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Children with Different Ages at Exposure to ECD And their Performance in Schooling
A Case in Tagaytay City, Philippines

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List of Acronyms

ECD   Early Childhood Development

ECCE   Early Childhood Care and Education

ECE   Early Childhood Education

ECCD   Early Childhood Care and Development

EFA   Education For All

UNESCO   United Nations Educational, Scientific and Cultural
               Organization

CRC   Convention on the Rights of the Child

Abstract

We investigate a program of Early Childhood Development in Tagaytay City Philippines where children are exposed to ECD at different ages and examine if age at exposure to early childhood development program is important to schooling performance. Controlling for child characteristics, other household characteristics and NGO, we find that children exposed to early childhood development program at age two years to three years have significantly higher mean grade from schooling than those exposed at later ages.

Relevance to Development Studies

This study's relevance is more to Early Childhood Development program providers especially those in the private sectors and NGOs who have more flexibility and possibility to effect program changes if they find reason for such changes. Showing evidence from a specific context that children exposed to early childhood care and education at younger age has better schooling outcome may provide them a good reason to expand ECD program coverage to younger children, especially to below three years old and hence increase their chance at succeeding in school and life. This paper also hopes to be a good basis for a more comprehensive investigation and study on the subject.

Keywords

Early Childhood, Early Childhood Development, School Performance

Chapter 1
Introduction

It is an accepted fact that Early Childhood Development is an important cornerstone for Education. And, Education is vital for Human Formation which in turn is important for Growth. EFA (Education For All) goal number one is pre-primary schooling. In arguing for it, strong evidences were put forward showing that with early childhood education, children have easier transition to primary school, better completion rates, reduced poverty, increased social equality and high economic returns (UNESCO, 2006).

Pre-primary education in most OECD and many middle income countries have been universalized so as to give children in these countries better start in their schooling (Myers, 1995; OECD, 2002; and UNESCO, 2004).

In developing countries the call to governments to step up programs directed at the young children are compelling. It could change the lives of children through better school achievements, hence better chances at succeeding in life to the benefit of their countries as well. Studies show that early childhood development programs have greater impact and benefit for the disadvantaged children or at-risk children majority of whom live in the developing countries (Engle et al., 2007; Grantham-McGregor et al., 2007; and Walker et al., 2007). And these benefits are not only in the short-run but even in the long-run (Barnett, 1995; Currie and Thomas, 1995; Gilliam and Zigler, 2000; and Schweinhart et al., 2005).

It is no surprise then that the twentieth century witnessed a significant expansion of Early Childhood Development Programs in the developing world. Governments took the lead but many early childhood development programs were initiated and sustained by private agencies, charitable groups and NGOs. Not only was there a substantial increase in the number of young children spending time in non-parental care (nurseries and child care centres), but more children participated in structured, purposeful learning activities both before and more typically after age 3 (UNESCO, 1997 as referred to in UNESCO, 2006).

In the Philippines, a law has been passed making one year pre-primary schooling for all children ages five to six years mandatory to underline its importance. Another important ECD program initiative directed to children five years and below was launched in 1999 by the Philippine government in three southern regions of the country which are considered disadvantaged based on child mortality rate, malnutrition and other health indicators. A study evaluating this pilot ECD Program initiative was conducted and found that children who participated in early childhood development programs showed improved cognition among its important findings (Armecin et al., 2006).

The body of evidence showing positive outcome for children participating in ECD program has grown. Aside from those available in the US, many studies have been conducted on other regions of the world and even some in developing countries. (Aboud 2006, Berlinski et al. 2008, Boocock 1995, and Watanabe 2005). That ECD programs positively affect school achievement of

children in primary school seem not a question anymore. A new question, that is our research question, emerges: Does the age at exposure to early childhood development program matter and make a difference in school performance? Knowing that most early childhood development programs at present typically addresses older children, this study, through an early childhood development program in Tagaytay City, found an opportunity within this context to investigate this question.

Our motivation is the research findings from developmental science that claim:

> Research suggests that significant and critical brain development and development of intelligence occurs before the age of seven, particularly during the first three years of life. This process is influenced by a child's nutritional and health status and also by the kind of interactions a child develops with people and objects in the environment. It is highly dependent upon adequate nutrition, stimulation, and optimal care. During these first years, the *key brain pathways for lifelong capabilities are established (or not)*. Once developed, the brain is much harder to modify. Therefore, what happens to a child, and the opportunities provided to a child in the first years are crucial to determining lifelong outcomes. (Consultative Group on Early Childhood Care and Development)[1]

From this and from what we find in the empirical and theoretical literature, we hypothesize that in the presence of a good quality and integrated early childhood development program, starting early in ECD will have greater positive impact to school performance.

This study thus, explores the relationship between age at exposure to ECD, other household characteristics and school performance. Among children exposed to ECD at different ages in the two NGOs in Tagaytay, at what age of exposure to ECD, better school performance is observed? Empirical evidence, currents in research in developmental neuroscience, and bioecological theoretical model that may provide reason why children who received good quality ECD program during the period of rapid brain development may expect better school performance, is discussed in the Literature Review in Chapter 2. Chapter 3 provides details on the data used. We use OLS to explore the relationship between age at exposure to ECD, other household characteristics and school performance. This empirical strategy and the results obtained therein are discussed in Chapter 4 and 5. Chapter 6 concludes.

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[1] The quote is from the ecdgroup website. For details see Consultative Group on Early Childhood Care and Development in the References.

Chapter 2
Literature Review

2.1 Concept of Early Childhood Development and Related Concepts Defined.

In the literature, we find that different organizations and institutions involved with young children have preference for and use different terminologies that basically refer to: a set of integrated and comprehensive programs for the survival, growth and development of young children from birth to primary school. UNESCO uses Early Childhood Care and Education or ECCE. OECD on the other hand uses Early Childhood Education and Care or ECEC. UNICEF, World Bank and the International Child Development Steering Group use Early Childhood Development or ECD. The Consultative Group on Early Childhood Care and Development uses Early Childhood Care for Development or ECCD.

United Nations Children's Fund (2001: 17) states:

'The acronym ECD refers to the comprehensive approach to policies and programs for children from birth to eight years of age, their parents and caregivers. Its purpose is to protect the child's rights to develop his or her cognitive, emotional, social and physical potential. Community based services that meet the needs of infants and young children are vital to ECD and they should include attention to health, nutrition, education and water and environmental sanitation in homes and communities. The approach promotes and protects the young child to survival, growth and development'

In addition to the above, the guide provided by UNESCO to understanding the concept of ECCE by explaining each term is helpful too in understanding not only the acronym ECCE but also the other acronyms used by other organizations mentioned in the opening paragraph of this chapter. UNESCO (2006) clarifies:

That the term *Early Childhood* covers the period from birth to primary school (6-8years old)[2], the time of remarkable brain development that lays the foundation for later learning. EFA Reports use this convention but there are others[3] who use pre-birth to primary schooling to refer to early childhood. ECD programs of the two NGOs where this study was conducted are more compatible with the latter concept of early childhood.

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[2] In general, between 6- 8 years old, variation depends on countries' primary schooling age.

[3] Like ecd group. See www.ecdgroup.com

That the term *Care* in Early Childhood Care and Education generally includes attention to health, hygiene and nutrition within a nurturing and safe environment that supports children's cognitive and socio-emotional well-being.

That the term *Education* in Early Childhood Care and Education is broader than pre-schooling, capturing learning through early stimulation, guidance and a range of developmental activities and opportunities in any setting.

That care and education in practice cannot be separated, and a good quality provision for very young children necessarily addresses both dimensions (Choi, 2002; Myers, 1995; and OECD, 2001 as referred to in UNESCO, 2006). In this respect, care and education are parts of a whole: both are needed to foster holistic growth, development and learning.

That ECCE then supports Children's survival, growth, development and learning –including health, nutrition and hygiene, and cognitive, social, physical and emotional development – from birth to entry into primary school in formal, informal and non-formal settings. Often provided by a mix of government institutions, non-government organizations, private providers, communities and families, ECCE represents a continuum of interconnected arrangements involving diverse actors: family, friends, neighbours, workers and diverse arrangements: family day care for a group of children in a provider's home; centre-based programs; classes or programs in schools; and programs for parents.

This study uses the term ECD but it is clear that ECD, ECCE and ECCD refer to a set of integrated and comprehensive programs that support children's survival, growth, development and learning. And it can be in a formal and informal setting. In this study, ECD refers to a centre-based program for children ages two years to six years.

2.2 Why ECD? Importance of Early Childhood Development

2.2.1 Importance of ECD in general

The child's right to survival, growth and development is enshrined in the Convention on the Rights of Children, a document that gained near universal ratification in 1989 (UNICEF, 2001). ECD then is a child's right.

If we subscribe to the idea that Human Capital Formation is important to economic development, Early Childhood Development, increasingly recognized as vital to human capital formation, is important to economic development too. Proof of this recognition is the strong case made for early childhood development by UNICEF and International organization working for the welfare of children such as CGECD, International Steering Committee for Early Childhood Programs and call on governments to step up efforts to make ECD Program available to more children to help improve human development potential. And, EFA in placing ECD as goal number 1 affirms its importance to overall Education for All goals. (UNICEF, 2001; OECD, 2001; UNESCO, 2006)

Early Childhood Development Program is said to promote positive developmental outcomes and empirical studies evaluating ECD Program's im-

pact on developmental outcome are not lacking. Studies done in the United States showed that there are positive developmental outcomes especially to disadvantaged children from poor families which are not only short term but also long term (Barnett, 1995; and Gilliam and Zigler, 2000) .

Similar review of early childhood development program evaluations in 15 countries outside of the US was done by Boocock (2005). These countries are Canada in North America; UK, France, Germany, Sweden and Ireland in Western Europe; Hong Kong, Japan, Singapore, South Korea, Australia and New Zealand in East Asia and the Pacific; and Colombia, Turkey and India for Developing Nations in Latin America and Asia. Some of the studies are large scale evaluations done by governments to evaluate government funded programs as in Western European countries while some are small comparative studies in countries outside Western Europe. The author concludes from these review of studies: 'Attendance at preschool programs is associated with cognitive gains and improved performance in school the world around, and it also appears that having some preschool experience matters more to children than exposure to any particular curriculum or program model as long as the program is not of very poor quality.' (Boocock, 1995: 109)

Still several studies conducted in the developing countries that provide empirical evidence to the positive impact of ECD to children's school achievement are the work of Berlinski (2008) in Argentina on a large scale government ECD program, Watanabe (2005) in Vietnam with a small number of children, Aboud (2006) in rural Bangladesh and the one of Armecin et al. (2006) in the Philippines.

To children exposed to risks, ECD is seen to ameliorate or mitigate these risks, to promote protective factors, and to reduce mortality, disease and malnutrition and to improve cognition among children (Engle et al., 2007; Grantham-McGregor et al., 2007; and Walker et al., 2007).

