month of the new administration. (UNESCO, *op. cit.*, p. 17)

3.5 A Note on ECE Accreditation

Following the need to define quality standards for daycare centers and preschool, the Brazilian government (MEC, 2006)[31] recently issued a set of rules for this purpose establishing patterns of reference.[32] According to a survey on the regulation of ECE carried out by Municipal Councils of Education in twenty state capitals, the requirements for the operation of daycare centers and preschools are concentrated on five issues:

1. the existence of a pedagogical proposal, a curriculum and/or school regulations;
2. education requirements for teachers and staff members;
3. characteristics of the physical space and basic equipment;
4. teacher/child ratios;
5. connection between daycare and preschools and the school system.

In addition to defining criteria, the municipalities, in implementing the process of daycare and preschool accreditation and of granting authorizations, develop procedures in common with the Council of Education and the executive agency in the area (the Secretariat of Education). These procedures aim at ensuring that the predefined level of quality will be attained. Since authorizations are granted for a limited period of time, their renewal may function as a process of monitoring. However, the development of strategies, tools and systems for monitoring quality is a critical aspect of the policy. More detailed data on the supervision of policies and services at municipal level are necessary.

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[31] The MEC defines infantile education as encompassing the 0 to 6 years range, according to Law 11.114 (16.05.05) and Law 11.274 (06.02.2006), which also permit that 6-year olds be included in the fundamental stage (before that, from 7 to 14) following guidelines from the *Conselho Nacional de Educação /Câmara de Educação Básica* (*Parecer* nº 18, 15.09.05) with respect to this inclusion.

[32] See also "*Política Nacional de Educação Infantil: pelo direito das crianças de 0 até 6 anos à educação*" (BRASIL, MEC, 2005a).

Although a national system for the evaluation of daycare and preschool services does not exist, there are significant efforts aiming at defining criteria to evaluate the quality of ECE (see below). This progress is evident in the Resolutions of the Councils of Education: in the way they are formulated, scope and content. (UNESCO, *op. cit.*, p. 8)

It is an attribution of state and municipal education councils (*Conselhos Estaduais e Municipais de Educação*) to establish norms and regulations aiming at ensuring obedience to the law. This includes accreditation and evaluation of working/functioning of pre-primary education (*Educação Infantil*), both daycare and preschool. However, as mentioned, little is known about actual accreditation and the quality of center-based, NGO or family/community daycare and preschool activities.

It is also incumbent upon the Municipal Secretaries of Education to support financially and technically the pre-primary education institutions *conveniadas*, be they philanthropic, confessional[33] or communitarian, so that they attain quality patterns compatible with legal requirements. Besides supervising all concerned institutions, their tasks include guaranteeing decent infrastructure, appropriate feeding and the provision of pedagogical material.

The actual list of functions committed to the State Secretaries is so large that it is doubtful whether they are able to fulfill all the requirements, not to speak of the basic ones (such as accreditation of centers with acceptable quality standards).

The parameters indicate that time spent by children on ECE institutions should not exceed time spent with the family. Part time should be at least four hours per day, while full-time implies a maximum of ten hours per day. Children should never be left alone. Ratios of children per education professional vary according to age in the following schedule: one professor for each 6-8 children aged 0 to 2; idem, for each 15 children aged 3; idem, for each 20 children above 4.

In addition to that, as already mentioned, management of ECE institutions is the responsibility of professionals who should have at least secondary level certificates in the *Escola Normal* modality and, preferably, university Pedagogy diploma. Professionals who are in direct contact with children are teachers who should have at the minimum level the *Escola Normal* (*nível médio*).

3.6 A note on NGO and informal ECS[34]

Although recognizing that the focus of this note is on ECE, any picture of the institutional setting related to ECD in Brazil would be incomplete without reference to two well-known NGO initiatives on ECS — due to the obvious links among early education and child care explicit in their activities —, something which we attempt to do next. Numerous NGOs have supported and implemented ECD services in Brazil. Although the potential for these groups to expand their services to young children varies, NGO involvement has been a

[33] "*Grupos de pessoas físicas ou por uma ou mais pessoas jurídicas que atendem a orientação confessional e ideologia específicas*" Brasil, MEC (2006, p. 28).
[34] Based on World Bank (2001).

key element in encouraging community participation. Two such organizations are described below.

The first is the *Pastoral da Criança* (Pastoral Letter to Children) is a social action agency operated by the National Conference of Brazilian Bishops (CNBB) founded in the early 1980s. All its activities are community- and family-based, and community leaders are trained to mobilize families to combat child mortality and improve the quality of their lives. The function of the leaders is to monitor pregnant women and poor children up to age 6 and to teach mothers and other family members about basic hygiene, nutrition, and education, giving particular emphasis to nutritional surveillance and overall child development. The thousands of leaders each visit about 20 nearby households, to support and monitor them. About 75 percent of its resources are managed directly by the various dioceses. (World Bank, 2001, p. 38)

The second NGO is the Association Representing the Paulo Englert Movement for Popular Education (AMEPPE) founded in the early 1980s. AMEPPE's programs are intended to achieve the following objectives: (i) Help improve the quality of services provided for children and adolescents in the state of Minas Gerais and contribute to the training of educators and specialists connected to this area; (ii) help define, implement, and evaluate public policies relating to children and adolescents issues; and (iii) organize documentation and data, publish teaching materials, and generate information relating to the organization's activities. AMEPPE's goal is to contribute to the education of children and adolescents and to improve their quality of life by providing basic and advanced training for teachers in community day-care facilities.

Educational activities in AMEPPE's programs are undertaken in five areas: (1) provision of schools, daycare facilities, youth centers, and programs for street children of both sexes and of projects for community development; (2) teacher training for child education; (3) documentation, research, and production of publications; (4) communications and publication of information; and (5) action on public policy. In 1995 AMEPPE provided in-service training, courses, and workshops for 1,300 teachers and specialists in 278 day-care facilities, NGOs, and government agencies in Minas Gerais. (World Bank, *Ibid*, p. 39)

4. ACCESS TO EDUCATIONAL SERVICES IN BRAZIL

As it is well known, municipalities provide the majority of daycare and preschool services in Brazil. From the 2001 School Census we learn that, despite regional differences, public schools provide most of educational services to children: 62.4% of all daycare and 74.6% of preschool. Nearly 97% of enrollments in public daycare are in the municipalities and 91% of the enrollment is in public preschool. (UNESCO, 2003, p. 11)

Access is very unequal, as coverage increases with family income in both daycare and preschool education. Besides that, poverty rates are higher among children: "According to data collected in 1999, 42% of the children aged zero to six are members of families whose per capita income is lower than ½ a minimum salary. This percentage is much higher than the poverty rate for the population in general". (UNESCO, *ibid*, p. 12)

Next we show evidence on the increasing coverage of educational services in Brazil over the period 1996 to 2004[35]. Micro data from the PNAD (*Pesquisa Nacional por Amostra de Domicílios*, the Brazilian National Household Survey) were assembled for this purpose. The results are presented in the following table.[36]

The table shows the numbers of children attending daycare and preschool as well as the totals in the relevant age brackets in 1996, to provide some perspective and in 2001 to 2004, to illustrate the recent evolution. In all cases totals for Brazil and the main regions are displayed, as well as separate results for the states in the Southeast region (*São Paulo, Rio de Janeiro, Minas Gerais and Espírito Santo*). These states were singled out because relative school attendance in the two rich states of São Paulo and Rio de Janeiro is presumably higher than averages for the remaining states and regions. The table also shows the coverage rates in each region and state.[37]

From the Brazilian total line we learn that attendance to daycare services almost doubled between 1996 and 2004: from 0.88 to 1.55 million children aged 0 to 3, with most of the change occurring between 1996 and 2001. Since the population of children in the 0 to 3 years age bracket did not increase much — remaining in the neighborhood of 12 million throughout the period analyzed — the gain in coverage was remarkable: from 7.4% to 13.4%. Still, the proportions are low compared to other countries.

The national averages mask deep regional differences, as mentioned. Coverage of daycare is lowest in the less urbanized states of the North region (only 5.7% in 2004) where changes in demographic patterns have been intense — as shown by the large increase in the number of children in the relevant age-brackets. Still, the table shows that only approximately 70,000 children in the Northern region were enrolled in daycare centers in 2004.

The also less urbanized Center-West comes next, displaying coverage rates that range from only 4.7% in 1996 to still low 8.8% in 2004. The Northeastern region, with a 11.8% coverage in 2004, is in third place. The rate attained in 2004 is similar to the coverage rate in the state of Minas Gerais (12.2% in 2004), which belongs to the (on average, richer) Southeast.

The richest states of São Paulo (17.5% in 2004) and Rio de Janeiro (18.2% in 2004) display similar rates of coverage, also on the same order of magnitude attained in the rich states of the South (regional average of 18.5% in 2004). Note that both in São Paulo and in the Southern region coverage rates for daycare increased very fast from 1996 to 2004 — but not in Rio de Janeiro, which already had the highest rates as early as 1996. In all the three cases we observe a jump in 2004, which also characterizes data for the state of Minas Gerais. This coverage increase is due to increased enrollment, rather than to demographic change. Information on daycare coverage and respective changes over time are also shown in Figure 1, below.

