

*State-of-the-art report*  
**Child care arrangements:  
determinants and consequences**

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*State-of-the-art report*

# Child care arrangements: determinants and consequences

*Ylenia Brilli<sup>1</sup>, Daniela Del Boca<sup>2</sup> and Chiara Monfardini<sup>3</sup>*

*Abstract:*

This report summarizes the most recent empirical research on the effects of non-parental and household time investments on child development. The results from the studies considering non-parental child care policies are presented taking into account the timing of the intervention. The majority of large-scale policies providing non-parental child care have positive effects on children's cognitive outcomes, both in the short and in the medium run. Early childhood policies can have long lasting effects on adult outcomes, also boosting the development of noncognitive skills. The empirical results of the literature assessing the effects of time and income investments within the household show that while maternal time is crucial for child development, the father's and grandparents' time may also be important. There is already some evidence that the father's time can be a good substitute for maternal time, especially when the child grows up.

*Keywords:* child care, household investments, child development, review

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## **1. Introduction**

The importance of investing in early childhood education and care (ECEC) provision has been widely acknowledged by governments of advanced economies. High quality ECEC services may benefit children's development, boost educational attainments, encourage female labor market participation and contribute to children's well-being.. The increase in mother's participation to the labor market has been the most important change in households' time allocation during the last century, not only in U.S. but also in Europe (Bianchi, 2000). However, the impact of this change on children's well-being has produced mixed results. While the loss of maternal time may have a negative effect on children's well-being (e.g. socio-emotional and cognitive outcomes), it is also the case that the additional labor income has positive implications for expenditures on goods consumed by the child (Cooksey, Joshi & Verropoulou, 2009). On the other hand, paternal time has increased remarkably, partly offsetting the decline in mother's time. Moreover, parental inputs interact with other inputs such as the type of external child care used when the mother is at work. Hence, the impact of maternal employment on child development also depends on the substitutes of mothers' child care, namely external child care and paternal time.

The key literature on the role of early investments has been developed in the U.S. Todd and Wolpin (2003) and James Heckman and co-authors (e.g. Carneiro & Heckman, 2003) have modeled children's outcomes (cognitive, health and behavioral) as the result of a production function in which inputs are applied by families as well as by other people and institutions (schools, teachers, peers, society). In their framework, child development is considered the outcome of a cumulative process of knowledge acquisition, as in a firm production process. Heckman and co-authors show that these inputs play a very significant role, since cognitive and noncognitive outcomes are largely determined early in life. This research has consistently pointed to the fact that the foundations for learning are constructed in the earliest months and years of life and that the effort to give every child the best possible start needs to begin well before the years of formal education (UNICEF, 2007). Within the household, child development can be affected by family time and monetary inputs as well as formal child care.

As well discussed by Haveman and Wolfe (1995), investments in children's human capital depend on three main factors: the society or government that determines the opportunities available to both children and their parents (social investment); the choices made by the

parents regarding the family time and resources devoted to children (parental investment); the investments made by the children themselves once they reach adolescence. The distinction between societal and parental investment is particularly relevant for decisions concerning non-parental child care, where the choice of whether to use external forms of care remains up to parents, but the government can influence this choice by changing the opportunities available to them and the quality of the service they can buy.

In Europe, only more recently has attention been drawn to the impact of parental and public investments on child outcomes. European governments are more involved in the provision and regulation of child care services, and the supply from the private sector is more limited than in the U.S.

The Familyplatform project funded by the EU's 7<sup>th</sup> FP (2009-2011) emphasized the existing heterogeneity in quantity and quality of child care provision across European states. Discrepancies are observed despite the recent expansion of care systems all over the EU in accordance with the 2002 Barcelona European Council goals of "providing childcare to at least 33% of children under 3 years of age and to at least 90% of children between 3 years old and the mandatory school age in each EU member state by 2010" (Uhlendorff, Rupp & Euteneur, 2011, p. 77; European Union, 2002). The differences in the institutional contexts and in the features of the child care systems may have implications not only for parents' choice to use some forms of care instead of others, but also for the effects of these choices on subsequent child development.

In this report, we review the state-of-the-art knowledge concerning the effects of external child care and household investments on child development, taking into account different data, methodologies and institutional contexts. In the first part of the report we will refer to formal versus informal arrangements. By formal arrangements we mean center-based and school-based forms of child care or preschool, while the informal ones refer to other types of child care such as babysitter, relatives or friends, which are less institutionalized. Usually, the forms of care provided to children aged between 0 and 2 years of age are called non-parental child care, while the forms of care for children aged between 3 years and the mandatory school age belong to the category of preschool or pre-primary child care arrangements.