There are social and economic benefits too in investing in Early Childhood Development Programs. Schweinhart et al. (2005) on the Lifetime Effects of Preschool (Perry Pre-school program) through age 40 is an example in this line of studies. The highlights of the findings of Schweinhart et al. (2005: 256) showed: 'strong positive impacts from participation in the program and strong positive gains for the general public in providing this program'. Specifically, in terms of measured economic returns to society, using age 27 data: for every $1 investment, $2.54-$8.74 was recouped in terms of benefits over the entire time frame; using the age 40 data, for every $1 investment, $6.87-$16.14 was recouped in terms of benefits over the entire time frame. The social impact is in terms of less crime involvement and welfare payments. The economic benefit is in terms of higher earnings and taxes paid to governments. However, Schweinhart et al. (2005) are quick to point out that it is not certain whether the impacts they found would hold in other economic conditions not from low-income families at-risk of school failure. Barnett (1995) had also shown using benefit cost analysis that benefits not only to the individual but to the general public and society as a whole outweigh the costs of providing ECD program. Likewise Karoly et al. (2005) in a scientific research done for private institutions wanting to invest in early childhood development found that ECD is a worthwhile investment. The findings of Lynch (2005) led him to conclude

that investments in ECD is not only economically viable but yields a high pay-off.

2.2.2 Importance of ECD to Developmental Outcomes of children from low income families

Most of the evaluations of the impact of ECD Programs to developmental outcomes have been done in the United States. It would have been more fitting to review studies from the Philippines where this study was conducted but as there is no available published data and there was no ample time to research unpublished data that may have existed in university libraries, this study had to rely on literature from where it is available that focuses on the same study area. Thus, in this section we review studies that specifically focused on ECD Programs' impact to developmental outcome of children from low income families. This is because the sample being studied in this research is from the low-income families.

We choose two of the more comprehensive and rigorous evaluations of ECD Program impacts by Barnett (1995), and Gilliam and Zigler (2000).

Barnett (1995) studied 36 Evaluated ECD Programs in the US from both Model Program type and Large Scale Public Program type and examined their long-term effects on children from low-income families. Model Programs are those run by university or charity group while the large scale programs are those nationally funded and run like the head start program. Developmental Outcomes were evaluated for cognitive impact through IQ, School Achievement thru school grades and achievement tests, Grade Retention and Placement on special education and social adjustment. Findings of the study: 'ECD Programs can produce large short term benefits for children on IQ' and 'sizable long-term effects on school achievement (Language and Math), grade retention, placement on special education and social adjustment' (Barnett, 1995: 43). It is not the best of studies as the 36 Evaluated ECD programs have different methodological approaches which posed difficulty and challenge. Not all of the 36 evaluated programs used random assignment of children to ECD Program which is a limitation seen on the study. However, Barnett justified his study in its usefulness to complementing results from the often cited High/Scope Perry Pre-school and Abecedarian which may have used random assignment of children to the program and control group but mainly focused on African-American children and this too limits generalizations. Barnett instead focused on children from low-income families from diverse cultural background which is more useful for this study. And, comparing model programs to large scale public programs, model programs yielded larger effect (Barnett, 1995). Barnett attributed this larger effect to the fact that model programs (university and charity) are smaller, with better quality than most large-scale programs.

Gilliam and Zigler (2000) chose a different group for their study: state funded and managed ECD Programs in a classroom setting directed to disadvantaged children 3-5 years old from poor families. They used critical meta analysis in their review of the evaluated state funded ECD Programs. Like Barnett, the study met many challenges due to the varied methodologies employed in the evaluation of the 13 ECD programs included in the study. But as

he puts it, 'these evaluations represent our current best estimate of the impact of this important and increasingly prevalent type of preschool program for mostly low-income children. Therefore, despite considerable differences and limitations in the methods used to evaluate these programs, a review of their findings is useful' (Gilliam and Zigler, 2000: 485). Their findings were not much different from the results obtained by Barnett (1995) in the large scale public pre-school programs: positive but short term effect on cognitive development and large and long term effects on school achievement, grade retention, drop out rate and referral to special education programs. In addition to the above, two states (Michigan and North Carolina) reported to have found a relationship between program quality and positive developmental outcome in their evaluation (Gilliam and Zigler, 2000: 465).

2.3 Does Age at Exposure to ECD Matter? Why it may matter?

We give here three reasons we find in the literature why it may matter. First, while many studies find no result supporting that age at exposure matters, we found two studies that evaluated the impact of early childhood development program that reported important and greater developmental outcomes to children age below three years. We look at these studies here. Second, although debate continues among neuroscientists, there is increasingly convergence in their findings on the fundamental plasticity of the brain especially during the early years and on its susceptibility to influences of early experiences and stimuli during this period (Johnson, 2001). This is especially seen to be important in the first two years of life in the human brain development (Johnson, 2001). Third, new currents in research in Behavioral genetics that recognizes the importance of the environment to a person's development. This current gave rise to a new model, the Bioecological Theoretical model of development which will be discussed in section 2.4.

2.3.1 Empirical Evidences

Leseman et al. (1998) in a statistical meta analysis of evaluation studies of 18 methodically sound center-based preschool programs (including Head Start and model programs) published between 1985 and 1996 examined the relationship of program design and implementation (quality), to outcome measure (IQ & non verbal cognitive, language and pre-literacy and socio-emotional), age of onset (timing or age at exposure to pre-school programs), professionality of intervention agents and pedagogical concept. Interestingly, he found stronger effect sizes for a start at or before age three compared to a later start. Other findings of their study: Stronger results in the cognitive and language domain than on socio-emotional; stronger effects for professionals than for paraprofessionals and parents; and stronger effects for a child following (child-centered), developmentally appropriate approach than for a didactic approach. (Leseman et al., 1998 as cited in Leseman, 2002: 24)

This finding of greater effect sizes on developmental outcomes of children age three years and below was also reported by Armecin et al. Their study conducted in the Philippines evaluating the 1999 ECD initiative of the Philip-

pine government in three southern regions of the country used longitudinal data collected over three years with 6,693 children with ages 0-4 years at baseline. There are two treatment regions and one control region. The study used difference-in-difference propensity score matching with three rounds of evaluation: at baseline, then at round 2 and 3 evaluations. It sought to find out ECD Program's impact not only on developmental outcomes but also on nutrition and health. Furthermore, it sought to find out if there are differences in impacts on the duration of exposure and on the age of children at exposure. The study found 'significant improvement in the cognitive, social, motor and language development and short-term nutritional status of children in the ECD program areas'. Furthermore, they also found that 'among children below age four years at the time of round 3 (meaning, below two years at the time of baseline survey), there has been substantial improvement in cognitive, social, motor and language development for those in the program areas relative to non-program areas. Program impacts on cognitive skills at young ages range from .92 to 1.2 standard deviation higher for the two year olds and .28 to .43 standard deviations higher for three year olds. (Armecin et al., 2006: 22)

2.3.2 Findings from Developmental Neuroscience

Recent findings from Developmental neuroscience tell us that the brain structures undergo its most dramatic development during the first years of life (Benton, 2010; Johnson, 2001; and Shonkoff and Phillips, 2000). That compared to the rest of the body, brain development occurs at an earlier stage: 'the brain weight of a newborn is about 10 percent of body weight, while in the adult it is only 2 percent. By the age of 1 year, the child will be about 15 percent of the final body weight but the brain will be already about 70 percent of that of a young adult.' (Benton, 2010: 458). Furthermore, 'By the age of two, toddlers' brains are as active as those of adults. By the age of three, the brains of children are two and a half times more active than the brains of adults – they stay that way throughout the first decade of life.' (Shore, 1997: 21).

It is also found that brain development commences very early after conception. It proceeds in overlapping phases. They are the making of the brain cells, getting the cells to their place (migration) and creating a system to link the nerve cells by growing axons and dendrites (Johnson, 2001; and Shonkoff and Phillips, 2000). That the 'junctions through which information passes from one nerve cell to another are called synapses' (Bransford, 1999: 104). During the development process they form a 'wiring diagram' of the brain. We also learn that they are basically added to the brain in two different ways:

First, the overproduction of synapses in the early years and the selective loss. About this, Bransford (1999: 104) tells us: 'The nervous system sets up a large number of connections; experience then plays on this network, selecting the appropriate connections and removing the inappropriate ones. What remains is a refined final form that constitutes the sensory and perhaps the cognitive bases for the later phases of development.' (Bransford, 1999: 104). Huttenlocher and Dabholkar (1997) clarifies that synapse overproduction and selection are not a linear proceeding, they progress at different rates in different parts of the brain. Synapse formation and the peak density of synapses occur at different ages in different areas (Johnson, 2001; and Shonkoff and Phillips, 2000).

We further learn from Bransford (1999: 104) that: 'Synapse overproduction and loss is a fundamental mechanism that the brain uses to incorporate information from experience' to its development. In other words, synapse overproduction is already influenced by early experiences.

Second, the addition of new synapses, a lifelong process, is driven by experience and learning. This second process, according to Bransford (1999), Shonkoff and Phillips (2000), continues the reorganization of the wiring diagram of the brain but the first process provides the base.

Shonkoff and Phillips (2000) used Figure 1 on Human Brain Development to illustrate the dependency of synapse formation on early experiences. We see from this figure the critical period of the first three years where the synapse formation for sensory, language and higher cognitive function peaked.

Figure 2.1
The Human Brain Development
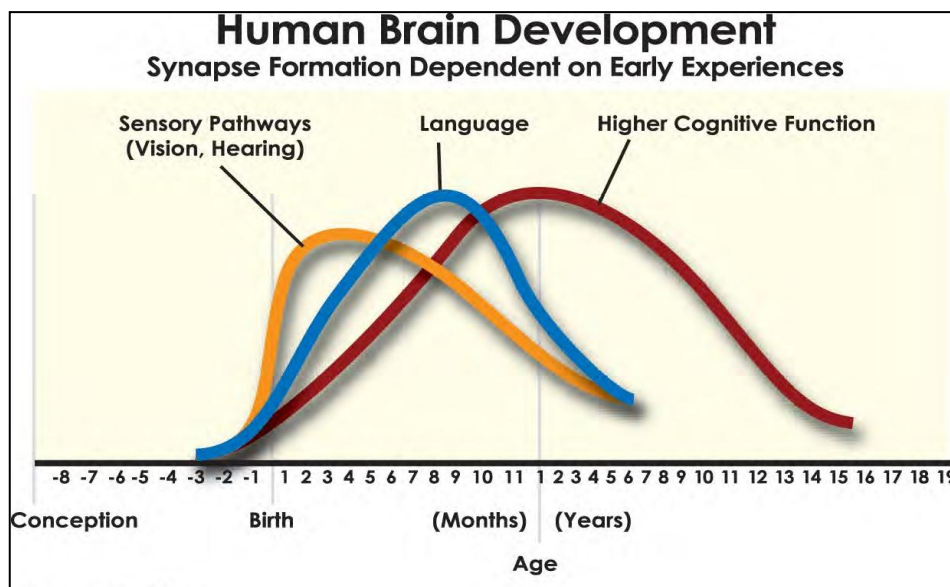
Source: Nelson, C.A. in Shonkoff (ed.) 2000: 188; in Center on Developing Child at Harvard University 2007: 3.