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[35] The choice of 1996 as the initial year in our analysis is somewhat arbitrary. We suspect that information before that date did not permit to separate daycare and preschool enrollment.

[36] We thank Eduardo Zilberman for providing competent research assistantship for this section, without compromising him with the analysis and conclusions that follow.

[37] One feature of our definition of coverage should be spelled out, because it differs from other head counts: we excluded from both numerator and denominator the students already enrolled in primary education. This has the effect of reducing the numbers of children especially those aged 6 years and, to a lesser extent, those aged 5 years.

Turning next to preschool coverage, Table 1 shows that, contrary to children aged 0 to 3, the demographic group of children aged 4 to 6 increased (but not much) between the dates here considered: from 8.5 million in 1996 to 9.2 million in 2004 (total for Brazil). Attendance increased much faster, though — but not as much, in relative terms, as in the case of daycare. As a result, coverage ratios went continuously up from 51.1% in 1996 to 67.3% in 2004, when 6.2 million children aged 4 to 6 attended preschool.

Table 1: Pre-primary School Attendance in Brazil — Absolute Numbers and % Coverage, Regions and Selected States, 1996 and 2001-2004

0 to 3 YEARS (Daycare)						4 to 6 YEARS (Preschool)					
BRAZIL	**1996**	**2001**	**2002**	**2003**	**2004**	**BRAZIL**	**1996**	**2001**	**2002**	**2003**	**2004**
Attend	880062	1313088	1391851	1348698	1546897	**Attend**	4355287	5627821	5696709	5825085	6179315
Total	11837151	12400744	11930734	11526795	11544781	**Total**	8530087	9022613	8920028	8894181	9177029
	7,43%	10,59%	11,67%	11,70%	13,40%		51,06%	62,37%	63,86%	65,49%	67,33%
NORTH						**NORTH**					
Attend school	**1996**	**2001**	**2002**	**2003**	**2004**	**Attend school**	**1996**	**2001**	**2002**	**2003**	**2004**
	41828	64336	68280	67399	69843		229226	351391	375581	398509	502575
Total	709940	888602	885085	914281	1228811	**Total**	473859	621872	645696	668064	945774
	5,89%	7,24%	7,71%	7,37%	5,68%		48,37%	56,51%	58,17%	59,65%	53,14%
NORTHEAST						**NORTHEAST**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	272343	420743	421284	412762	433423	**Attend**	1517475	1895928	1871210	1933605	1978624
Total	4036726	3994868	3929789	3747056	3683659	**Total**	2833425	2837225	2735239	2787048	2733335
	6,75%	10,53%	10,72%	11,02%	11,77%		53,56%	66,82%	68,41%	69,38%	72,39%
State of MINAS GERAIS						**State of MINAS GERAIS**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	62605	113653	118007	103137	134722	**Attend**	413850	584516	594474	589559	614623
Total	1220699	1288810	1232370	1150900	1103534	**Total**	919737	967020	969315	921498	902224
	5,13%	8,82%	9,58%	8,96%	12,21%		45,00%	60,45%	61,33%	63,98%	68,12%
ESPÍRITO SANTO						**ESPÍRITO SANTO**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	22409	34687	27993	34247	33362	**Attend**	85080	102717	103557	106557	121228
Total	206331	257450	212233	199301	203468	**Total**	163025	170276	159531	164119	176202
	10,86%	13,47%	13,19%	17,18%	16,40%		52,19%	60,32%	64,91%	64,93%	68,80%
RIO DE JANEIRO						**RIO DE JANEIRO**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	95007	118274	116492	112741	136913	**Attend**	405134	498514	469387	495529	517288
Total	831772	949161	804192	794657	753352	**Total**	604048	689153	642016	651809	656444
	11,42%	12,46%	14,49%	14,19%	18,17%		67,07%	72,34%	73,11%	76,02%	78,80%
SÃO PAULO						**SÃO PAULO**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	207099	296652	353002	330283	395723	**Attend**	924603	1242101	1314294	1284541	1412196
Total	2297553	2379391	2430482	2276956	2256137	**Total**	1671634	1838433	1893582	1856441	1926416
	9,01%	12,47%	14,52%	14,51%	17,54%		55,31%	67,56%	69,41%	69,19%	73,31%
SOUTH						**SOUTH**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	138741	202849	213889	221016	266047	**Attend**	528451	633110	631240	675217	669048
Total	1686698	1716650	1571752	1566858	1438900	**Total**	1269828	1252053	1222480	1203846	1201203
	8,23%	11,82%	13,61%	14,11%	18,49%		41,62%	50,57%	51,64%	56,09%	55,70%
CENTER-WEST						**CENTER-WEST**					
	1996	**2001**	**2002**	**2003**	**2004**		**1996**	**2001**	**2002**	**2003**	**2004**
Attend	40030	61894	72904	67113	76864	**Attend**	251468	319544	336966	341568	363733
Total	847432	925812	864831	876786	876920	**Total**	594531	646581	652169	641356	635431
	4,72%	6,69%	8,43%	7,65%	8,77%		42,30%	49,42%	51,67%	53,26%	57,24%

Regional differences were as pronounced as in the case of daycare, but with less regional variance. Coverage is lowest in the North (53.1% in 2004), but now, surprisingly followed by the South (55.7%) and the Center-West in third place (57.2%). Coverage ratios in Rio (78.8%) and São Paulo (73.3%) were the highest in the country in 2004. But they are now closely followed — again, surprisingly — by the Northeastern region, with a 72.4% mark. Figure 2 shows the information on coverage rates and changes over time for preschool attendance.

Figure 1: % Daycare Coverage Rates, Children Aged 0-3

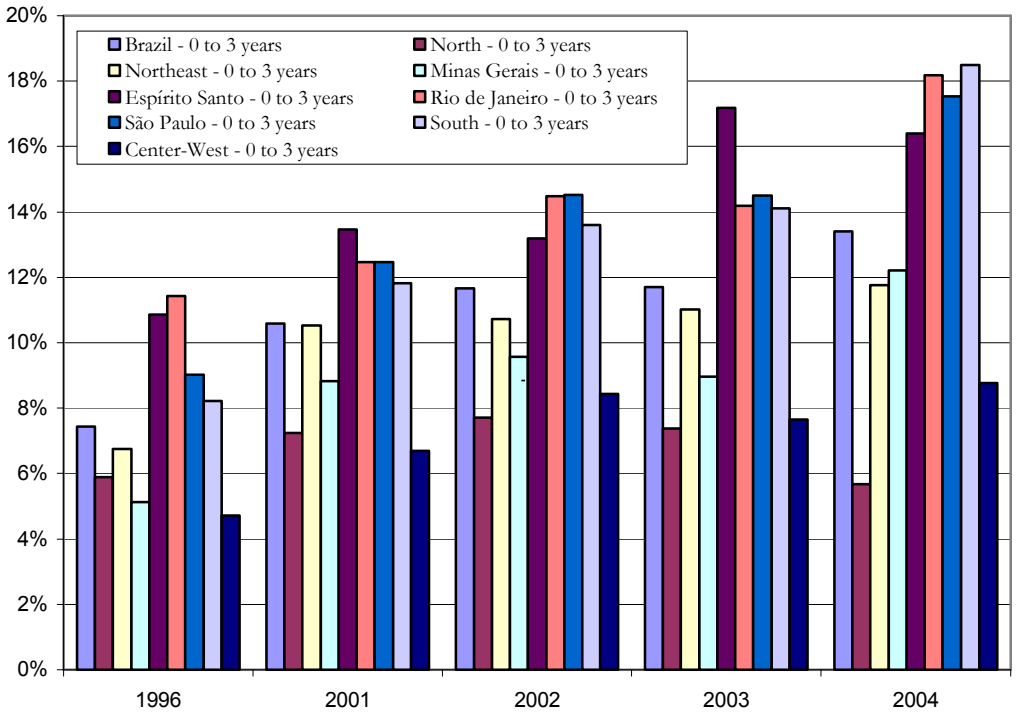
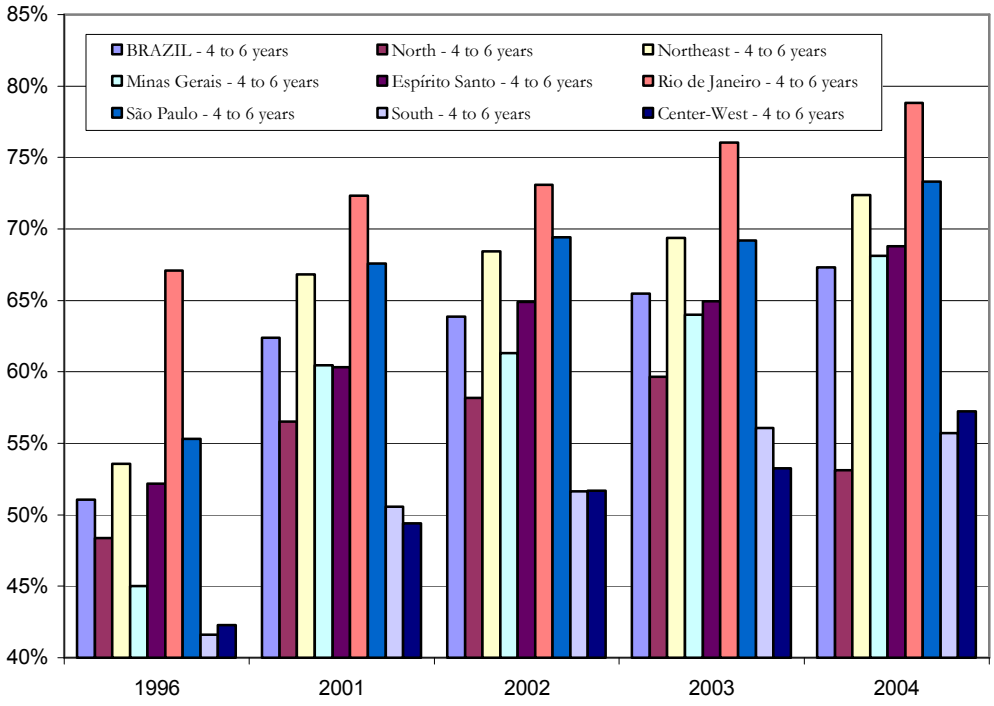