In the first part of the report, we provide a brief overview of child care availability and use in

several OECD countries and we summarize the empirical findings from the literature evaluating the impacts of external child care. We devote particular attention to studies assessing child care impacts on different subgroups: by gender, migrant status, socio-economic conditions or disability. In doing so, we describe important research gaps we intend to fill within Work Package 6 of the Families and Society project. These include the study of the effectiveness of the type of public intervention (cash or in-kind) in the provision of child care, the analysis of child care impacts in Northern and Southern European countries, the implications of child care policies for migrant and disabled children and the analysis of the determinants of children's development within the capability approach, which takes into account the multidimensional aspect of well-being.

In the second part of the review we present the empirical results of the literature assessing the effects of time and income investments within the household on child development, taking into account the specificity of non-intact households and changes in family structure. We describe our future research contribution to various aspects identified by the Familyplatform project (Uhlendorff, Rupp & Euteneur, 2011, Section 1.8), such as the role of investments made by fathers and grandparents and that of the investment decisions made by children themselves. We also plan to tackle the issue of the multiple dimension of child's development and well-being, considering both objective and subjective measures of well-being whenever available from survey data.

## **2. External child care**

### **2.1 Overview of external child care arrangements in OECD countries**

As discussed in the recent literature, the type of external child care available is very important since it represents a substitute for mother's child care time. Since the late 1980s there have been several studies estimating the effect of external child care on child development in the U.S. In recent decades, there have been increasing numbers of birth cohort studies in other countries that allow exploration of this issue, such as the Millennium Cohort Study (in the U.K.), the Longitudinal Study of Australian Children and the French Longitudinal Study of Children (ELFE).

The results from existing studies on child care impacts are not univocal; their variability may depend on differences in the input considered, in the data sources and the methodology used, and in the institutional contexts.

Formal child care has been one of the most crucial areas of family policy reform in the EU, particularly in the light of the objectives set by the Barcelona European Council 2002 to provide child care to at least 33 percent of children under three years of age and to at least 90 percent of children between three years old and the mandatory school age by 2010 (European Union, 2002). Child care provisions in the EU differ substantially with regard to coverage rates, affordability and quality.

While the incentives and objectives for developing ECEC provision are similar across Europe, the approaches taken and the organizational structures of national ECEC systems differ considerably: some countries in Northern Europe have moved to fully integrated systems providing early childhood education and care for all age groups of preschool children, often also featuring integrated approaches to school education and after school care, while countries in Continental and Southern Europe are developing provision within a system that differentiates between early education and pre-school. In some countries, ECEC is predominantly public (for instance, Finland or Denmark), whereas in others, such as U.K. but also Italy, the development of private child care has been encouraged. Structure and levels of financing, curricular orientations and staff qualifications also differ between countries (Bennet, 2008).

The use of formal child care arrangements increases with the age of children, while child care services for children under three are particularly well-developed and widespread in the Northern European countries. As shown in Figure 1, enrollment in formal (public and private) preschool is over 60 percent in almost all EU countries, but enrollment in child care for ages 0-3 is much lower and heterogeneous across countries. In Denmark, The Netherlands and Sweden, the majority of children younger than 3 attend a formal facility, while in other countries (e.g., Spain, Italy and also in the U.S.) less than 30% attend. It can be seen in Figures 1 and 2 that in countries of lower use (such as Italy, Germany, Greece and Spain), children more often rely on the care provided by their parents or by other informal services. In countries such as Denmark and Sweden, the use of other types of child care arrangements (mostly informal, such as nannies or baby sitters) is instead negligible.