From The Center on the Developing Child at Harvard University (2007) we learn that the nervous system is made up of billions of highly integrated sets of neural circuits, that are 'wired' under the interactive influences of genetics, environment, and experience. The formation of these circuits - of these wiring diagrams - is determined by genes. But it is a child's experience that shapes them. It selects the appropriate connections and removes the inappropriate ones.

Bransford (1999) explains that what can be learned from this is the fact that learning changes the physical structure of the brain, it organizes and reorganizes it. And different parts of the brain may be ready to learn at different times. We quote him: 'The quality of information to which one is exposed and

the amount of information one acquires is reflected throughout one's life in the structure of the brain' (Bransford, 2000: 105).

Kotulak adds: 'These windows of development occur in phases from birth to age 12 when the brain is most actively learning from its environment. It is during this period, and especially the first three years, that the foundation for thinking, language, vision, attitudes, aptitudes and other characteristics are laid down. Then the windows close and much of the fundamental architecture of the brain is completed'. (Kotulak, 1997: 7)

While the early years of life are particularly important, there is however 'no sharp break at the age 3 or 5' according to Shonkoff and Phillips (2000: 412).

Critical and Sensitive Periods:

It is known, that there are *critical times* in brain development. Bruer (1999) states that the period in the first three years, the time rapid synapse formation that connects nerve cells into functioning circuits occur is the critical period in brain development. This means that during this period, enriched environments and increased stimulation can have the greatest effect. This is also the time during which certain kinds of stimulus are required for certain brain areas to enable a normal development. Deprivation of those stimuli during these period results in abnormal brain development (Bruer, 1999).

A classical example used to illustrate this is the development of vision: We can see the importance of visual stimuli over the first months of life in infants with congenital bilateral cataract. In the absence of a visual input the development of the visual cortex fails. Even when the cataracts are removed at an early age, the visual acuity doesn't reach normal adult levels (Johnson, 2001). This shows the need for sensory input for normal brain development.

Aside from critical periods, there are *sensitive periods* for brain development. Usually they represent a less precise and often longer period of time when skills can be influenced. Those influences can be experiences and instructions. The learning of language is an example (Shonkoff and Phillips, 2000; Newberger, 1997). A quote from Newberger (1997: 6) illustrates it better:

> Talking to an infant increases the number of words she will recognize and eventually come to understand…An infant's repeated exposure to words clearly helps her brain build neural circuitry that will enable her to learn more words later on. For infants, individual attention and responsive, sensitive care-giving are critical for later language and intellectual development.

We see how environment has an enormous hold on how the 'wiring diagram' of the brain will look like: 'Neural plasticity, the brain's ability to adapt to experience, confirms that early stimulation sets the stage for how children will continue to learn and interact with others throughout life.' (Newberger, 1997:5)

Again, looking at Figure 2.1 we see this. The Center of the Developing Child (2007) explains that, the first years in particular, the period between birth and three years, are a time of rapid development of cognitive, linguistic, social, emotional and motor skills. There is an explosive growth in vocabulary which usually starts at the age of 15 – 18 months and continues into the preschool years.

We can conclude with Bransford and Bruer. Bransford (1999) states that some experiences have the most powerful effects during specific sensitive periods, while others can affect the brain over a much longer time span. And Bruer (1999) says that during the first three years in human life enriched environment and increased stimulation can have the greatest effect on brain development.

Early Childhood Development can take advantage of those critical and sensitive periods and should use those windows of opportunity.

We agree to the statement by UNESCO (2006: 12): 'Although early childhood is a period of great potential for human growth and development, it is also a time when children are especially fragile and vulnerable.'

It is because as Grantham-McGregor and International Child Development Committee (2007) and Benton (2010) explain, Brain Development is modified by the quality of the environment. Grantham-McGregor and ICDC (2007) furthermore say that researches on animals show, that negative influences, such as early under nutrition, iron-deficiency, environmental toxins, stress, poor stimulation and social interaction can affect the structure and the function of the brain. These influences are stronger in situations of poverty. It is where ECD can play a crucial role to mitigate its negative effects and provide protective factors.

2.3.3 Behavioral Genetics

Only four decades ago, the leading theory on child development and learning had its foundation on a genetical approach: also called the Maturational Model. Maturationists believe in a biological process that occurs naturally and automatically in predictable stages at a certain time. In this context, children will develop according to a predetermined biological timetable. But there are valid reasons to believe that this might not explain all aspects of human functional brain development. (Johnson, 2001). Especially in the 90's this model was met with growing criticism. Friston and Price (2001) state that those classical models provide an incomplete account of the real brain architecture.

Bronfenbrenner is one of those who seriously questioned the hypothesis of the direct genetic regulation, the basis for prevailing behavioral genetics paradigm at that time that basically believe that development happens in a genetically programmed way, regardless of the experiences or training received. He introduced an interactionist model (of the interactive specialization approach) which can be characterized by the 'proximal process'.

This model assumes that the actualization of a genetic potential into a phenotype is through the continuous interaction of the individual with physical, social and cultural-symbolic environment (Lesemann, 2002). In this interactionist model, the bioecological model, which was introduced in 1994 and is still evolving, the importance of early experiences (also called proximal processes) provided to the child is important contrary to the behavioral genetics-based paradigm (Bronfenbrenner and Ceci, 1994). This model complements more the findings of the leading experts in the field of developmental neuroscience on the 'fundamental plasticity of the brain and low degree of genetic prespecification of neuro-structures underlying complex cognitive, emotional and social functions and behavior' (Leseman, 2002: 7).

2.4 The Bioecological Model

The Bioecological Theoretical Model, an alternative model to that of the behavioural genetics paradigm that dominated research in the behavioural science up to the 90s but now seriously questioned, also provides basis why sustained, intense and quality ECD program (which are considered proximal processes) could improve developmental outcomes.

Bronfenbrenner's bioecological theory of development postulates that development is a joint function of the person and all levels of their environment. The former includes personal attribute factors that are both biological and psychological (e.g., genetic heritage, and personality).The latter includes physical, social and cultural-symbolic environment (Bronfenbrenner and Ceci, 1994).

In this model, the focus is on the mechanisms of organism-environment interaction. This is what he calls the 'proximal process', a process, through which genotypes are transformed into phenotypes (Bronfenbrenner and Ceci, 1994).

Proximal processes are the engines of development (Bronfenbrenner and Evans, 2000). Its outcome can be characterized with two terms: competence and dysfunction. 'Competence is the demonstrated acquisition and further development of knowledge, skill or ability to conduct and direct one's behavior across situations and developmental domains. Dysfunction refers to the recurrent manifestation of difficulties in maintaining control and integration of behavior across situations and different domains of development.' (Bronfenbrenner and Morris, 1998: 1002).

Proximal processes or the interaction of the organism to the environment is 'supposed to have a quantitative aspect – duration, regularity, continuity, increasing complexity – and a qualitative aspect – reciprocity and culturally specific contents – determining the efficacy in actualizing genetic potential in a given cultural context' (Lesemann, 2002: 6).

In this model of Bronfenbrenner and Ceci (1994), heritability, which refers to the proportion of variance attributable to actualized genetic potential, is particularly considered. Looking at individuals that grow up in the same surroundings, it describes to which extent genetic endowment contributes to observed differences in the developmental outcome. The degree of heritability can be influenced through the conditions and processes in environment. The assumption is that 'proximal processes serve as mechanisms for actualizing genetic potential,' and that they 'should lead not only to higher levels of heritability, but also to more advanced levels of developmental functioning.' (Bronfenbrenner and Ceci, 1994: 570).

ECD Programs which constitute proximal processes (interaction of the organism to the environment, i.e. child-person or child-object, etc) in the Biocological model, are given importance and together with genetics and environment play a role in the development of the child or person.

To conclude with Duncan (1992), the strength of Bronfenbrenner's work lies in its revealing how perceptions and interactions in relationships and in settings such as poverty neighborhoods or child care and education can make a difference for children's well-being .

Chapter 3
Data and Descriptive Statistics

In this Chapter, we provide details on the nature and source of our data. Section 3.1 will provide criteria for the sample selection for this study; Section 3.2 will give more details on the Support for Education and Health Program including how the two NGOs select the children for the program; Section 3.3 will discuss the important features of the ECD Program since the age at exposure to ECD program, the variable of interest, is within the context of the said programs in BP and Pagasa; Section 3.4 visits Tagaytay City for some context to the families of the sample; and 3.5 gives some descriptive statistics and profile of the sample. Interview with Program Coordinators and ECD Staff of the two NGOs provided the information for this Chapter.

3.1 The Data

This Research Paper made use of secondary data gathered from two NGOs running a program called Support for Education and Health (among its many other programs and activities) in Tagaytay City, Philippines. Together, these two NGOs Bukas Palad and Pagasa targeted poor families in the city and facilitated support for education and health for children of these families since 1993. These supports are for early childhood development program, elementary education, secondary education and college education. The nature of the program necessitates follow-up of children they are supporting, hence it was possible to obtain updated data such as school grades and socio-economic indicators. These data provide the key to this research.

Since the interest in this research is to investigate the relationship between age at exposure to early childhood development program and performance in schooling, the sample included only full sample of children: (i) who are in the program of support for education and health in the two NGOs, (ii)who were exposed to early childhood development program in the centre-based early childhood development program of Pagasa and Bukas Palad, (iii)who are in the elementary and secondary school (first and second years only) in the school year 2009-2010. And, these children study in the same public school.

The study originally aimed at looking at the effect of ECD to Schooling Performance by comparing children with and without ECD exposure. However, it did not become possible since at the time of data gathering, there is no record available in the NGOs about children's early childhood development exposure outside of those children who attended early childhood development in their centre.

3.2 Support for Education and Health Program of Bukas Palad and Pagasa

The Program as Support for Education and Health, has its beginnings in 1993 as Adoption at A Distance[4] promoted by AMU[5] in collaboration with the New Families Movement. In 2000-2001, the name of the program was changed to Support for Education and Health which was considered to be the more appropriate name. Working in solidarity with private individuals, families and associations of goodwill especially from Developed countries, it provided children of families from poor circumstance in Developing countries, support for education and health.

The two NGOs, having basically the same funding source, have the same program philosophy and follow the same selection criteria for program partners. Although the program targeted the poor, selection is random based on two criteria: One, that the child belongs to a family that has established at least two years of residency within the geographical area of operation of the NGO; and two, that the child comes from a poor family as evidenced by their dwelling, job and income status. When the program was launched, there was more than enough support available for children within their respective areas of operation that Pagasa even expanded its area of operation to satisfy available program funds.

Geographically located in opposite sides of the city, Bukas Palad and Pagasa operate within their respective geographical area of concern among households present therein. Close coordination between them is maintained to make sure that no child receives double support.

This support for education and health can be given for Early Childhood Development Program, Elementary Education, Secondary Education or College Education or all of the above.