Figure 2: % Preschool Coverage Rates, Children Aged 4 to 6



The analysis on differences in coverage rates can be extended to take into account individual and family characteristics, besides geographical variables. This is done next, in terms of demand functions for daycare and preschool services. The model estimated is a logistic

representation of such a function, in which variables related to the individual and the family environment are included as control variables. The model estimates the probability of a child attend daycare (model 1) and preschool (model 2) and was estimated separately with data for 1996 and 2004 to evaluate eventual changes in the relative importance of explanatory variables with the passage of time.[38] The results, shown in Table 2, allow for following comments:

(i) Sex of the child does not matter for both daycare and preschool attendance: the coefficients are not significant in any case. If anything, a negative effect appears in 2004, although the coefficients are significant only at lower than normal levels. It means that boys are 5 to 6% less likely to be enrolled than girls in both daycare and preschool, but only in 2004.

(ii) Skin color has no effect on the likelihood of attending daycare and preschool in 1996. But in 2004 we observe that whites are 14% less likely to attend daycare than non-whites. No effect was found for preschool attendance.

(iii) Living in urban areas has a strong positive effect on both daycare and preschool attendance in 1996 and in 2004. The orders of magnitude of the coefficients are nearly the same in both dates: 0.95 and 1.03 in the case of daycare; a little less than that, or 0.76 in both dates in the case of preschool. This suggests that the coefficients are stable over time.

(iv) The coefficients that indicate the importance of regional effects show a less clear picture. Thus, living in the Center-West significantly decreases the likelihood of attending both daycare and preschool in both dates analyzed. In both cases the coefficient seems to have decreased over time: from – 0.52 to – 0.67 in the former case; from – 0.35 to – 0.66 in the latter. This implies significant negative effects relative to children living in the Southeastern region (omitted variable). The other region with negative effects relative to children who live in the Southeast is the North – except in the case of daycare in 2004, where no significant effect was found. The likelihood of attending daycare (relative to the Southeast) in the Northern region decreases from – 23% in 1996 to – 88% in 2004. The effect on preschool is significant in 2004, only. It suggests that the probability of attending preschool in the North was 49% less than in the southeast. Children who live in the Northeast have a significantly higher chance of attending preschool and daycare than in the Southeast, but only in 1996. Results for the Southern region are mixed. They show a significant decrease in the likelihood of attending preschool relative to the Southeast, the effect decreasing from – 45% to – 83% from 1996 to 2004. But there is a modest (0.2) positive effect for daycare attendance in the region in 2004.

(v) Variables related to the family environment come next. Interestingly enough, belonging to a "single parent" family increases the likelihood of attending daycare in both dates analyzed, indicating that "single mother families" (the more usual case, although there are cases of single fathers as well) tend to resort more often to daycare facilities relative to other families. This was observed both in 1996 and in 2004. The effect on preschool attendance is weaker and characterizes 2004, only.

(vi) The educational level of the mother affects positively and seemingly increasingly the likelihood of attending preschool, relative to mothers with no formal schooling – but not

[38] The only variable measured in monetary terms, per capita family income, was adjusted in 1996 to 2004 prices so as to make coefficients comparable.

in the case of daycare, at least up to a certain level of number of years of study. The estimated coefficients are positive, of the same orders of magnitude in both years analyzed and increase with years of schooling in the case of preschool, only.[39]

(vii) Families with unemployed mothers show a consistently lower likelihood of child enrollment in both daycare and preschool. This suggests that unemployed mothers take care of their small offspring more often than not. The effect has the same order of magnitude in both years, suggesting little change, and is more negative – implying smaller chances – in the case of daycare attendance.

(viii) A similar, but stronger effect is apparent in the case of families in which the mother does not participate in the labor force – i.e., is out of the Economically Active Population (EAP) – in which case taking care of children at home is more likely. Note that the coefficients are higher – i.e., more negative – in the case of daycare, indicating a lower probability in this case. But they are of the same order of magnitudes as the ones characteristic of families with unemployed mothers in the case of preschool attendance.

(ix) The effect on the number of siblings is mixed.[40] It adds 11.4 percentage points in both dates to the probability of attending daycare. But it subtracts between 0.06 and 0.08 of the probability of attending preschool. This difference between the two results is difficult to explain.

(x) The family income effect is large and significant in both dates and in both educational services analyzed. In addition, all coefficients have the same order of magnitude. They imply that a 1% increase in per capita family income increases the likelihood of attending pre-primary educational services in percentages that range from 24% to 37%. This is strong evidence of the fact that attendance of these services is regressive on income, the poor families being characterized by much lower attendance rates than the rich ones.

(xi) Finally, the intercept apparently increases with time – i.e., becomes less negative – and between daycare and preschool attendance. This suggests that the influence of the omitted variables (children who are female, non-white, live in rural areas of the Southeast, do not belong to "single parent" families, whose mother is illiterate, but employed) has increased with the passage of time, as well as the joint influence of variables non considered. It may also mean that scale effects have changed in the suggested direction. Due to the catch-all nature of this term, not much can be said.

[39] The relatively large magnitudes of the coefficients on "undeclared schooling of the mother" suggest that their educational level was high. But this is only a speculation.

[40] "Number of siblings" is our interpretation for the variable "number of children in the family". It is a simplification, of course.

Table 2: Coefficients of the Regression Equations

Dependent variable: attends daycare (ages 0– 3 years) or preschool (ages 4–6 years)				
Years	**1996**		**2004**	
	0 to 3	**4 to 6**	**0 to 3**	**4 to 6**
Male	0.018	-0.013	-0.053	-0.059
	(0.31)	(0.33)	(1.17)	(1.53)
White	-0.03	0.021	-0.143	0.057
	(0.45)	(0.48)	(2.81)**	(1.33)
Urban	0.95	0.762	1.026	0.763
	(8.96)**	(14.92)**	(11.57)**	(15.28)**
North region	-0.228	0.09	-0.875	-0.487
	(2.01)*	(1.21)	(9.82)**	(8.00)**
Northeast region	0.339	0.855	0.09	0.647
	(4.61)**	(16.12)**	(1.53)	(11.94)**
South region	0.061	-0.449	0.2	-0.825
	(0.74)	(7.71)**	(3.03)**	(13.81)**
Center-West	-0.517	-0.346	-0.671	-0.655
	(5.00)**	(5.53)**	(8.43)**	(10.56)**
"Single parent" family	0.379	0.078	0.281	0.115
	(4.78)**	(1.33)	(4.70)**	(2.11)*
Education mother = 1 to 3 years study	-0.114	0.228	-0.118	0.319
	(0.80)	(3.31)**	(0.86)	(4.16)**
Education mother = 4 years of study	-0.051	0.37	-0.141	0.323
	(0.36)	(5.16)**	(1.01)	(4.08)**
Education mother = 5 to 7 years study	0.117	0.56	-0.035	0.469
	(0.88)	(7.90)**	(0.28)	(6.29)**
Education mother = 8 years of study	0.206	0.793	0.189	0.662
	(1.41)	(9.49)**	(1.39)	(7.46)**
Education mother = 9 to 11	0.375	1.219	0.298	1.087
	(2.81)**	(14.97)**	(2.37)*	(13.34)**
Education mother = 12 to 14 years	0.613	1.591	0.576	1.569
	(3.38)**	(9.55)**	(3.49)**	(9.41)**
Education mother = 15 or more years	0.933	1.78	0.683	1.954
	(5.55)**	(11.35)**	(4.36)**	(10.50)**
Education mother = undeclared	0.938	1.10	1.037	1.274
	(2.17)*	(3.60)**	(4.58)**	(5.65)**
Unemployed mother	-0.572	-0.225	-0.366	-0.22
	(3.90)**	(2.29)*	(4.29)**	(2.86)**
Mother out of EAP	-0.896	-0.187	-1.003	-0.267
	(12.47)**	(4.52)**	(18.17)**	(6.30)**
Number of sibblings	0.114	-0.076	0.114	-0.058
	(3.81)**	(3.86)**	(4.50)**	(2.92)**
Log of per capita family income	0.374	0.322	0.269	0.235
	(9.95)**	(12.36)**	(8.07)**	(8.87)**
Intercept	-5.262	-2.439	-4.0	-1.331
	(22.03)**	(16.41)**	(17.08)**	(8.09)**
Number of observations	22222	15947	22630	17832
Pseudo R squared	0.1034	0.1227	0.1046	0.1118
Robust z statistics in parentheses	* significant at 5%; ** significant at 1%			

5. LESSONS FROM THE INTERNATIONAL AND LATIN AMERICAN EXPERIENCES AND RESULTS FROM RESEARCH ON BRAZIL

"It is possible to partially compensate for exposure to adverse environments if high-quality interventions are made sufficiently early in children's lives. The remediation efforts that appear to be most effective are those that supplement family resources for young children from disadvantaged environments". (CHLM, p.3)

"An economic case for government intervention in ECE can be made on the grounds of equity" (Currie, 2001, p. 215) " A second broad justification … is …market failure… including liquidity constraints, information failures and externalities" (*Ibid*, p. 216)

There is little evidence of results from ECD interventions and their impacts over time in Brazil, the main focus of this note, except for those on two informal programs and the World Bank (2001) study.[41] The experiment reported in this last work will be briefly summarized at the end of the section, for its importance and pioneering role, after we survey evidence from the OECD, the USA, Latin American countries and two informal programs in Brazil: PROAPE and *Criança Maravilhosa*.