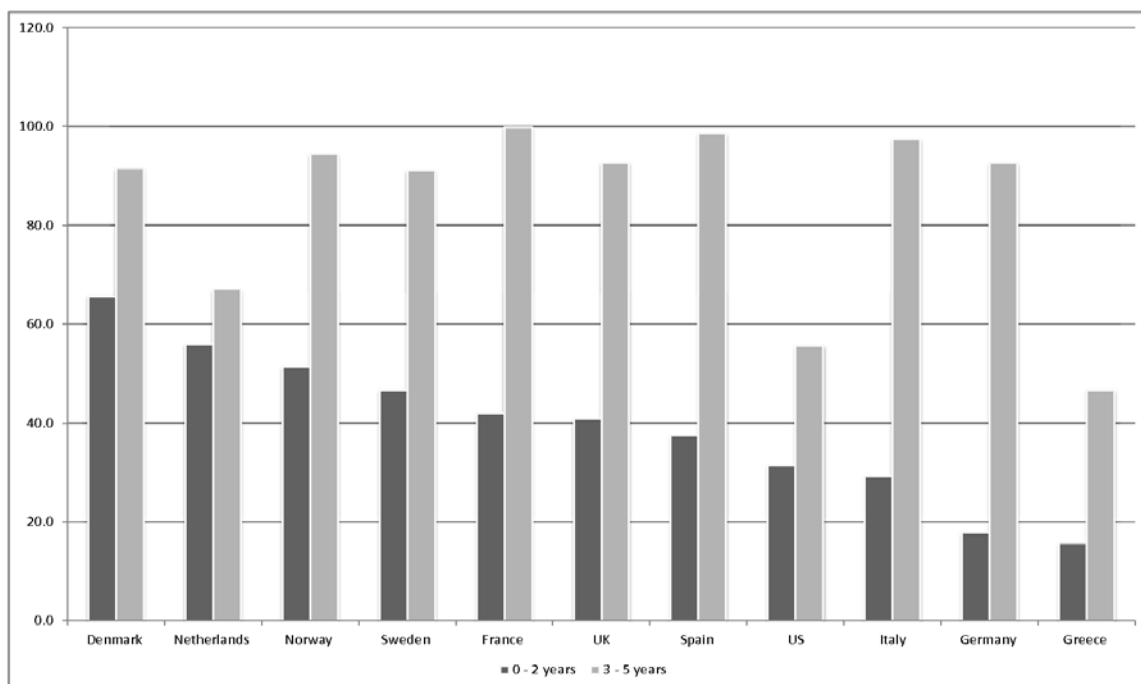
The structure and characteristics of the child care systems differ significantly across these countries. In the U.S. and the U.K., the private sector accounts for a large share of the child care market, with the government intervention taking the form of subsidies and tax allowances to assist poor households with child care expenditures. In these countries, the service is primarily private, and childcare centers are traditionally higher quality than informal forms of care, such as that provided by grandparents, nannies and baby sitters. In several European countries though governments are directly involved in the regulation of child care services, their engagement in child care provision is not widespread; moreover, the supply from the private sector is very limited. Countries in Northern Europe - such as Sweden, Denmark and Norway - are characterized by universal public child care services, while countries in Southern Europe - such as Italy - are moving toward a mixed childcare supply involving both the private and the public sectors, with all providers subject to regulation in order to respect minimum quality standards. Similarly, in Spain child care for children aged 0-2 is rather scarce compared to preschool availability for children aged 3-5. In Germany, even today, there are striking differences between West and East: in West Germany, only recently have policies been implemented to increase child care availability for children aged 0-2; on the contrary, East Germany has traditionally invested in child care, so that child care for children under 3 has always been more common.

Another crucial aspect of child care provision is the quality of the service. Regarding staff-child ratio, there are again considerable differences throughout Europe: for children under three, in Denmark and the U.K. the staff-child ratio is (1:3), while elsewhere, such as in Italy and Germany, it is (1: 6 - 1:10). There are also differences in the educational level of child minders and preschool teachers. Staff qualifications also tend to vary between public and private child care institutions, with the private child minder usually being less educated (Jokinen & Kuronen, 2011).

Both the quantity and the quality of child care are related to levels of government spending for child care for 0-2 aged children and pre-primary for children aged between 3 years and the mandatory school age. According to Figure 3, Northern-European countries invest much more than Southern European countries for pre-primary education.