The Support for Early Childhood Education takes the form of participating in a centre-based program. This is a two and a half to three hours, five days a week program. It follows a routine based on a Developmentally and Age Appropriate Curriculum. Both Bukas Palad and Pagasa have centre-based early childhood development programs. However, Bukas Palad offers the program to children age two years to six years. Pagasa's ECD program on the other hand caters only to four years old to six years old children due to longer distance of most families to the centre. Recently Pagasa started a playgroup for three years old children but none of them is yet included in the sample.

The Support for Elementary and Secondary Education takes the form of free school uniforms and subsidized viand for children. School Fees, rice and books are the family's counterpart. Why uniform and subsidized viand? The NGOs explain that children from poor families could fail to attend school just by having no dress or shoes to wear. Providing them with a pair of uniform

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[4] To date, 13,000 children in 41 countries in 4 continents receive similar kind of support.

[5] For details on AMU, see http://www.amu-it.eu. Downloaded 25.08.2010 15:42

helps solve this problem. Also the subsidized viand assures lunch for the children which could also be a reason for a child's absence from school-no lunch or no money to buy lunch. Medical and Dental check-up and care are the other services provided for the children. A library service with books is also another service where children can come especially on weekends to study and do assignments together. Likewise school supplies at subsidized prices are provided.

Support for College Education will not be discussed here since this is not part of the study.

Bukas Palad and Pagasa together support more or less one thousand children from poor families in Tagaytay City.

3.3 The ECD Program of Bukas Palad and Pagasa

Bukas Palad and Pagasa follow a child-centred and developmentally appropriate practices in their ECD program. This was adopted from the training institute that provides not only the basic training for their ECD staff but also the continuing staff development through summer workshops, seminars and exposures to the institute's school for children. The institute is a leader in early childhood education in the Philippines and its school for children serves also as a laboratory and training ground for NGOs, public schools teachers and supervisors, and private institutions with ECD programs wanting to train. As a consequence of this and of the NGOs goal to provide good quality ECD program to their children-partners, we find the following practices in Bukas Palad and Pagasa ECD centres: Small number of children in a class; Continuing staff development for their ECD teachers and paraprofessional teachers; Parent education programs; Child-centred and developmentally appropriate curriculum; Daily nutritious meals for children within the centre-based program; Medical and dental clinic services and subsidized medicines; and Parents considered as partners to children's education and provided support for learning.

Small number of children in a class. There is an average of 18 children per class for the age two to three years and 20 children for the age three to four years. The age five to six years class has an average of 25 children per class.

Adult-child ratio. Each class has 1 main teacher and 1 adult assistant. This gives an adult-child ratio of 1:9-13 or a teacher-pupil ratio of 1:18-25.

Teacher qualitfication. There is basic training before staff is allowed to handle children's class and there is continuing staff development and enrichment done by the training institute for the two NGO's ECD teachers and paraprofessional teachers. Selection of teachers and ECD staff by the two NGOs is based more on interest to work with children, capability to engage children and facilitate activities with children rather than on college diplomas in teaching. We therefore find college degree holders and non-college degree holders among their ECD teachers. However, basic training on ECD is a must for a would be teacher.

Child-centred approach. Children are listened to. Curriculum-based activities are not rigid and can be changed if this is to the benefit of the children in terms of interest or participation.

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Parent Education. Parents are considered important partners in the education of young children. In this regard, parent education with modules on nutrition, preventive health care, hygiene, child discipline, family life, etc is provided. Likewise, Parent Workshops on language, math, science, arts, etc., are also provided. It is the aim of these educational programs and workshops to help equip parents with knowledge and skills to become better carers and teachers of their own children first and other children they come in contact with in their community as well.

Integrated ECD program. Another important part of the program is the provision of daily nutritious meals for children within the centre-based program. Medical and Dental check-up and care as well as subsidized medicines is at the service of the children in this program too. The two and a half routine based on age and developmentally appropriate curriculum is to help children in their cognitive, language, socio-emotional, and psycho-motor skills development.

It is important to state here that Pre-primary education is now compulsory for five-year-old children in the Philippines (The Early Childhood Care and Development Law 2000). There is provision for pre-primary education for all children in this age group in the public schools although children may also attend in private schools or NGOs accredited by the Department of Education. For the age group three-year-olds to early five- year-olds, the government provides ECD service through the Day Care Centres with at least one day care per barangay (or village), as mandated by law (The Republic Act 6872, the Barangay Level Total Protection Act).

How does these practices mentioned compare with national recommended practices?

de los Angeles Bautista (2000: 66) in Excerpts from the Philippine Country Case Study on ECCD Indicators reports on the following:

On the number of children per teacher/caregiver: Referring to the national situation in the teacher-student ratio:

> The teacher – student for five-year-olds in public schools is high at 1:39, and also high for private schools at 1:37 (based on the most recent year available). It is not surprising that most activities for children in kindergarten classes are sedentary whole-group or large-group activities. This allows the teacher to manage a large group of children. However, this cannot be considered a developmentally appropriate practice for five-year-olds in group settings who need more active engagement with people and materials, as well as a balance between whole- group and small-group activities.

The report makes note however that good data in Philippines' ECCD situation is lacking and because of this, the country team working on the country ECCD indicators of good practices used the result of their survey among public, private and NGOs which is not complete.

Again de los Angeles Bautista (2001: 66) on children ages three years to five years:

> The adult-child ratio for day care centres with three-to-five-year olds is also high at 1:35, considering that the day care worker usually has two different groups of children within a full working day and that three-year-olds are part of the group.

According to the Report (de los Angeles Bautista, 2001: 66): 'The recommended adult-child ratio is 1:25'

On this indicator, BP and Pagasa practice is within the recommended ratio of 1:25 by the national team on national ECCD indicator of good quality practices.

Another practice that could be compared or checked with national standards is the matter on *Teacher/Caregiver Qualification*. De los Angeles Bautista (2001: 67) on behalf of the working group reports:

> It is also important to reiterate the consensus reached at the workshop on indicators that academic degrees or qualifications on paper do not guarantee that an individual is effective caregiver/teacher of young children or facilitator. At the same time, it is acknowledged that intensive training and education is required before an individual may be assigned to be responsible for groups of very young children. There is a need to exercise caution in developing standards for teacher and caregiver qualifications that may exclude the cadres of community workers and volunteers, often parents, who have training and experience in implementing ECCD programmes but who may not have the academic qualifications...Balancing "ideal" expectations with the current reality is necessary and provides a basis for developing and implementing a phased or carefully planned career and professional development framework for ECCD workers.

Bukas Palad and Pagasa is in accordance with this framework.

The third which we can check with national recommended practices or indicators is on the *curriculum*. While acknowledging the importance of curriculum, the team focused on interaction. This simply means a child-centred curriculum must be directed at a child's engagement and participation in the learning process and prepared curriculum can be revised during implementation if revision is found more suited to the needs and interest of the children concerned. De los Angeles Bautista (2001: 69) in the report writes:

> It was agreed (by the working committee) that the focus must be on the 'interaction' (adult-child, child-child and child environment) rather than on curriculum as it is planned on paper..

BP and Pagasa is in-sync on this indicator too.

It is not in the scope of this study to determine the quality of BP and Pagasa ECD Program whether it is high quality or low quality. In this section we looked at the important features of their ECD Program and compared it with the current situation of Philippine ECCD indicators and what is recommended for good ECD provision by the national team in line with the Search for ECCD indicators done globally that will allow comparisons of ECCD programs across countries. *We found Bukas Palad and Pagasa ECD program is in accordance with the recommended standards by the Philippine team working on country eccd indicators for good quality ECD program based on the above mentioned indicators.*

This is important because in the literature, we find that the quality of ECD program is important for outcome.

Smith (2003), on the nature of Quality in ECE (ECD) writes that participation in early childhood development program is not a guarantee for good schooling outcome. That 'research has demonstrated that quality makes a difference to cognitive development' (Smith, 2003: 3 citing Wylie C. et al., 2001; Burchinal M.R. et al., 1996; Cryer D., 1999; Helburn S.W. et al., 1995; Howes C. et al., 1993; Howes C. et al., 1995; Whitebook M. et al., 1989; and Wylie C. et al., 2001). She gives two main dimensions of quality, the Structural quality

and the Process quality. Of Structural quality, that 'there are three key aspects described as the iron triangle (to describe their importance and inter-relationship)' and this includes 'group size, staff-child ratios and teacher quali-fications' (Smith 2003:3 citing Ochiltree G., 1994). Of Process quality, Smith (2003: 3 citing Lamb M.E. et al 1998) defines, 'it involves the social relation-ships and interactions within early childhood program settings'. Furthermore, studies show that 'teacher-directed curriculum model have been associated with poorer long-term outcomes' (Smith 2003: 3 citing Sylvia K., 1997 and Schweinhart L.J. et al., 1997) .

It can be safely said therefore that BP and Pagasa ECD Programs meet the national recommendation for quality ECD Program based on the im-portant indicators also mentioned in the literature as cited by Smith (2003) above.

3.4 Tagaytay City

The study was conducted in the city of Tagaytay where an integrated ECD program for children operates, which is the interest of the study, but it could have also been conducted in another city if such a program or similar program that is open for research. Hence Tagaytay was chosen only because of the availability of early childhood development program open for student re-searchers.

Tagaytay City is a city with 61,623 people[6]. Located 2,500 feet above sea level, Tagaytay is endowed with a cool and invigorating climate. Its tempera-ture averages   22.7 degrees Celsius. It is this favourable climate and famous scenic volcano within a lake that has attracted both tourists and the rich to come to this place to rest and/or to reside. Construction of resorts, private rest houses and vacation houses, hotels and other tourist amenities has spurred the growth of the city in the last two decades.[7] Accompanying this growth is the tremendous rise in the price of land and real estate in Tagaytay and the rise of landless families living in high density areas in the city. Most of the poor children who make up the sample for this study come from households in the-se high density areas. Others come from the outskirts of the city but within the geographical area of the city.

3.5 Descriptive Statistics: The Profile of the Sample

In section 3.2 we described the Support for Education and Health Program from where we obtained our sample and how we selected them. It is a full sample of (i) children who are in the support for education and health; (ii) who were exposed to ecd programs of Bukas Palad or Pagasa; (iii) who are enrolled in the primary and secondary (1st and 2nd) in school year 2009-2010.

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[6] As of 2007 survey as given in the website http://www.Tagaytay.gov.ph

[7] Also from the website www.Tagaytay.gov.ph

We also explained in that section that the Support for Education and Health is targeted to the poor and that selection of program partners is random based on two criteria: (i) that the family of the child has at least two years of residency within the geographical area of operation of the NGOs without plans of moving out of said geographical area in the next two years (ii) is considered poor as evidenced by dwelling, job and income status.

Table 3.1 shows the summary of the Sample's Profile based on sex, age, level of schooling, her or his family size and income, and his or her parents' education and job.