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OECD launched in 1998 a thematic review that covered a number of issues and was, on the whole, basically policy-oriented. It is an evaluation of present national efforts aiming at ECE and care in 12 countries: Australia, Belgium, the Czech Republic, Denmark, Finland, Italy, the Netherlands, Norway, Portugal, Sweden, the United Kingdom and the United States. (OECD, 2001)

The OECD study notes that in many countries education and care of young children is shifting from the private to the public domain, with attention being given to the complementary roles of families and ECE institutions. On the main policy developments and issues, attention is drawn to a set of interrelated aspects such as: (a) expanding provision towards universal access;[42] (b) raising the quality of provision; (c) promoting coherence and coordination of policy and services; (d) exploring strategies to ensure adequate investment in the system;[43] (e) improving staff training and work conditions; (f) developing appropriate pedagogical frameworks for young children; (g) engaging parents, families and communities. We next concentrate on items (b) and (e). Two key policy concerns are quality and access.

The quality issue is a pervasive theme in all countries concerned. Although definitions of quality differ across countries, national quality guidelines are deemed necessary. Many common (to the several countries analyzed) definitional elements exist, especially for children from the age of 3 (staff-child ratios, group sizes, facility conditions, staff training).To evaluate quality some countries use standardized observation scales and child assessment measures. Others prefer the use of cooperation to construct the programs objectives at the local level, engaging stakeholders in the process. Responsibility for quality assurance is frequently shared by external inspectors, pedagogical advisors, staff and parents (and, occasionally, children).

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[41] The results are also partially reproduced in Paes de Barros and Mendonça (2006).

[42] The authors note that the age at which children make the transition to formal primary education varies substantially among countries, from 4 to 7. This influences the duration and nature of ECE and care experiences.

[43] In almost all countries reviewed governments pay the largest share of costs, with parents covering 25 to 30%. The two or three years of ECE and care prior to mandatory schooling are often free. Direct provision through services and schools makes up the majority of government assistance in most countries.

Overall, there is an across countries trend towards externally-validated self-evaluation. Among the weak points the study notes: lack of coherence and coordination of policy and provision; low status and training of staff in the social welfare sector; lower standards of provision for children under the age of 3; a tendency for children from poor families to receive inferior services.[44] The ways governments promote quality improvements are: framework documents; voluntary standards and accreditation; dissemination of research and information; judicious use of special funding; technical support to local management; raising the training and status of staff; encouraging self-evaluation; and establishing a system of checks and balances that includes parents as agents.

Countries have adopted two main approaches to staffing: (a) a regime in which a group of teachers works with children over 3 and another, of lower-trained workers, dedicates itself to other services; (b) a system in which a pedagogue works with children from birth to 6. There is a cross-national trend towards requiring at least 3 year tertiary degree for staff for preschool children. There are gaps in the areas of work with parents, infants and toddlers, special education and research and evaluation. Other characteristics are: low pay, status, poor working conditions, limited access to in-service training and limited career mobility.

The report identifies eight key, but very general policy issues to improve equitable access to quality ECE and care. Among them we highlight the following somewhat obvious ones: universal approach to access, substantial public investment in services and infrastructure, appropriate training and working conditions for staff, systematic attention to monitoring and data collection.

ECE programs in the USA have been reviewed by many analysts. Two of the best known analytical pieces in more recent years are Currie's (2001) survey and CHLM's (2005) comprehensive study. In the former, J. Currie surveyed center-based ECE programs in the USA, particularly those that emphasize school readiness as a goal.[45] The latter work presented a thorough analytical review of many ECD programs in the USA. To shorten the length of this note while at the same time aiming at profiting the most from the richness of CHLM's work, we chose to put together selected excerpts of their evaluation of three USA programs in an Annex, instead of attempting to summarize in this section of the text the rich evidence they present. Thus, we begin the description of programs in the USA by Currie's (2001) study.

Currie (2001) begins by reviewing Head Start, a program started in 1965 that presently (at the time of her survey) served 800,000 children in part time programs. This represents almost 50% of eligible 3 and 4 year-old poor children, at a cost of US$ 4.7 billion in 1999.[46]

[44] The reader may have noted that the same concerns apply to the Brazilian system.

[45] Currie also mentions a report from the National Research Council (dated 2000) that divides skill development in three areas: cognitive skills, school readiness, and social and emotional development, the literature usually focusing on the development of cognitive skills, especially on IQ. Although recognizing that "IQ is certainly not a perfect predictor of adult outcomes, it is positively correlated with success in many areas" (p. 214). Gains in measured IQ tests associated with early intervention are often short-lived. Attention has then changed to school readiness.

[46] Which represents almost US$ 6,000/child/year; but Currie notes that in 1998 it cost US$ 5,021 to keep a child in part-day Head Start program for 34 weeks a year. "The part-day Perry Preschool intervention cost US$ 12,884 per child for a program that lasted eight months a year over two years. Since 20% of the children participated only for one year, the figures imply that the cost per child was approximately US$ 7,000 per year " (Currie, ibid, p. 221).

The review of Currie's evidence, based on the literally "dozens of studies of Head Start and closely related preschool and early school enrichment programs" (Currie, *op. cit.*, p. 213) points to the conclusion that "these programs have significant short- and medium-term benefits, and that the effects are often greater for more disadvantaged children (p. 213).

She continues: "The jury is still out on Head Start, but a simple cost-benefit analysis suggests that Head Start would pay for itself ion terms of cost-savings to the government if it produced even a quarter of the long-term gains of model programs" (p. 214).

Many studies of ECE do not report costs and benefits, as noted by Currie. One exception is the Perry Preschool Project, but the existing evaluations are open to debate.[47] Currie also shows her back-of-the envelope calculations relative to the Head Start program to conclude (Table 3 in her paper) that the "... available evidence suggests that the short- and medium-term benefits could easily offset 40 to 60 percent of the cost of large-scale, publicly funded early intervention programs such as Head Start. Thus, even relatively small long-term benefits of such a program may be sufficient to offset the costs of public investment" (Currie, *op. cit*, p. 234)

Among the programs for developing countries, the World Bank (2001) reports on a mother training program in Turkey: the Turkish Early Enrichment Project. This is a project targeted at "mothers in semi-urban, low-income, squatter housing areas. All mothers in the project had similar socioeconomic and demographic characteristics, including low levels of education, low income, and rural origin". The intervention consisted of training given to a randomly selected group of mothers for 2 years (30 weeks each year) and a control group. Mother training consisted two programs: cognitive training and mother enrichment (World Bank, 2001, p. 43).

Assessments of the children and their families were conducted in four main areas: cognitive development, socio-emotional development, family context, and day-care context. Mothers and children were evaluated 4 and 7 years after the intervention. As to the outcomes, compared with a control group, it was found out: for children, that they had significantly higher scores on all tests of cognitive development; had significantly better school performance (general ability, mathematics, and Turkish) over 5 years of primary school; were rated as less aggressive, less dependent, and having a higher self-concept; significantly lower school dropout rates (14 percent versus 33 percent for the controls) at the 7-year follow-up. The outcomes for mothers were significantly improved mother-child interactions.[48]

An interesting case, but only remotely related to ECD, presents itself in the case of extreme deprivation and its effects on children school attainment and economic performance in adult life. Excerpts from CHLM (2005) dealing with two cases of these particular, unfortunate experiments were put together in the BOX presented next to illustrate the issue, whose relevance to extremely poor areas is self-evident.

[47] See the Annex for excerpts from CHLM (2005) that deal with the Perry Project, besides other programs.
[48] For example, trained mothers were more attentive to their children, reported reading or telling stories to their children more, and had higher expectations for their children, especially regarding their success in school.

BOX 1: Extreme Deprivation and Remediation

(From Cunha, Heckman, Lochner and Masterov, 2005, p.53-54)

Institutional rearing of children, insofar as it tends to be exceptionally poor, provides scientists with a unique natural experiment that can be used to ascertain the effects of severe environmental deprivation. Evidence on children from such environments allows us to answer questions about the developmental consequences of negative early experience and how amenable exposed children are to interventions such as foster care. It may also enable us to learn if there are critical or sensitive periods for development, which would have important implications for the relationship between the timing of an intervention and the extent of its success….