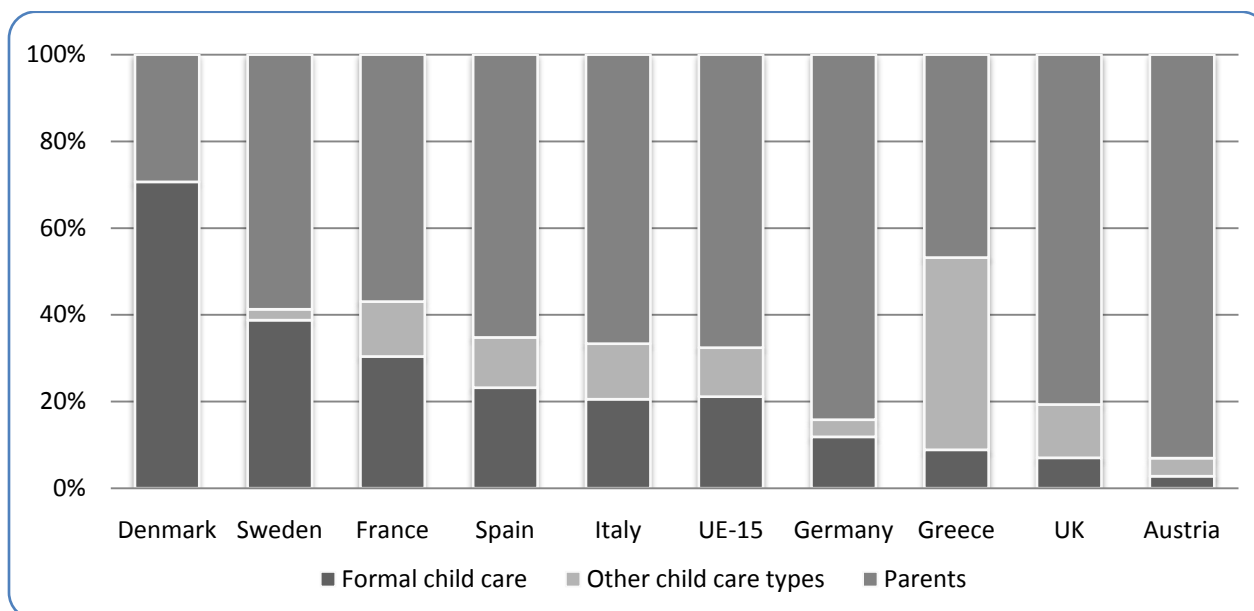


Figure 1. Enrollment rates of children under age 6 in formal care or early education services, 2008.



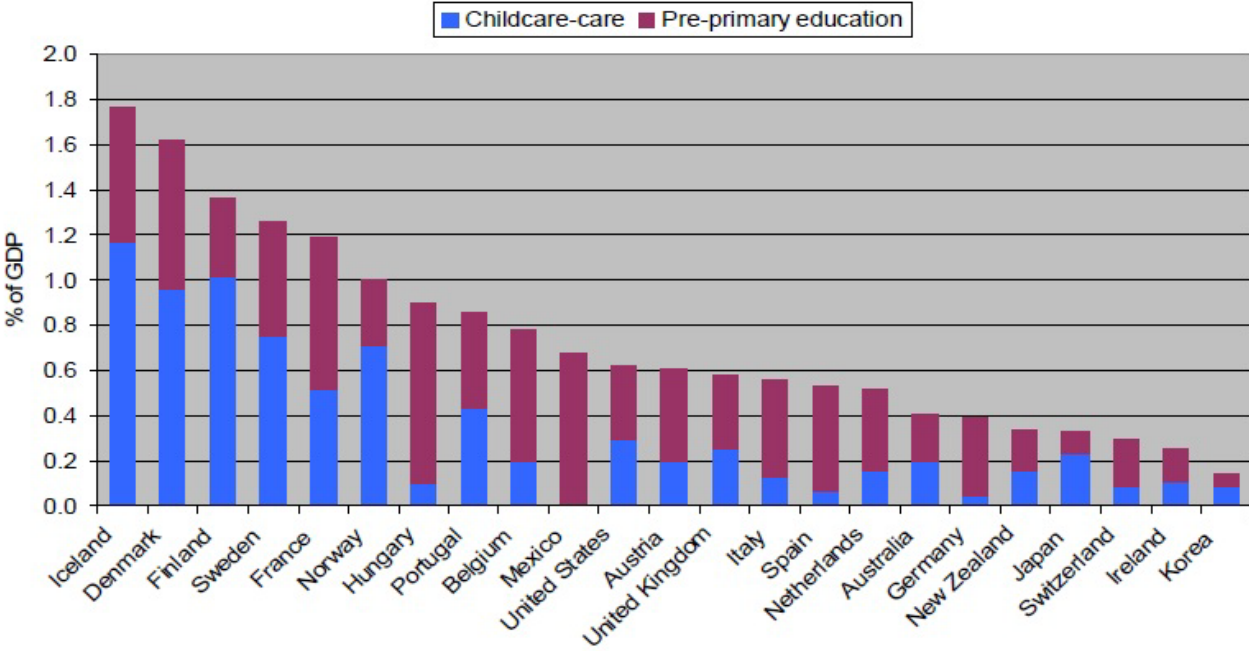
Source: OECD Education database. Formal care and early education services include both public and private facilities.