We see from the table that there are more girls (54.98 percent) than boys and most of them (about 75 percent) are in the six to twelve age group. Majority of families have four to six members. We also see that children in the sample are largely from families earning $1a day (64.94 percent) and $2 a day (33.23 percent). Only a small percentage (1.81 percent) has earnings above $2 a day but less than $3 a day. Most of these children's parents work in the informal sector for wages and salaries but mainly wages with no social security benefits as is the case with informal sector workers. Eighty three percent of fathers work for wages as labourers, plumbers, carpenters, and masons in construction projects or as jeepney drivers, tricycle drivers in services. About forty one percent of mothers work for wages as laundrywomen, housekeeping workers in institutions and private homes, reflexology workers, etc. Those who work for salaries work as vacation houses caretakers, gardeners, family drivers, salesladies and the like. The difference between the wage earner and the salary earner is not so much in the security of tenure or social security benefits (the few who may have such benefits are exceptions rather than the rule) but more on the manner of payment for their labour. The other is paid daily, weekly or bimonthly while the other is paid monthly. A very small percentage (13.07 percent) of fathers in the category of jobs are self-employed or engage in small enterprises such as vegetable and fruit production and also being sales agents for boats and resorts. In Tagaytay vegetables and fruits fetch very good prices and can be a good source of income. For mothers, this category- self-employed or engaged in small enterprise comprises a bigger percentage (18.48 percent) and involves selling products (usually produced by others) such as delicacies, fruits and vegetables, souvenir items and processed food and, as sales agents for inns, boats for lake tours. With regards education, majority of fathers have primary level schooling (46.39 percent) while majority of mothers have secondary level education (49.85 percent).

From this profile, we can say that the children in the sample is what is referred to in the literature as children 'at-risk of not developing their potential' due to a disadvantaged circumstance which is poverty (Engel et al., 2007; McGregor et al., 2007; and Walker et al., 2007).

Through the NGOs, children two to three years were able to access ECD program which may not have been possible otherwise. In the Philippines today, pre-primary education is compulsory and is made available for all children in this age group in the public schools. However, ECD program for the age group three years to five years is only available in the publicly and locally funded Day Care Centres with vertical classes (meaning all age group together in one class). Absent yet in the publicly provided programs and even in private

programs are organized ECD programs for two years old to three years old children. While Day Care Programs have provision for the three-year-olds to five-year-olds, it can provide only for a limited number of children since the law requires only at least 1 Day Care Centre for every barangay (village). A barangay's population range from 500-2000 families. Even if there are two sessions for the day care centre and 35 children per session, the maximum number of children that can be accommodated is only 70. Many children will not be able to access it in the current state of ECD provision. Certainly there are efforts to expand provision but it doesn't happen as desired yet. The private school ECD program is not an option for the poor in this study's sample.

Table 3.1
Profile of the Sample

PROFILE	CATEGORIES	BP SAMPLE		PAGASA SAMPLE		TOTAL SAMPLE	
		No	%	No	%	No	%
Sex	Girls	105	54.69	77	55.40	182	54.98
	Boys	87	45.31	62	44.60	149	45.02
	Total	192	100.00	139	100.00	331	100.00
Age	6 to 9	89	46.35	38	27.34	127	38.37
	10 to 12	67	34.90	55	39.57	122	36.86
	13 to 18	36	18.75	46	33.09	82	24.77
	Total	192	100.00	139	100.00	331	100.00
Family Size	2-3	3	1.56	5	3.60	8	2.42
	4-6	111	57.81	116	83.45	227	68.58
	7-9	68	35.42	14	10.07	82	24.77
	10 above	10	5.21	4	2.88	14	4.23
	Total	192	100.00	139	100.00	331	100.00
Income category	Absolute poor	119	61.98	96	69.06	215	64.95
	Poor 1	71	36.98	39	28.06	110	33.23
	Poor 2	2	1.04	4	2.88	6	1.81
	Total	192	100.00	139	100.00	331	100.00
Father's education	Primary	78	40.63	70	55.12	148	46.39
	Secondary	93	48.44	50	39.37	143	44.83
	Vocational	10	5.21	1	0.79	11	3.45
	College	11	5.73	6	4.72	17	5.33
	Total	192	100.00	127	100.00	319	100.00
Mother's education	Primary	79	41.15	34	25.56	113	34.77
	Secondary	79	41.15	83	62.41	162	49.85
	Vocational	2	1.04	2	1.50	4	1.23
	College	32	16.67	14	10.53	46	14.15
	Total	192	100.00	133	100.00	325	100.00
Father's job	Wage/Salary	164	85.42	110	80.29	274	83.28
	Self employment	18	9.38	25	18.25	43	13.07
	No income	10	5.21	2	1.46	12	3.65
	Total	192	100.00	137	100.00	329	100.00
Mother's job	Wage/Salary	75	39.06	60	43.48	135	40.91
	Self employment	26	13.54	35	25.36	61	18.48
	Housekeeper	91	47.40	43	31.16	134	40.61
	Total	192	100.00	138	100.00	330	100.00

Source: BP and Pagasa Data

After having discussed relevant points in the profile of the sample, we proceed to examine the relationship of our variable of interest which is Age at exposure to ECD and other variables such as sex, parent's education, parent's job and family income. This is best shown in Figures 3.1-3.7

Figure 3.1 shows the relationship of Age at exposure to ECD and Sex. We find that there are more girls than boys in each of the age group of exposure in the sample. We also see that girls tend to start to study earlier than boys. The ratio of girls to boys for example, is higher in the first three categories corresponding to earlier exposure to ECD than in the last category of age five years to six years corresponding to later exposure to the program.

Figure 3.1
Age at Exposure to ECD by Sex
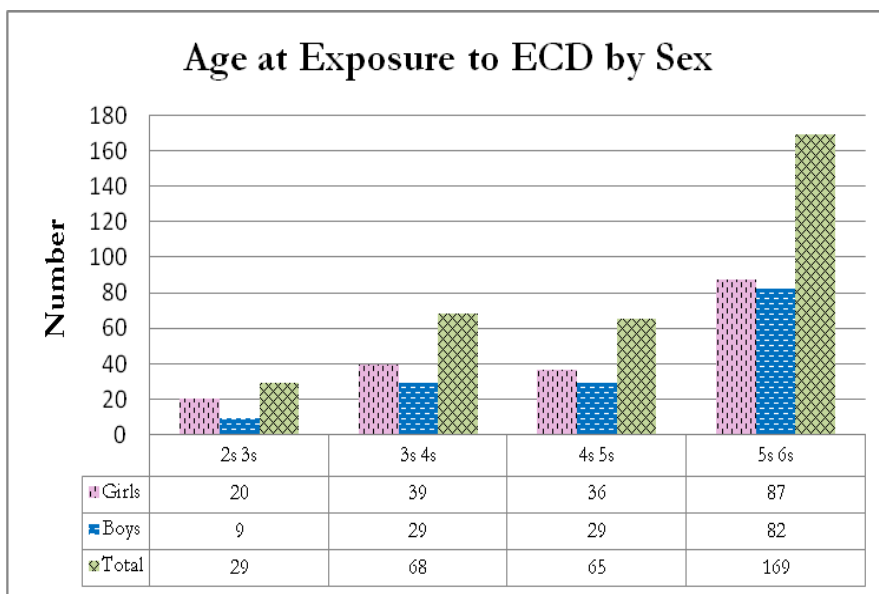
Source: BP and Pagasa Data

Figure 3.2 demonstrates the relationship between Age at Exposure to ECD and Mothers' Education. We find that among the four categories of age of exposure to the program, the category of two to three years have the highest percentage of their mothers with college/vocational level of education at 20.69 percent and the lowest percentage of their mothers with primary level of education at 24.14 percent. The difference though is not marked compared to the age five to six years group.

Figure 3.2
Relationship of Age at Exposure to ECD and Mothers' Education

Age of Exposure and Mothers' Education

	2s 3s	3s 4s	4s 5s	5s 6s
■ Primary	24.14	48.53	38.46	28.4
■ Secondary	55.17	33.82	49.23	55.03
⊠ Voc/College	20.69	17.65	12.31	16.57
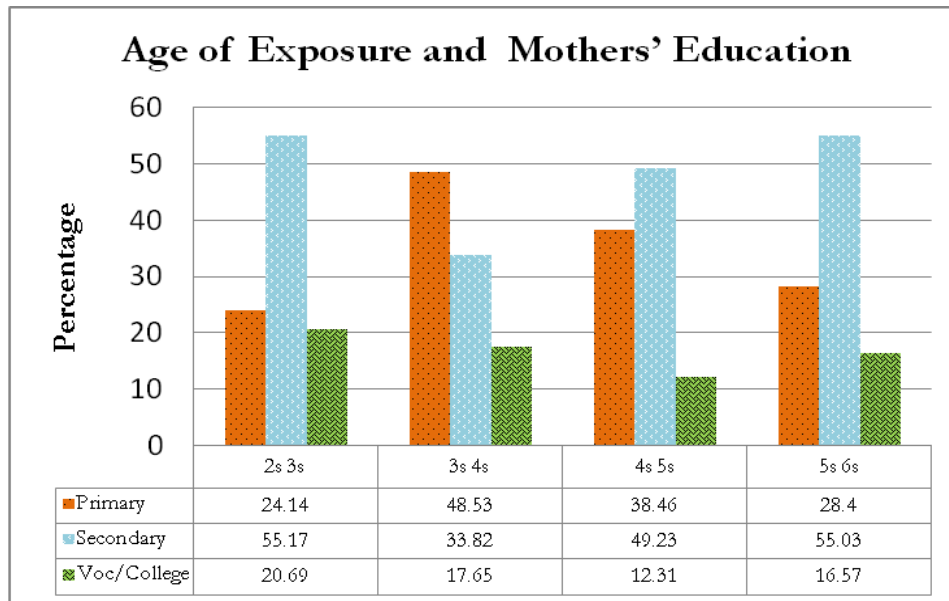
Source: BP and Pagasa Data

Figure 3.3 shows the relationship of Fathers' Education and Age at exposure. We find that fathers of children exposed to ecd at age two to three years have the highest percentage with college or vocational level of education (13.79 percent) and secondary level of education (51.72 percent) and the lowest percentage with primary level of education (34.48 percent) compared to the other age groups.