The Ceausescu regime in Romania (1966 to 1989) attempted to enlarge the country's workforce by increasing the birth rate. Virtually all types of abortion were criminalized, and divorce was made much more difficult.[49] (But) increasing economic hardship coupled with Ceausescu's goal of paying off all international debt by imposing rationing, obliged many women to work outside their home. Since childcare for the young (or any other alternative) was scarce, many children were simply abandoned. Institutionalization of children was not stigmatized, and was even encouraged officially.

When the regime fell, there were roughly 170,000 children in 700 overcrowded state institutions. While no rigorous statistics on the conditions in these homes are available, foreign visitors described the situation as appalling. Children remained in their cots all day, with no toys or other types of stimulation. Care-giving and personalized affection were all but nonexistent. Many young children were fed only gruel from bottles that were propped up, and some continued to have difficulty even chewing solid food some years later. Orphanages were frequently located in remote areas of the country; some children were transferred far away from where they were born and were "lost" in the system. By the late 1980s, many institutions had no hot water, no constant heat during winter, no diapers or even detergent. Medical supplies, including antibiotics and syringe needles, were extremely scarce. Children were often tied down or locked in rooms to keep them under control and some were abused. While the prevalence and incidence of these problems are unknown, most children exhibited a range of emotional, behavioral and medical problems when they were adopted abroad.

Several studies have been conducted to evaluate the effects of interventions at various ages on these children. The largest study of this sort was completed in the UK by Michael Rutter, his colleagues and the English and Romanian Adoptees Study Team… This group studied 165 children who were adopted from Romania into UK families between 1990 and 1992 and compared them at ages 4 and 6 to 52 adopted children from within the UK who were all placed before age 6 months. … at the time of adoption, the orphans showed substantial developmental retardation, malnutrition, and a range of health problems. Relative to ordinary English children, half of the Romanian orphans were below the third percentile on weight, and over a third was below the third percentile on height. The overall mean score on the Denver developmental quotient was 63, indicating mild retardation.

The same pattern appears to hold for cognitive development at ages 4 and 6, as measured using the McCarthy General Cognitive Index. Romanian orphans who were adopted into UK families from an environment of severe early deprivation exhibited remarkable improvement. This recovery was characterized by a negative linear dose-response relationship with the duration (or perhaps severity) of the exposure to poor pre and postnatal environments. The children who caught up to ordinary UK adoptees were the ones who were adopted before 6 months of age. This shows the importance of early vs. late intervention…. This evidence is also consistent with the notion that early environments are a sensitive, rather than a critical period of development for many child outcomes. Had the interventions occurred later in the life of the children, it is likely that they would have been less effective.

[49] In addition to that: contraceptives were neither manufactured domestically nor imported; progressive income taxes on childless adults over 25 were imposed; monthly cash subsidies were awarded to families with children; and the average allowance per child rose as family size increased; various labor laws eased working conditions for pregnant and nursing mothers by eliminating overtime and night work entirely, and by reducing physically demanding work; over three months of paid maternity leave was available, as were additional breaks or reductions in work hours of up to two hours per day; early retirement was available for women as a function of the number of children they raised to age 10.

ECD outcomes in Latin America and the Caribbean have been discussed by Schady (2005).[50] He notes that despite the "wealth of data in the medical, sociological and economic literature on the health and nutritional status of infants and young children in LA, relatively, little is known about other dimensions of their welfare" (Schady, *op. cit.*, p. 9).

The Mexican case is presented first, and relies on evidence from three studies: (i) the first focus on the relationship between deficits in child weight and height and the Mental Development Index of the Bayley scales only to find no association between height for age and the Bayley score once family and environmental variables are included" and, more important, "none of the family or socioeconomic factors (included) … are significant predictors of Bayley scores" (p. 10); (ii) the second study evaluates the impact of a conditional cash transfer program (*Oportunidades*) on a set of ECD outcomes, the conditionality being regular household monitored visits to health centers. It was found out that groups of children affected by the program displayed significant differences in motor skills, had fewer emotional problems (but only for girls). Further, the duration of program exposure has no significant on any outcome, be they motor skills, socio-emotional problems or cognitive development; (iii) the third study focus on schooling outcomes and found out that children that "who were exposed to *Oportunidades* between ages 0 and 6 were likely to subsequently enter school at a slightly earlier age, were more likely to progress on time and more likely to have higher years of completed schooling as they begin to enter school". (p. 12)

The case of Ecuador is evaluated next, based on a sample of poor children in order to study the determinants of child cognitive development.. It was found out that "children from healthier households, and children whose parents are more educated, have significantly higher test scores". (p. 13)

The analysis on the Bolivian experiment uses non-experimental data to evaluate the impact of the preschool *Proyecto Integral de Desarrollo Infantil* (PIDI), a program that provides daycare, nutritional and educational services to children aged 6 to 72 months in "full time child care centers in the homes of women living in low-income areas targeted by the program" (p. 15). It was found out, after dividing children in two groups, treated and non-treated, that there is "some evidence of positive program impacts on motor skills …, on psychological skills, and on language acquisition…. Impacts seem to be concentrated among children ages 37 months or older.. (disaggregating) by the length of exposure, (the) effects are most clearly observed among children who have been exposed to the PIDI program for more than a year" (p. 15). Cost-benefits ratios have also been estimated (the cost of the program is US$ 43 per month) and the authors, according to Schady (2005) "heroically combine estimated program impacts with data on Bolivia and a number of other countries to argue that there are positive cost-benefit ratios to PIDI under a variety of plausible assumptions and discount rates". (*Ibid*, p. 15)

In Jamaica a number of papers analyzed ECD deficits and the short- and medium-term impacts of interventions, the results of which suggest that stimulation and nutritional supplement interventions has positive impacts on child development (Schady, 2005, p. 16). But

[50] Schady also reviewed evidence on programs in the US such as the Perry School, Carolina Abecedarian, Early Training, and Head Start. He also discusses the evidence on programs that attempt to affect parenting behavior in the US based on review papers by other authors.

a study casts some doubt on the existence of long-term nutritional interventions. The cognitive development of poor children was improved significantly among those who participated in an ECD intervention delivered directly in the family's home by trained community health workers. The intervention consisted of weekly to monthly psychosocial stimulation for an hour with or without food supplementation (World Bank, 2001, p.40).

In Chile, in addition to sponsoring regular preschool classrooms in formal education centers, the Ministry of Education supports several unconventional community-based programs, among them the *Programa Conozca a su Hijo* (Get to Know Your Child). This is a community-based model that promotes ECE. Services vary according to the age of the children, the geographic location, and the characteristics of the service provider. *Conozca a su Hijo* is an educational intervention initially designed to target poor mothers and children living in geographically dispersed rural areas. (*Ibid*, p.41-42)

The program provides an effective alternative to formal early childhood services in rural areas where no other programs exist and prepares children for primary school education. Further, it improves their probability of success in the future. The program is carried out with the assistance of trained female community leaders, who educate mothers, particularly those whose children do not have access to regular preschool services.[51] Between 1994 and 1998, the Ministry of Education conducted studies to evaluate the major providers of formal and non-formal early childhood services in Chile. The program "Get to Know Your Child" was one of the programs evaluated using a controlled experimental research design. Some major findings were:[52] (a) to children: (i) better cognitive development scores; (ii) more often engaged in activities to help develop fine motor skills; (iii) had better language development and coordination; (iv) had better mathematics, reading, and writing scores in the first grade. (b) to mothers: (i) had better attitude, knowledge, and practices regarding childrearing, cognitive stimulation of children, and future education expectations for their children. They also recognized the importance of play activities for the cognitive development of their children; (ii) demonstrated higher self-esteem and better problem-solving skills. (*Ibid*, p.42)

A study by Berlinski and Galiani (2005) on Argentina analyzed the impact of a large program to construct preschool facilities in the 1990s[53] on pre-primary school attendance and maternal labor supply. They concluded that "the program had a large, positive impact on preschool enrollment". (p. 17)

Berlinsky, Galiani and Gertler (2006) revisited the Argentinean case in a more recent paper. They begin by emphasizing that although the theoretical case for universal pre-primary education is strong, the empirical foundation is weak. Their contribution investigates the "effect of a large expansion of universal pre-primary education on subsequent primary school performance in Argentina" to find out that "one year of preprimary school increases average third grade test scores by 8 percent of a mean or by 23% of the standard deviation of the distribution of test scores. We also find that preprimary school attendance positively affects

[51] The program uses available spaces in schools or other community places where mothers can meet at least once a week.

[52] Benefits to children and mothers are for those participating in the program, compared with a control group.

[53] This was a large infrastructure program aimed at increasing school attendance for children between the ages of 3 to 5. Between 1993 and 1999, Argentina constructed enough classrooms for approximately 175,000 additional children to attend preschool.

student's self-control in the third grade as measured by behaviors such as attention, effort, class participation, and discipline" (Taken from the Abstract).