Figure 3.3
Relationship of Age at Exposure to ECD and Fathers' Education

Age of Exposure and Fathers' Education

	2s 3s	3s 4s	4s 5s	5s 6s
■ Primary	34,48	44,12	44,62	47,9
■ Secundary	51,72	44,12	46,15	44,91
⊠ Voc/College	13,79	11,76	9,23	7,19
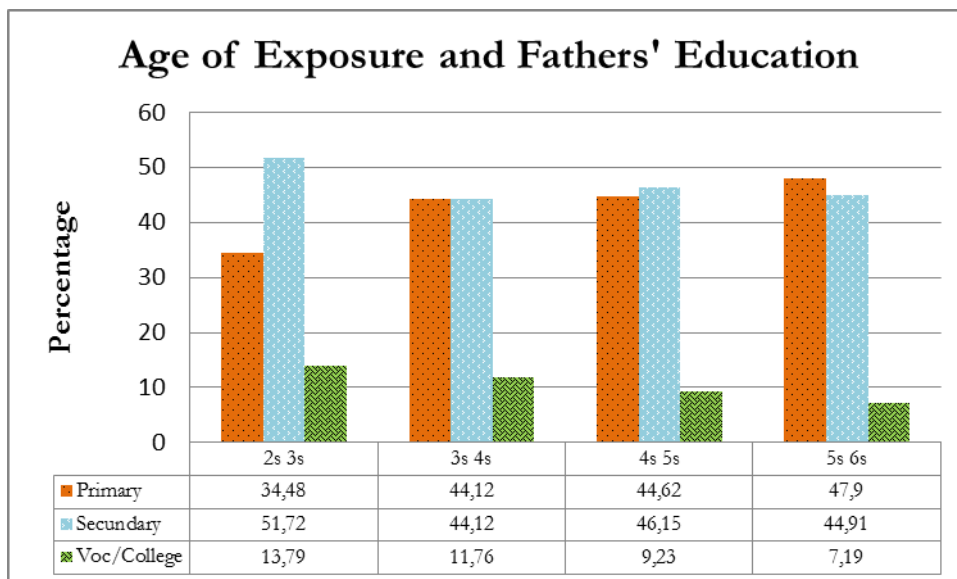
Source: Bukas Palad and Pagasa Data

Figure 3.4 shows that there are three categories for mothers' job: wage-based jobs, self-employment and unpaid jobs as housekeeper. The wage-based jobs comprise the greatest percentage in the age two to three years group while No Income (housekeeper) is shown in greatest percentage of the total of mothers in age four to five years.

Figure 3.4
Relationship of Age at Exposure to ECD and Mothers' Job

	2s 3s	3s 4s	4s 5s	5s 6s
Wage Earner	51.72	45.59	29.23	41.67
Self-Employed	10.34	11.76	16.92	23.21
No Income	37.93	42.65	53.85	35.12
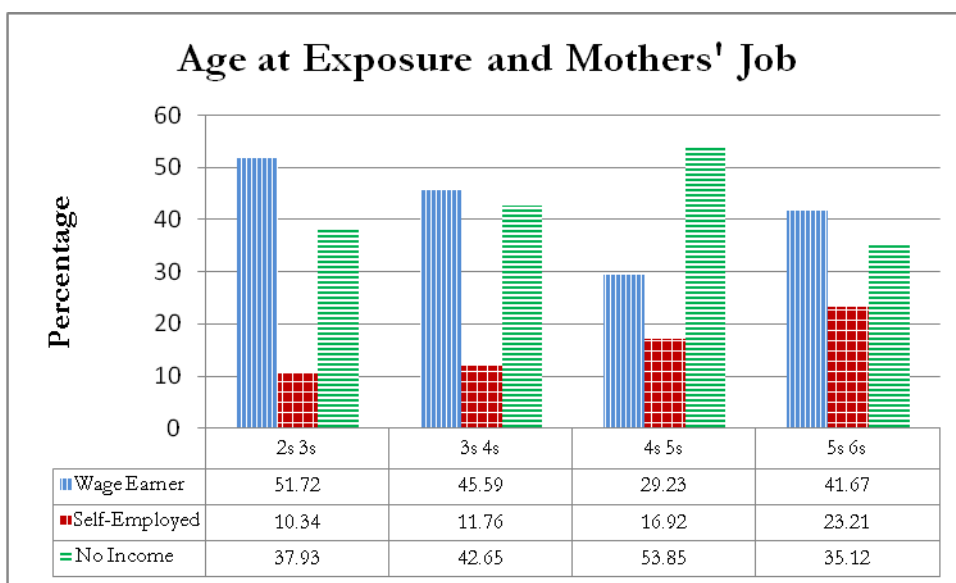
Source: Bukas Palad and Pagasa Data

In this figure 3.5, we see the relationship between fathers' job and age at exposure. Fathers' job has basically two categories: wage-based and self-employment. No income category refers to fathers who have no income due to infirmity and does not fit in any of the two groups above mentioned. We can see in the figure that almost all of the children's fathers work for wages. They make up 80 to 90 percent of the sample's fathers in the age two years to five years when exposed to ECD. Only the age five to six years at exposure has about 20 percent of fathers with self-employment.

Figure 3.5
Relationship of Age at Exposure to ECD and Fathers' Job

Age at Exposure and Fathers' Job

	2s 3s	3s 4s	4s 5s	5s 6s
Wage Earner	93.1	91.18	84.62	77.84
Self-Employed	6.9	4.41	7.69	19.76
No Income	0	4.41	7.69	2.4
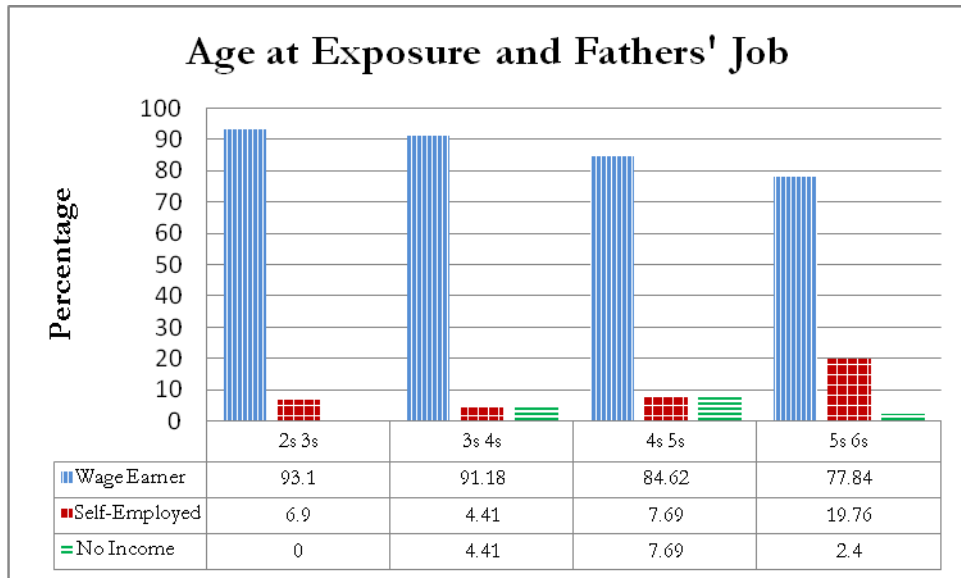
Source: Bukas Palad and Pagasa Data

How about the relationship of per capita income to the different age groups at exposure?

Figure 3.6 shows that although all children exposed to ECD are poor, children exposed to ECD at age two to three years came from families with relatively better capita income: 57.14 percent with two dollars a day per capita income as compared to 42.86 percent with one dollar a day per capita income. On the other hand, a greater percentage of families of children exposed to ECD at age three to six years have a dollar a day per capita income.

Figure 3.6
Age Exposed to ECD by Per Capita Income

	Absolute Poor	Poor 1	Poor 2
5s 6s	68.72	29.61	1.68
4s 5s	67.21	31.14	1.64
3s 4s	61.9	34.92	3.17
2s 3s	42.86	57.14	0,00

Source: Bukas Palad and Pagasa Data

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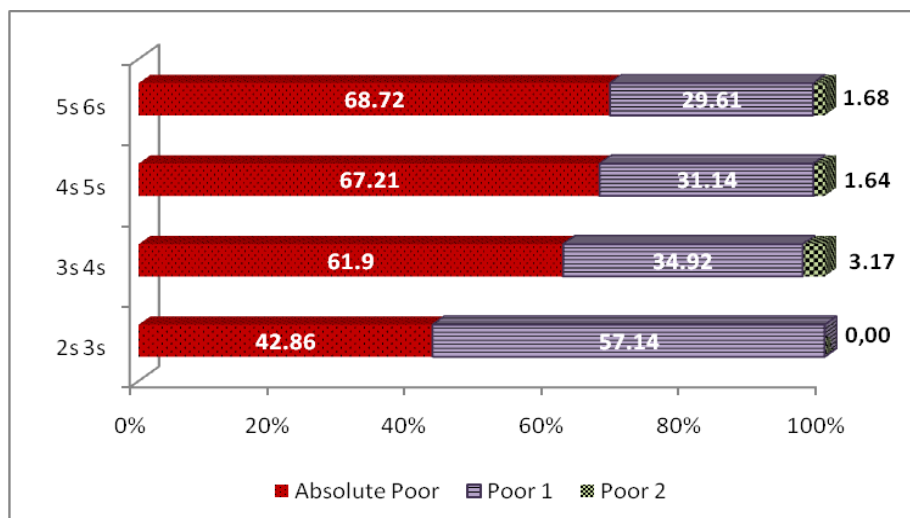
Chapter 4
Model Specification and Empirical Strategy

In this Chapter, we define the Empirical Strategy we will use to answer our research questions which are: Does age at exposure have a relationship to school performance? And, what are the other household characteristics that have importance to school performance? This study aims at showing the relationship between school performance, age at exposure to early childhood development program and other household characteristics. We use data from two NGOs in Tagaytay City whose ECD program possess characteristics interesting for investigation: targeted for the poor considered at-risk for loss of developmental potential in the literature (Engle et al., 2007; McGregor et al., 2007; and Walker et al., 2007); has an integrated approach to early childhood program provision and meet the national quality recommendation of important indicators discussed in chapter 3.

4.1 Model Specification

To examine the relationship between school performance and child age at exposure to early childhood development and other household characteristics, we use OLS Regression with two specifications. Although Model 1 is the preferred specification with mothers and fathers' variables, Model 2 with mothers' variables only, will also be shown for comparative purposes. Mothers as carers of children in some Asian countries, Philippines included, play an important role to human capital formation (Kamerman, 2002). We apply this model to examine the correlation of the different variables deemed important for school performance mentioned in section 4.2 with particular attention to the variable of interest which is age at exposure to early childhood development program.

If age at exposure is important to school performance, we expect to find a positive relationship between earlier age at exposure to early childhood development program and school performance. Likewise, we expect positive relationship between parents' education and school performance.

Model 1: Mothers and Fathers' variables (Preferred Model):

$$y = \beta_0 + \beta_1 A2s + \beta_2 A3s + \beta_3 A4s + \beta_4 NGO + \beta_5 AgeM + \beta_6 AgeF$$
$$+ \beta_7 SecEM + \beta_8 VCEM + \beta_9 SecEF + \beta_{10} VCEF + \beta_{11} SelfEmpM + \beta_{12} HM$$
$$+ \beta_{13} SelfEmpF + \beta_{14} NIF + \beta_{15} PCI + \beta_{16} Sex + \beta_{17} Age + \beta_{18} L7 + \beta_{19} L8$$
$$+ \beta_{20} L1 + \beta_{21} L2 + \beta_{22} L3 + \beta_{23} L4 + \beta_{24} L5 + \mu$$

In the notation, Y refers to school performance of children as proxied by the overall grade of academic performance or by specific subject Math and Language. The explanation for the independent variables is given as follows:

β's are the coefficients of the variables, while A2s, A3s, and A4s are dummy variables for age at exposure to ECD. A2s refers to ages two years to early three years old, A3s refers to ages late three years to early four years old and A4s refers to ages late four years to early five years old. The reference group is the group of children who were exposed to ECD when they were ages late five years to six years old.