Turning next, and finally, to the Brazilian experiments, we divided the remainder of the presentation in two parts: first we report on two informal programs; next we highlight results from the World Bank 2001 study more related to ECE.[54]

A note on two non-formal programs: excerpts from the World Bank 2001 document

The first program is the World Bank-supported *Programa de Alimentação de Pré-escolar* — PROAPE, based on the Centers for Education and Feeding of Preschool Children (CEAPES), an ECD experiment conducted in Sao Paulo.[55] (World Bank, *op. cit.*, p 36)

PROAPE was informal, in the sense that most staff had no certified training and none was part of a formal pay system. The program used existing administrative and physical facilities in public primary schools and high schools, depended heavily on community and parental participation, and taught the children using toys and educational materials made by parents and teachers. Three different schedules were tested: model A (daily sessions, 220 days per year), model B (sessions every other day, 130 days per year), and model C (sessions during school vacation only, 60 days per year). On weekday mornings, groups of children ages 4-6 were assembled for supervised learning and physical activities, basic health care, and a snack. One trained staff member ran the groups and was assisted, on a rotating basis, by five or six community members (usually mothers or other family members).

A 1981 evaluation conducted by the *Instituto Nacional de Alimentação e Nutrição* (INAN) concluded that PROAPE participants benefited significantly from the program. 74% of children in the program graduated from second grade, compared with 58% of a control group drawn from the same area and sharing the same background, but with no preschool experience. These pilots proved so successful that, by 1983, the MEC had taken over funding for the program and expanded it to serve 876,000 children in 27 states and territories.

Another evaluation compared PROAPE's results in Alagoas with results achieved by other preschool alternatives. In the former program, children ages 4-6 were brought together and PROAPE provided three trained paraprofessionals[56] for every 100 children, and parents assisted the paid staff. PROAPE provided a snack, training, educational materials, supplementary food, dental treatment, vaccinations, vitamin supplements, and eye exams. Results from the 78-day program were compared with those achieved after 2 years of formal kindergarten, 180 days of *Casulo* (a different alternative preschool program), and no exposure to preschool. At the end of a year, 76% of *Casulo* and 73% of PROAPE children passed first grade. In contrast, first-grade pass rates were 62% for children with formal kindergarten and 53% for those without preschool. (World Bank, *ibid*, p. 37)

[54] The source of data and analysis in this evaluation is IPEA (1999), a work by R. Paaes de Barros and R. Mendonça.

[55] The pilot phase of PROAPE (1977 to 1980) tested different models of large-scale, low-cost integrated service programs. All of the programs tested included health, nutrition, and education interventions. The initial study sample included 4,800 children ages 4 to 6 in the state of Pernambuco.

[56] Who were paid 70% of a minimum salary to work for 3 hours per day.

The second initiative referred to above is the *Criança Maravilhosa* program in the city of Rio de Janeiro where about 75,000 children of the total population (most of them poor) are served by some type of municipal childcare program.[57] It was created to respond to the needs of poor families and to improve the quality of life, social and cognitive development, and life chances of low-income children ages 0-6. The program hopes to improve the quality of care that poor children receive, while expanding coverage of this group to 200,000.[58] A follow-up system will enable the children's progress to be monitored up to their entry into primary school. A special fund will offer financing on a competitive basis for projects submitted by organizations in the civil society, and funding will also be provided for innovative government projects.

The municipality will award grants for community projects through a demand driven system that will promote, accept, evaluate, fund, and monitor the projects. The projects will undertake activities that respond to the target groups and kinds of activities that the municipality has defined for the program. Emphasis on quality of service and having an effective system for monitoring and evaluation supports implementation of a management information system and research to evaluate the impact of the program. Activities will be conducted by the four government departments directly involved in the program. Local committees will be linked to regional coordinating boards representing the departments. (World Bank, *ibid*, p. 35)

The measurement of benefits and costs of preschool education (from World Bank, 2001)

Data from the Brazilian Living Standards Measurement Survey (PPV) conducted by IBGE in 1996/97 was ingeniously used to evaluate the impact of preschool education on children's nutrition, years of schooling, and future earning capacity. Next we comment on the main findings of the impact of preschool education on children's (i) education outcomes, (ii) employment potential and future earnings, and (iii) nutritional status. The summary is followed by a discussion of quantifiable benefits and costs, returns to investment, and willingness to pay for early education.

Retrospective data were used for the cohort between the ages of 25 and 64. The current outcomes of this cohort are explained in terms of the preschool education received by the cohort in the past. To evaluate the impact of early education, the study assessed the internal rate of return of preschool education on service expenditures.[59]

[57] These programs, however, typically offer discrete services that are not linked to other programs in an integrated approach to support the needs of children and families.

[58] The program was developed by the Secretariats of Social Protection, Health, Education, and Labor in Rio de Janeiro, in partnership with the World Bank. Start-up activities are being funded by the BNDES and the Bernard van Leer Foundation. (World Bank, 2001, p. 35) Note that all information on *Criança Maravilhosa* here provided is presumably based on figures for 1999.

[59] The analysis was carried out according to the following steps: First, the benefits of preschool education were estimated in terms of children's future performance in school and in the labor market (earning capacity), and in terms of their nutritional status. Only benefits that can be "monetized" were selected, to ground the study and enable comparisons with costs. Second, the cost of educating a child in preschool was estimated. Third, the internal rate of return and the willingness to pay for preschool education was calculated by comparing the costs and benefits of providing the services.

It was found out that investment in preschool has a strong impact on additional schooling gained. Two years of preschool attendance could help to increase Brazil's average schooling level from the current 6 years to about 7 years. Another notable impact is the indirect effect on future earning capacity, which is estimated to increase by 11%, based on attending 2 years of preschool.

With respect to the impact of preschool on employment and future earnings, the research's marginally significant result was for men's earnings — 1 year of attendance results in a 2-6% increase in earnings — the effect on women's income not being significant.

There is, therefore, a direct positive impact of preschool on income and an indirect impact through increased overall educational achievement. One year of primary school, in general, is estimated to raise income by about 11 percent. (*Ibid*, p.12)

By combining the findings on the impact of early intervention on educational attainment with income gains associated with education, the study was able to estimate the impact of ECS on future productivity. For children whose parents have 4 years of schooling, 1 year of preschool is associated with 0.45 additional years of education. Because it is estimated that 1 additional year of education increases potential earnings by 11%, 0.4 years more of education produce an indirect gain of 5% in earning power. Children who attend preschool have a direct gain of 2% in potential earnings (using the lowest estimate provided in the study). The combined indirect and direct gains amount to a 7% increase in potential lifetime income. (*Ibid*, p. 13)

Also, there is some indication that the increase in earning capacity may be larger for children from families in which parents have the least schooling. Among this group, 1 year of preschool is associated with an additional 0.6 years of education and a 6% increase in earning capacity for children whose parents are illiterate.

The impact on children's nutritional status was measured in three different ways: by weight for age, height for age, and weight for height.[60] The effect of preschool attendance on nutritional status is then estimated by running logistical regressions and determining whether attendance at preschool influences a child's ability to reach an acceptable critical level of nutrition and health, compared with children who do not attend preschool. Other determinants of nutritional status were controlled to isolate the impact of preschool. Of the three indicators used to measure nutritional status, preschool attendance has a significant positive impact only on height for age and weight for height. The effect of preschool education on weight for age and the effect of time spent in preschool are not significant. School lunches also do not have a strong impact on children's nutritional status. Three of the control variables important in explaining better nutrition outcomes were mother's education, children who lived in the Southeast region, and female children. There was no evidence that poorer children (identified by the group in which parents had less education) would gain more in terms of nutritional benefits by attending preschool compared with children of better-off parents (those with more schooling). Therefore, even though pre-schooling appears to be positively correlated with some attributes of nutrition, some results are inconclusive — such as the

[60] Statistically significant deviations from standardized values of each of these measures are associated, respectively, with acute malnutrition, seriously stunted growth, and total malnutrition.

insignificant impact of school lunches on nutrition and the lack of significant benefit for children from poor households. (*Ibid*, p. 14)

The cost-benefit analysis of preschool in Brazil includes only those benefits for which the impact can be measured in monetary terms and compared directly with costs.[61] The objective is to be able to translate the benefits of preschool education into a child's expected future income. For this purpose, three types of preschool benefits are selected: the impact on schooling ultimately attained, the impact on repetition, and the direct impact of preschool education on income level.

An additional year of preschool can raise income level directly through preschool and indirectly through the induced increase in further schooling. Staying longer in school also lowers future expected earnings due to postponed entry into the labor market. Reduced repetition, on the other hand, can raise income levels by earlier entry into the labor market. All these effects are taken into account in measuring benefits. Only men's earnings are included, because preschool education was not seen to significantly affect women's earnings — something which the study attributes to the informal nature of women's participation in the labor force.

The total social cost of an additional year of preschool was estimated at R$480.[62] The estimated cost of 1 year in primary school is R$600. Educational costs will be reduced by a decline in repetition, but will increase because of the increase in schooling from the additional year of preschool education.

The internal rate of return is the discount rate at which the present value of investment costs of preschool education equals the present value of the benefits of preschool education. The cost-benefit analysis resulted in a rate of return on preschool education of between 12.5 and 15%. The rate of return is 1.5 percent higher for the Southeast region and tends to be higher among whites. (World Bank, 2001, p. 15)

The calculation of the present value of the income derived from 1 year of attending preschool can be compared with the income derived without preschool attendance. This difference indicates whether investing in preschool education is worthwhile for society. Based on a discount rate of 10 percent, the willingness to pay for 1 year of preschool is between R$900 and R$1600. The higher amounts are for children living in the Southeast region and whose fathers have more schooling. Since the cost of 1 year of preschool was estimated at R$480, the willingness to pay is demonstrated to be much higher than the cost. This indicates the feasibility of introducing fees, especially for better-off parents.

The results of the cost-benefit analysis suggest that early intervention in the schooling of 4-6 year olds can make a difference by improving the chances of attaining higher levels of

[61] If education is seen to be an important investment in human capital, the higher productivity of the person receiving the education is reflected in higher earnings in the labor market.

[62] To arrive at unit costs of preschool education, the total public spending of R$1.9 billion (1995) on children ages 0-6 is combined with the estimated 4.4 million children in preschool in 1995. Data on spending for preschool and day care, separately, were not available. The annual public cost of providing preschool education is estimated to be R$445 per child. The private cost is calculated by including all the costs to parents (e.g., uniforms, books, transportation) and is calculated to be R$35.

education, reducing repetition, and earning a higher income in the future. The main impact of preschool seems to be one of better preparedness for further schooling. Therefore, investment in good-quality preschool is expected to improve the attainment and the efficiency levels of future schooling.

Returns to investing in preschool education are estimated at 12-15 percent. Although direct health-related outcomes are weak, there will be some improvement in health and nutrition indirectly through the impact of additional time gained in overall schooling through preschool attendance. Since public preschools in Brazil are accessible to both rich and poor, the willingness-to-pay calculation is especially useful. The benefits of preschool education are seen to substantially outweigh the costs, which suggests that the charging of fees for those who can afford them is feasible (especially for parents living in the Southeast. where the returns to education are calculated to be slightly higher). Preschool could be subsidized or provided free to poor families which currently do not have access to these services. (*Ibid*, p. 16)

Concluding remarks

The Brazilian Ministry of Education (MEC) is increasingly aware of the need to improve ECD and especially pre-primary education, as witnessed by recent legislation enacted. Despite increasing acceptance of the fact that pre-primary education — and, especially, daycare services[63] — are an important factor in improving ECD outcomes in the future, there is still no wide acceptance of this aspect in many family and community circles. This is precisely the case, for instance, of family perceptions on pre-primary education that was unveiled from results disclosed on recent research[64] in Brazil.

The research was carried out in four states (Minas Gerais, Rio Grande do Sul, Pernambuco and Ceará) and shows that both daycare and preschool are still undervalued in the country. Most respondents still cast doubt on the importance of pre-primary education, believing that it is more important for the children to stay close to their mothers — a typical middle and upper class belief.

1,136 people were interviewed, among them 254 children aged 5 years. Among other interesting aspects, the results show that only 27% of the professors had university diplomas (Brazil's total, according to the MEC, is almost 38%). Adding incomplete university the total jumps to 51.2%. Almost 40% of the parents interviewed answered that their children aged 0 to 6 years did not yet attend daycare and preschool because they don't think it important or they believe the children are too young. The issue seems to be related to the fact that supply of daycare, especially, falls far short from demand — 24.4% of the mothers interviewed could not enroll their children in daycare centers. According to the authors, citing Brazil's MEC, the country had nearly 11 million children aged 0 to 3 years, of which 1.4 million attend daycare. Among the other reasons it was found out that: 19.6% believe that children under 6 years are too young; 18.3% think pre-primary education is not important, or there is no need to enroll the children in centers for children; 4.1% believe that the schools don't take good care of the children.

[63] As pointed out in some works in the research surveyed in Schady (2005).
[64] Information from the newspaper *O Estado de São Paulo*, June 5, 2006, p. A15. The research, called "*Consulta sobre Qualidade da Educação Infantil*", was led by Prof. Maria Malta Campos (PUC/SP).

This suggests that, despite the increasing importance attributed to ECD, and ECE in particular there is still a long way to go before these preschool services be understood as fundamental to improving children's adequate learning at school level. The range of benefits has been shown to be large, and go from enhancing present and future health conditions, ability to learn and to perform better in adult life. Even so, perceptions in many circles still favor the belief that it is important for the children to stay close to their mothers. Indeed, the available evidence is strongly suggestive of the fact that mothers have a strong influence on their offspring's education and welfare. But the evidence also suggests that this can be complemented and enhanced by good-quality ECD.

ANNEX — From the evaluation of Early Childhood Interventions in Cunha, Heckman, Lochner and Masterov's (2005, p. 44 to 56), selected and edited.

This annex contains the description and evaluation of three programs in the USA, all of which targeted at high-risk children from disadvantaged families, followed by extracts from CHLM's conclusions[65]. The first program is the High/Scope Perry Preschool, a half-day program on a small scale in the Ypsilanti, MI public schools[66]. The second is the Abecedarian program[67]. The third is the Chicago Child-Parent Centers (CPC)[68]. All three programs had some sort of parental involvement component. They differ by duration, child age at entry and intensity. The comparison made in all of these studies is between children with enriched preschool environments and children with ordinary early environments, some of whom may attend preschool and kindergarten, albeit of a less intense variety.

(i) The Perry Preschool Experiment

The Perry preschool experiment was an intensive program administered to 65 randomly selected black children who were enrolled between 1962 and 1967. A control group of roughly the same size provided researchers with an appropriate benchmark. The experimental group assignment was performed in the following way. Candidate families were identified from a census of the families of the students attending the Perry school at the date of operation of the program, neighborhood group referrals and door-to-door canvassing. Poor children who scored between 75 and 85 on the standard Stanford-Binet IQ test were randomly divided into two undesignated groups. The children were then transferred across groups to equalize the socioeconomic status, cognitive ability (as measured by the IQ test) and gender composition of the samples. Finally, a coin was tossed to determine which group received the treatment and which did not. Children entered the Perry School in five waves, starting with wave zero (of four-year-olds) and wave one (of three-year-olds). Waves two, three and four (of three-year-olds) entered in each subsequent year. The average age at entry was 42.3 months. With the exception of wave zero, treatment children spent two years attending the program. In the final year of the program, 11 three-year-olds who were not included in the data attended the program with the 12 4-year-olds who were. About half of the children were living with two parents. The average mother was 29 years old and completed 9.4 years of school.

The treatment consisted of a 21 daily 2-hour classroom sessions on weekday mornings and a weekly ninety-minute home visit by the teacher on weekday afternoons to involve the mother in the child's educational process. The length of each preschool year was 30 weeks.

[65] Among the other important ECD programs in the USA we cite the Head Start, created in 1965 as part of L. Johnson's "War on Poverty". It was designed to improve the skills of disadvantaged children by providing them with preschool programs. (See evaluation in Currie, 2001) All three programs mentioned were also reviewed by Schady (2005), the original source of information being Currie (2001).

[66] In this program children were enrolled at age 4 and stayed until age 6. It was an experiment with a small sample size of 123 and follow-up to age 40.

[67] This is a full-day, year-round educational child care program in Chapel Hill, NC, in which children entered at the age of 4 months and continued until age 8. It was evaluated by randomization and has 111 participants. Students are followed to age 21, and samples are still being collected.

[68] This is a half-day program on a large scale in the Chicago public schools. It was a full-time program. It was evaluated by a non-experimental method (matching) and has a sample of about 1,500 children.

Ten female teachers filled the four teaching positions over the course of the study, resulting in an average child-teacher ratio of 5.7 for the duration of the program.

Some aspects of the assignment were clearly non-random and this has led some to call the Perry results into question. First, younger children were assigned to the same group as their older siblings. Two, treatment children were transferred to the control group because their mothers were not able to participate in any classes or home visits because they were employed far from home. Three, treatment children left the program before completing the second year of preschool when their families relocated, and one control child died. Thus, the final sample consisted of 123 children, which came from 100 families. In the control group, 41 families contributed 1 child each, and 12 families contributed 2 children each. In the treatment group, 39 families contributed 1 child apiece, 6 families contributed 2 children apiece, 1 family contributed 3 and another 4 children. Assigning younger siblings to the same group effectively made the family, rather than the individual, the unit of analysis. Still, it is difficult to argue that assigning siblings at random would have been a better strategy. So-called spillovers to the control siblings from home visits would have been one possible source of bias since mothers cannot be expected to treat siblings in accordance with their experimental status. Another potential source of bias is spillover from one sibling to another. In any case, differences in background between the two experimental groups are virtually nonexistent, with the exception of much higher rates of maternal employment at program entry in the treatment group.

(ii) The Abecedarian Project

This project recruited 111 children born between 1972 and 1977 whose 109 families scored high on the High Risk Index. It enrolled families and intervened on children beginning a few months after birth. Enrollment was based on the characteristics of the families more than on the characteristics of the children, as in the Perry program. Virtually all of the children were black, their parents had low levels of education, income, cognitive ability and high levels of pathological behavior. The children were screened for mental retardation. 76% of the children lived in a single parent or multigenerational household. The average mother in this group was less than 20 years old, completed 10 years of schooling and had an IQ of 85. There were 4 cohorts of about 28 students each. By the time they were 6 weeks old, the children were assigned randomly to either a preschool intervention or a control group. The mean age of entry was 4.4 months. At age 5, just as they were about to enter kindergarten, all of the children were reassigned to either a school age intervention through age 8 or to a control group. This yielded 4 groups: children who experienced no intervention at all, those who experienced an intervention when they were young, those who experienced it when they were older, and finally those who enjoyed a high-quality intervention throughout their whole childhood. The children were followed up until age 21.