NGO is a dummy variable for data coming from NGOs Bukas Palad and Pagasa. The reference NGO is Bukas Palad.

AgeM refers to mothers' age and AgeF refers to fathers' age.

SecEM and VCEM are dummy variables for mothers' education, the former referring to mothers with secondary education and the latter referring to mothers with vocational or college education. The reference point for this variable is mothers with primary education.

SecEF and VCEF are dummy variables for father's education, the former referring to fathers with secondary education and the latter referring to fathers with vocational or college education. Reference point is group of fathers with primary education.

SEM and HM are dummy variables referring to mothers' jobs. SelfEmpM refers to mothers who are self-employed or have small businesses while HM refers to mothers who are fulltime Housekeepers- mothers whose housework is unpaid and mothers who have no income. The reference point is the group of mothers with jobs paid by wages and salaries.

SEF and NIF are dummy variables referring to fathers' jobs. SelfEmpF refers to fathers who are self-employed or have small businesses while NIF refers to fathers who have no income. The reference point is the group of fathers who are wage or salary earners.

PCI refers to per capita income. Sex refers to the sex of the child and Reference for this is girls. Age refers to the age of the child.

L7, L8, L1, L2, L3, L4, and L5 are dummy variables referring to the level of schooling of the child. L7 and L8 refer to High School 1 and 2 which is level seven and eight respectively and L1-L5 refers to level one to five respectively. The reference point is L6 which is level six.

μ refers to the error term that includes unobserved factors that may have impact on schooling performance.

Model 2: With mother's variables only:

$$y = \beta_0 + \beta_1 A2s + \beta_2 A3s + \beta_3 A4s + \beta_4 NGO + \beta_5 AgeM + \beta_6 SecEM$$
$$+ \beta_7 VCEM + \beta_8 SelfEmpM + \beta_9 HM + \beta_{10} PCI + \beta_{11} Sex + \beta_{12} Age$$
$$+ \beta_{13} L7 + \beta_{14} L8 + \beta_{15} L1 + \beta_{16} L2 + \beta_{17} L3 + \beta_{18} L4 + \beta_{19} L5 + \mu$$

The only difference in this Model from Model 1 is the absence of the father's variables, so we keep all the other variables and their symbols as defined and described above in Model 1.

4.2 The Variables

As mentioned in the introduction, this paper will investigate through an existing early childhood development program in Tagaytay City, the relationship between age at exposure to early childhood development program, other household characteristics and school performance. This was motivated by research findings that the first six years of life of man marks the fastest period in human brain development but particularly the first three years and that good ECD program especially for at risk children (example: children in disadvantaged situation as in poverty) could have positive developmental outcomes (United Nations Children's Fund, 2001; and Consultative Group on Early Childhood Care and Education)

It is a consequence of the above that age at exposure to early childhood development program is the variable of interest to investigate school performance.

From the literature (Barnett, 2000; Leseman, 2002; and Powell, 2003), we find other variables that determine or have an effect on school performance such as child characteristics, parent characteristics, and family characteristics. These variables become our other controlled variables.

Our dependent variable, the school performance is measured by the school grade of a child's overall academic performance given in Table 5.1; school grade of a child in Mathematics, and school grade of a child in Language given in Table 5.2. The academic achievement of students is given in percent with the following scale: less than 75 percent as Fail; 75 percent as Pass; 76-79 percent as Needs Improvement; 80-85 percent as Fair; 86-90 percent as Satisfactory and 91-95 percent as Very Satisfactory and 96-100 percent as Outstanding. We find the use of school grades in the studies evaluated by Barnett (1995) and Gilliam and Zigler (2000).

Table 4.1 summarizes these variables:

Table 4.1
The Variables

Group	Variable	Description
Dependent Variable:	School Performance	Measured in terms of Overall Mean Grade, Math Grade, Language Grade
Independent variables:		
Variable of Interest:	Age at Exposure to ECD	Dummies with reference to age at exposure. Coded 1=2's 3's; 2=3's 4's; 3=4's 5'd; 4=5's 6's
Other Controlled variables:		
Child characteristics	Sex	Coded 0=Girl; 1=Boy
	Age	Continuous variable....

	Parents' age	Continuous variable...
Parents' character-istics	Parents' education	Coded 1=Primary; Secondary=2; Vocational and College=3
	Parents' job	Coded 1=Jobs with Salaries & Wages; 2=Jobs from Self-Employment or own Small Business; 3=Housekeepers and/or No Income
Family characteris-tics	Per capita income	Derived from Family Income/Family Size Coded 1=Absolute Poor if pci =$1/day or less; 2=Poor 1 if pci =$2/day or less; and 3=Poor 2 if pci =$3/day or less
	Family Size	Coded 1=2-3members; 2=4-6members; 3=7-9members; 4=10 & more members
Other Characteris-tics	NGO	Coded 0=BP; 1=Pagasa

Child characteristics are among those cited in the literature as having an effect on school performance. In our study, we have included two of these characteristics, sex and age.

NGO represented by BP and Pagasa where we got our sample is also included. While both of them have programs for support for education and health, the former provides ECD program to children from ages two years to six years old and the latter provides ECD program to children ages four years to six years old. This is understandable because the residences of the children in Pagasa are far from Pagasa ECD centre. Both NGO train from the same training institute and follow the same child-centred and developmentally appropriate practices in their ECD programs. Located in two different areas in the city, the two NGOs operate within their geographical area of location.

Parent's characteristics are also among those recognized in the literature (Powell 2003) to have an effect on schooling performance. We included both, mothers and fathers' age, education and jobs as variables. However, we expect that mothers' education is more important as determinant of school performance (Kamerman, 2002) and this is understandable. In the Philippines as in some Asian developing countries, mothers are still the main carers of children especially children below six years of age. Mothers then are seen to play a significant role in a child's nutrition, health and education. The understanding is, mothers with better education have children with better health, nutrition, education, and better schooling performance.

Family characteristics here include family size and per capita income but only per capita income was included as variable in the model. This is because per capita income was derived from family income and family size. The level of income or economic status' effect on school performance is linked to the problems attendant to being poor. Children from poor families face greater risks of not being able to attend primary education, or to finish primary education or to perform well in school due to health problems, malnutrition effects,

and economic related problems such that children may need to help earn for the family or lack of money to support school expenses. In this research, though all children in the sample come from poor families.

4.3 Econometric Concerns

Concern for potential sample selection bias in this study was raised which is a valid concern. However, although support for education and health program is targeted to children belonging to poor or indigent families in Tagaytay City, selection process is random based on two criteria: One, the family of the child has at least two years of residency within the geographical area of operation of the NGO. Two, the family is poor as evidenced by the dwelling, income, and job status of the parents. The two NGOs implemented these criteria to receive program participants. When the support for education and health program was launched in the 90's, there was more than enough support available for children in their geographical area of operation such that Pagasa even extended their area of operation.

Sample could suffer from non-random program exit. For example, sample in the sixth, seventh and eighth level could be the best left from their cohort who started when they were age three years old. While there is anecdotal report that children who were exposed to early childhood development program in general but specially at ages three years and below, have low drop out and repetition rate compared to those who were not exposed or exposed later at late five to six years of age, this has not been looked into in this study. There are empirical evidences that bear this fact of low drop out and grade repetition by children with ECD (Barnett 1995, and Gilliam and Zigler 2000).

Similarly, the number of observation in the estimated model of table 5.1 is reduced to 296 from our sample in the data equal to 331. This may lead to the concern for attrition bias in case there is systematic relation between missed observations and school performance. However, we have seen from the sample that the missed observations are not systematically concentrated to one specific level of exposure to early childhood development program or to a given range of school performance. Thus, missed observations are randomly distributed and attrition bias cannot be a real problem in this study.

Finally, our empirical approach may suffer from unobserved time variant and invariant factors, which may have relation to schooling performance and other controlled variables. In this case, the results may have potential bias due to endogeneity problem. Similarly, our cross sectional data analysis cannot show the overtime change in school performance in relation to different household specific characteristics. Despite this fact, the estimation result will help to get a general understanding about the correlation between child age at exposure to ECD and school performance in the study area.

Furthermore, this empirical study depends on simple ordinary least square estimation (OLS). Due to time and data problems we could not run alternative models such as fixed effect, instrumental variables to deal with different econometric concerns. This study hopes to be a basis for further study on this topic.

Chapter 5
Results

Applying the Model we have defined in Chapter 4 to examine the relation between household characteristics, our variable of interest 'age at exposure to ecd' and 'school performance' in terms of overall grade, we get the results presented in Table 5.1. We have also estimated alternative specification using Math grade and Language grade to measure school performance. The result obtained from this estimate is presented in Table 5.2.

From the preferred model result of our OLS regression in Table 5.1, we were able to know that four of the tested variables have impact on children's school performance, significant at 1 percent level. These variables are: age at exposure to ECD, mothers' education, fathers' education, and sex. Fathers' job showed significance at 5 percent level while Level 8 of school showed significance at 10 percent level.

From the three coefficients of the dummies of age at exposure to ECD, those exposed earliest at age two to early three years showed greatest school performance measured by overall grade or GA. For robustness check, we also estimated alternative model in Table 5.1. This model focused only on factors related to mother. These variables are supposed to have more impact on school performance of children than that of fathers' variables. The coefficient of the dummies in both models showed positive relationship to overall grade and has 3 percent more than the grade of the reference point and significant at 1percent. The children who participated in the ECD program at age three to six years, have, on average, (and controlling for the rest of the variables), lower overall grade or school performance than children exposed to ECD program at earlier age of two to early three years. This is consistent with our expectation. It is our expectation based on the cited Literature in Chapter 2 *why age at exposure may matter* and in Chapter 3 where we showed the characteristics of Bukas Palad ECD Program that meet quality indicators. We expected that in the presence of a good quality ECD Program, children exposed to ECD at the critical and sensitive age of three years and below, will have better developmental outcome in terms of school performance. We cited 2 empirical studies that observed greater effect sizes on developmental outcomes of children three years and below, from ECD participation. We also cited recent findings in developmental neuroscience on the fundamental plasticity of the brain and its susceptibility to influences of early experiences during the first three years and ECD help provide positive early experiences. Lastly, we cited Bronfenbrenner's bioecological model of development that gives importance to proximal processes and ECD is considered a proximal process.

The dummy for mothers with vocational or college education showed significance at one percent and has higher and positive school performance compared to those children whose mother have primary education only which is the reference point. The same result was obtained from the variable fathers' education. Children, whose fathers have vocational or college education, showed higher school performance than those whose fathers have primary ed-

ucation only. This is also consistent with the literature and empirical studies as it is expected that more educated parents will appreciate better the importance of early childhood development program for their children and take advantage of opportunities to provide it for them. However, the magnitude of the coefficient is greater in the variable fathers' education than that of the variable mothers' education. This could be due to the fact that there are fewer fathers who have college or vocational education compared to mothers and it could be that those fathers who have vocational or college education are really smart and have really smarter children compared to those fathers with primary education only.

Sex also showed importance to schooling in the results and significant at 1 percent level. The negative sign in the result for Sex, tells us that Boys have lower schooling performance compared to girls. Barnett (1995) found a relationship between schooling performance and sex. He writes: 'The most interesting hint with respect to variations in effects with child characteristics is the long-term effects on educational achievement and attainment might be greater for girls than for boys. The reason is unclear, but because boys from low-income families fare so poorly in the educational system (twice as many boys as girls are in special education), further research on this is warranted.' (Barnett 1995: 44).

Children whose fathers are either self-employed or who have small enterprises, have higher overall grade or schooling performance with respect to children whose fathers are wage and salary earners. Our results did not show significant relationship between mother's job and children's schooling performance. This could be due to the fact that fathers engaged in small business are engaged in backyard vegetable or fruit production (which gives good income in Tagaytay where fruit and vegetable are in constant demand) and are more present at home so interaction with their children more possible than parents who work for wages or salaries and goes home late and tired. Small enterprises engaged in by mothers are more related to vending or selling which takes them away from their homes during the day.

Mothers' age, fathers' age, child's age, NGO and per capita income seem to have no impact on schooling performance, looking at the results.

The level of schooling was found to have impact on school performance. Those children at the 8th level, have on average, better school performance than the other children in the reference grade of level 6. If the exit is not random, we said in chapter 4 that this cohort of children represented the best that survived from their group.

Table 5.1
The Effect of Age at Exposure to ECD and Household Characteristics on Children's Schooling Performance

VARIABLES	PREFERRED MODEL PARENTS VARIABLE MODEL (1)	MOTHERS VARIABLES ONLY MODEL (2)
A2s	3.573***	3.328***
	(0.672)	(0.695)
A3s	0.324	0.416
	(0.546)	(0.566)
A4s	0.692	0.539

	(0.503)	(0.519)
NGO	0.388	0.0886
	(0.521)	(0.530)
MOTHERS' AGE	0.0419	-0.00191
	(0.0327)	(0.0288)
FATHERS' AGE	-0.0270	
	(0.0235)	
M. EDU SECONDARY	0.188	0.419
	(0.393)	(0.396)
M.EDU VOC/COLLEGE	1.498***	2.026***
	(0.526)	(0.530)
F.EDU SECONDARY	0.520	
	(0.363)	
F.EDU VOC/COLLEGE	2.685***	
	(0.585)	
M.JOB SELF-EMPLOYD	-0.176	0.239
	(0.453)	(0.458)
M.JOB HOUSEKEEPER	0.0716	0.147
	(0.390)	(0.392)
F.JOB SELF-EMPLOYD	1.166**	
	(0.519)	
F. JOB NO INCOME	0.766	
	(0.956)	
PERCAPITA INCOME	0.00716	0.00729
	(0.0144)	(0.0146)
SEX	-1.078***	-1.181***
	(0.340)	(0.342)
AGE	-0.111	-0.110
	(0.237)	(0.236)
LEVEL 7	0.196	0.602
	(0.689)	(0.706)
LEVEL 8	1.472*	1.881**
	(0.840)	(0.856)
LEVEL 1	-0.840	-0.501
	(1.379)	(1.380)
LEVEL 2	0.222	0.693
	(1.183)	(1.188)
LEVEL 3	-0.176	0.258
	(0.970)	(0.963)
LEVEL 4	0.297	0.675
	(0.803)	(0.800)
LEVEL 5	-0.702	-0.275
	(0.695)	(0.712)
CONSTANT	80.42***	81.19***
	(3.039)	(3.009)
OBSERVATIONS	296	298
R-SQUARED	0.315	0.246

STANDARD ERRORS IN PARENTHESIS

*** p<0.01, ** p<0.05, * p<0.1

The results obtained for school performance using school grade in Math and Language as its measure as shown in Table 5.2, basically remained the same as those obtained using school grade on overall academic performance as the measure. The variables showing important relationship to school performance remained robust compared to the estimates in Table 5.1 Accordingly, age at exposure A2s or at age two to three years, education of fathers and mothers, sex and level of schooling are still significant.

Table 5.2
The Effect of Age at Exposure to ECD and Household Characteristics on Children's Schooling Performance (Language and Math)

VARIABLES	LANGUAGE		MATH	
	PREFERRED MODEL PARENTS VARIABLE	MOTHERS VARIABLES ONLY	PREFERRED MODEL PARENTS VARIABLE	MOTHERS VARIABLES ONLY
A2s	3.992***	3.734***	4.160***	3.843***
	(0.796)	(0.819)	(0.816)	(0.840)
A3s	0.180	0.323	0.173	0.316
	(0.643)	(0.662)	(0.659)	(0.678)
A4s	0.572	0.425	0.471	0.352
	(0.592)	(0.606)	(0.606)	(0.621)
NGO	0.445	0.155	-0.0345	-0.357
	(0.610)	(0.617)	(0.625)	(0.633)
MOTHERS' AGE	0.0601	0.0161	0.0600	0.0101
	(0.0386)	(0.0338)	(0.0396)	(0.0346)
FATHERS' AGE	-0.0288		-0.0349	
	(0.0276)		(0.0282)	
M. EDU SECONDARY	-0.00103	0.318	0.246	0.549
	(0.464)	(0.465)	(0.476)	(0.476)
M.EDU VOC/COLLEGE	1.199*	1.820***	1.843***	2.452***
	(0.615)	(0.616)	(0.630)	(0.632)
F.EDU SECONDARY	0.715*		0.650	
	(0.427)		(0.438)	
F.EDU VOC/COLLEGE	3.124***		3.132***	
	(0.685)		(0.702)	
M.JOB SELF-EMPLOYD	0.129	0.551	-0.190	0.210
	(0.531)	(0.533)	(0.544)	(0.547)
M.JOB HOUSEKEEPER	0.375	0.486	0.0491	0.0940
	(0.459)	(0.460)	(0.471)	(0.471)
F.JOB SELF-EMPLOYD	0.988		0.928	
	(0.607)		(0.623)	
F. JOB NO INCOME	0.456		1.312	
	(1.116)		(1.144)	
PERCAPITA INCOME	0.00992	0.0123	0.00995	0.0109
	(0.0168)	(0.0170)	(0.0172)	(0.0174)
SEX	-1.317***	-1.382***	-1.227***	-1.264***
	(0.400)	(0.400)	(0.410)	(0.410)
AGE	-0.171	-0.207	0.0502	-0.00245
	(0.278)	(0.275)	(0.285)	(0.282)
LEVEL 7	0.757	1.208	-0.323	0.205
	(0.812)	(0.826)	(0.832)	(0.846)
LEVEL 8	2.212**	2.729***	0.888	1.437
	(0.989)	(1.001)	(1.013)	(1.026)
LEVEL 1	-1.266	-1.088	0.0256	0.117
	(1.623)	(1.612)	(1.663)	(1.653)
LEVEL 2	-0.715	-0.359	0.789	1.106
	(1.390)	(1.387)	(1.424)	(1.421)
LEVEL 3	-0.675	-0.376	0.125	0.392
	(1.148)	(1.132)	(1.176)	(1.160)
LEVEL 4	-0.248	0.0810	0.339	0.619
	(0.955)	(0.944)	(0.979)	(0.968)
LEVEL 5	-0.922	-0.510	-0.849	-0.428
	(0.818)	(0.833)	(0.838)	(0.854)
CONSTANT	80.13***	81.21***	77.24***	78.54***
	(3.585)	(3.529)	(3.673)	(3.618)
OBSERVATIONS	292	294	292	294
R-SQUARED	0.299	0.235	0.297	0.232

STANDARD ERRORS IN PARENTHESIS

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

In general, based on alternative specifications and models used in Table 5.1 and Table 5.2, the most important factors which can affect the school performance of children are early age at exposure to early childhood development program, mothers and fathers' education, sex and higher level of grade. And, almost all findings are consistent with the expectations based on empirical evidence and theoretical arguments discussed in Chapter 2 and Chapter 3.

Chapter 6
Conclusion

Within the context of Tagaytay City Philippines, using the sample from the two NGOs, we examined whether in the presence of such an integrated early childhood development program of good quality as discussed in Chapter 3, children exposed to ECD at younger age of three years and below will have better school performance. We also looked at the relationship of other household characteristics to school performance.

We found that Mothers and Fathers' education positively affects school performance. Children of parents with vocational or college education have better school performance. This is in line with our expectation that parents having better educational background can also appreciate better the importance of education. They will therefore take advantage of opportunities for their children to secure better education outcomes. Sex affects school performance: girls were found to have better school performance than boys. Fathers' job also positively affects school performance of their children. Fathers who are self-employed or who engage in small enterprise have children whose school performance is better than children whose fathers work in jobs with salaries or wages. That controlling for child and parent's characteristics, NGO and per capita income, findings indicate that children exposed to ECD at age two years to early three years old have significantly higher school performance measured by math grade, language grade and overall academic grade than those exposed at age late three years to six years old.

Thus, this study suggests that it matters to start ECD at age below three years old. Higher school performance was found on children who were exposed to ECD at age three and below.

At least for BP and Pagasa, this result could be an added incentive to expand ECD services to more children aged three years and below. The findings from this study also provides empirical evidence to encourage and motivate children's parents to take advantage of ECD programs available at early age of two to three years and not only at five years of age. The prospect of children at succeeding in school is greater. .

The practice of starting exposure of children to ECD at age two to three years remains a challenge in the poor communities where the study was conducted. For one, letting young children of ages two to three years attend centre based ECD programs requires time and commitment from their parents especially mothers who are the primary carers. Time because these children need to be brought to the centre and be fetched after the two and a half hours session, five days a week. This is not much of a problem to parents whose houses are near or beside the ECD centre. But to those whose houses are kilometres away such as the case for many children from Pagasa, it seems an impossible endeavour. Commitment because other pressing concerns like household chores, possibility of earning income compete with the time required to bring the children to and to fetch the children from the ECD centre. Some tradeoffs are necessary and these affect the decision of parents.

Nevertheless, the above doesn't affect all parents. The sample profile showed a big percentage of mothers, 47.40 per cent in BP and 29.20 percent in Pagasa, who are full time housekeepers so planning their time well may allow them to bring their small children to ECD centres. From them, the demand for early childhood development program has still to gain more ground so that service providers especially from the private sector and NGOs, would be encouraged to fill the gap. The government is constrained and will provide compulsory pre-primary education as provided for by law, for all children ages five to six years of age and to some children ages three to five years that can be accommodated in the Day Care Centre in the barangay or village. At least in Tagaytay, if many young children starting from age two to three years living in areas far from ECD centres are in need of the program, alternative set ups of provision can be made. Playgroups in the area itself where the children live is an alternative model of provision that is available and is being practiced already in Pagasa (presently only done only in the centre). Even parents who have jobs can benefit from this alternative set up of provision.

But, since this program is not unique to BP and Pagasa in Tagaytay, there are also other Support for Education and Health Programs in other regions of the country such as Cebu, Manila, and Ilocos, it is hoped that this study becomes a basis for further research on this topic which may use data from these other programs and address the econometric concerns not addressed in this study hence will allow for generalization.

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