The Abecedarian intervention was more intensive than Perry's. The preschool program was a year-round, full-day intervention. The initial infant-to-teacher ratio was 3:1, though it grew to a child-to-teacher ratio of 6:1 as the kids progressed through the program. Infants in the control group received an iron-fortified formula for 15 months and diapers as needed to create an incentive for participation. Many of the control children were enrolled in preschool and/or kindergarten.

During the first 3 primary school years, a home-school teacher would meet with the parents and help them in providing supplemental educational activities at home. The teacher provided an individually-tailored curriculum for each child. The target set for the parents was at least 15 minutes per day of supplementary activities. This home-school teacher also served as a liaison between the ordinary teachers and the family, and she would interact with the parents and the teachers about every two weeks. She would also help the family deal with other issues that might improve their ability to care for the child, such as finding employment, navigating the bureaucracy of social services agencies, and transporting children to appointments. Data were collected regularly up to age 21.

(iii) The Chicago Child-Parent Center Program

This program was not evaluated by the method of random assignment but by the method of matching treated children to comparable non-treated children on the basis of age, eligibility for intervention, and family socioeconomic status. It was started in 1967 in 11 public schools serving impoverished neighborhoods. Using federal funds, the center provided half-day preschool program for 3- and 4-year-olds during the 9 months that they were in school. The program provided an array of services, including health and social services, and free meals. It also sought to include the parents, including helping the parents complete school and participate in home visits and field trips. In 1978, state funding became available, and the program was extended through third grade and included a full-day kindergarten experience. Eventually, 24 centers provided preschool and after-school activities, up to second or third grade. The preschool program ran 3 hours per day during the week for the 9 months that school was in session and usually included a 6-week summer program. During the kindergarten years, more services were provided at the affiliated school. Teacher-child ratios were 17:2 for the preschool component and 25:2 for the kindergarten. Participation during the primary years was open to any child in the school. Program participants experienced reduced class sizes of 25 pupils rather than the standard of 35 or more in the Chicago public schools. Teachers, aides, extra instructional materials and enrichment activities were also available. Some children continued to participate in CPC through age 9, for a maximum total of 6 years. 93% of them were Black and 7% were Hispanic.

(iv) Effects of Early Interventions, from the three Studies

The three studies above and other studies of interventions for children from low-income families find that participants experienced increased achievement test scores, decreased grade retention, decreased time in special education, decreased crime and delinquency and increased high school graduation (emphasis added). The gains vary with quality and age at which the program is started, and there are important differences by the sex of the child. Programs differ in the measures they use to evaluate the outcomes and in their intensity and quality. As a result, it is hard to compare the programs using a standard basket of benefits. The CPC program, which is less intensive, produced substantial effects on high school graduation rates, reductions in special (remedial) education, grade repetition and juvenile arrest.

The Perry Preschool Program is the flagship experimental intervention study. Children are followed through age 40. The initial boost in IQ faded by the time the children were in second grade, but the program had substantial effects on educational achievement.

Achievement test scores for the treatment group were consistently and statistically significantly higher through age 14. Participants had higher grades and were more likely to graduate from high school. Substantially less time was spent in special education, and higher high school graduation rates were achieved by participants. Participants were more likely to be employed and to earn more and they were less dependent on welfare. There was substantially less crime among participants both in terms of incidence and severity, a recurrent finding of early intervention programs. However, there was no statistically significant difference in grade retention by age 27 between the two groups, although teenage pregnancy was lower, and marriage rates were higher by age 27 for program participants.

The Abecedarian program boosted IQ, but its effect is concentrated primarily among girls. The overall IQ gap between treatments and controls is persistent over time. The Abecedarian program intervenes in the very early years, and it is known that IQ is malleable when children are very young. This message is reinforced by the fact that the IQ boost was not found among children who only experienced the later intervention. Comparable effects are found for reading scores and math achievement scores. The test score effects persist through age 21, which is the last age analyzed in the reports available to CHLM. There were substantial academic benefits. Treatment group members participated less in remedial special education at age 15 and repeated fewer grades at all ages. High school graduation and four-year college participation rates were high. Participants were less likely to smoke and had better jobs.

Estimated costs and benefits of the Perry and Chicago programs with benefits discounted at a 3% rate were also presented by CHLM (2005), with figures in 2004 dollars. The benefits vary among programs. Perry produced some gain to parents in terms of reduced child care costs, and earnings gains for participants were substantial. The K-12 benefit arises from the increment in student quality and a reduction in special education costs. This benefit is substantial across all programs. The college/adult category represents the extra tuition paid by students who go to college. Crime represents the reduction in direct costs (incarceration and criminal justice system) as well as damage done to victims. This excludes transfers. Welfare effects are modest. Future Generation (FG) Earnings represents the improvement in the earnings of the descendents of the program participants.

Smoking and health benefits were not measured in the Perry and Chicago data. For Abecedarian, there were substantial effects, including major differences in smoking rates. CPC documents a decline in child abuse and the costs of treating abused children. The costs of Perry were substantial but per year were about the average cost of expenditure on public school students. CPC per year costs about $6, 796 for the preschool and $3, 428 for the school-age component (in $ 2004). The benefit cost ratios are substantial: 9 to 1 for Perry; 8 to 1 for Chicago CPC. It has been estimated, by projecting from the age 27 results, that the annual rate of return for Perry is 4% for participants and 12% for society at large. Data on Perry participants through age 40 has also been used to estimate that the rate of return for the participants and the general public as a whole is 18.4%. The rate varies by sex of the participants: the rate of return for males is 21.9%, while for the rate for females is only 12.6%.

Some of the home visitation programs for low-income young mothers have been shown to have modest effects on maternal and offspring behavior and health. Olds (2002; see complete reference in CHLM, 2005) summarizes two randomized trials in Elmira, NY and Memphis, TN, which served predominantly rural white and urban black populations,

respectively. The treatment in both trials involved a series of pre- and post-natal home visits of poor, unmarried, and young women by specially-trained nurses. The visits typically lasted 75-90 minutes, and nurses spent more time with women they deemed to have higher needs. The target areas for this intervention were health-related behavior during and after pregnancy, childcare skills, and personal development (family planning, education, job search assistance).

The Elmira treatment group made better use of community services and exhibited reduced prenatal period smoking, with 75% fewer premature deliveries among smokers. At ages 3-4, children whose mothers smoked 10 or more cigarettes during pregnancy had a mean IQ of 4.5 points lower than women who smoked 0-9 cigarettes. Among the 14- to 16-year-old treatment women, the newborn children were almost 400 grams heavier relative to the children of the control women. The beneficial effects of the program were especially apparent for the most disadvantaged women (i.e., young, poor, and unmarried). After the birth of the child, the disadvantaged mothers who were visited showed better parenting skills and higher quality of the home environment. They also had 80% fewer verified cases of child abuse and neglect. Children of visited mothers had 32% fewer visits to the emergency room, and this effect persisted after the end of the program, though the differences in abuse and neglect faded.

The disadvantaged sub-sample of the treatment group had fewer subsequent pregnancies, longer periods between births, and greater employment rates. These effects were also evident by the time the child was 15. The children of the disadvantaged women reported fewer instances of running away, less criminal activity, promiscuous sexual behavior and smoking. Both parents and children reported less use of drugs and alcohol. Importantly, there were no differences in other behavioral problems. A cost-benefit analysis of the Elmira trial suggests that the program was very successful for low-income, unmarried women. Extrapolating from the results at age 15, the benefits of the program were 4 times its costs. The program paid for itself before the child's fourth birthday, with the primary savings coming from reduced welfare and criminal justice expenditures, as well as increases in tax revenue. However, the program provided no net savings for the sample as a whole, suggesting that targeting, rather than universal provision is appropriate.

The effects for the Memphis trial were considerably weaker, even for the disadvantaged sub-sample. There were no effects on birth outcomes and parenting skills. Many fewer women smoked in this sample, so any reductions were very small. The same may be the case for child abuse and neglect. Children of visited women had fewer health-care visits, especially among the disadvantaged sub-sample. In the first 2 years of life, more visited mothers attempted breast-feeding. At age 4, there were no differences in mental development or reported behavior problems. Visited mothers reported fewer subsequent pregnancies. There were no differences in employment and some evidence of reduced AFDC (Aid to Families with Dependent Children) and Food Stamp use. The children are still too young to perform a reliable cost-benefit analysis on their outcomes.

Much more research is needed on Perry, CPC, and a wide variety of other early childhood program results. These samples and measurements need to be placed in a common analytical framework to better understand the differences in samples, treatments, and effects[69].

[69] For example, are the persistent Abecedarian effects on IQ due to the intensity or the age (4 months) at which the intervention is administered? How important are home visitation efforts?

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