Figure 2. Child care arrangements used for more than 30 hours per week, 2008.



Source: Eurostat.

Figure 3. Spending for child care and pre-primary education as a percentage of GDP.



Source: OECD Family Database 2010.

**2.2 The determinants of child care demand**

The use of formal child care is the outcome of both parental attitudes toward external child care and the availability of formal services. In countries where the availability of formal child care or the cash support to families increases, its use also increases. For instance, in the U.K., when the government introduced a range of different forms of financial support towards the cost of formal center-based provision for children aged 3-5, the number of children in formal services almost doubled from 1.14 million to 2.15 million between 1999 and 2008. Among all children with working parents, the percentage in formal child care rose from 24 percent in 1999 to 42 percent in 2008 (Bryson, Brewer, Sibieta & Butt, 2013). In Italy, public child care availability is very different across regions, ranging between values close to 0 in some areas in the South to more than 20 percent in some areas of the North. Zollino (2008) shows that there is a positive correlation between child care availability and child care demand, where the demand of the service is defined as the length of the waiting list; this means that in regions where child care availability is higher, the number of applications increases.

This result is consistent with the literature studying the implications of either cash or in-kind services. Cash services imply government intervention in the subsidization of the service, but do not affect the characteristics of the services available to parents; usually, in countries

where government intervenes through subsidies (such as U.S. and U.K) the private non-parental child care market is more widespread. In-kind services, instead, imply that governments intervene directly in the regulation or the provision of the service and are often “rationed” (Italy, Spain, Germany). Several studies argue that government intervention in child care regulation or the subsidization of the service is justified on the grounds of both equity and efficiency (Blau & Currie, 2006; Carneiro & Heckman, 2003). For instance, Baker, Gruber and Milligan (2008) show that a policy subsidizing formal child care implemented in Quebec (Canada) during the late 1990s had a positive and significant impact on child care use and on the probability to use the subsidized formal service instead of the informal one. Similar results emerge for Italy (Del Boca and Vuri, 2007).

In countries where the availability of non-parental care services is limited or rationed (such as Italy, Greece and Spain), choosing whether to use formal services may also depend on other characteristics of the service, i.e., not only the cost, but also opening hours. In the U.K., despite a variety of initiatives aimed at improving formal child care availability, the number of children in informal child care (grandparents and babysitters) rose, mainly due to potential shortcomings in the formal child care available to parents (e.g., cost, affordability, availability, opening time, etc.) or to the part-time nature of early services. Del Boca and Vuri (2007) report similar figures for Italy, where public child care has limited opening hours and its cost depends on household income.

However, the choice to use formal child care also depends on parents' preferences and cultural attitudes. In Southern Europe especially, a large number of parents are still reluctant to use formal child care for younger children, preferring the care of grandparents. Chiuri (2000) finds a negative and significant effect of having a relative living in the household on the choice to use formal child care. This may be due to family preferences for values and gender roles: in Southern European countries, where the traditional role of mother is still highly valued, mothers are considered the best caregivers for their children. If the mother works, grandparents, and especially grandmothers, are trusted more (Del Boca, Locatelli & Vuri, 2005). Recent studies analyze child care choices using a new approach based on trust (both toward people and institutions) and on how much parents recognize child care as an early childhood investment for the development of the social and academic skills of children. El-Attar (2007) studies the role of trust toward other people in child care choices, assuming that child care options differ in their degree of ‘externalness’, ranging from mother to grandparent

care, up to babysitter care and kindergarten. Considering Southern European countries, she finds that trust has a positive effect on the choice to use more external child care options.

### **2.3. Empirical findings on external child care and child development**

The impacts of external child care on child development have recently been analyzed from the point of view of different disciplines. In the psychological literature, empirical findings indicate that the effect of child care on children's outcomes is small, but consistent (Burchinal, Kainz & Cai, 2011; Sosinsky & Kim, 2013) and high quality child care is positively associated to children's cognitive, linguistic and socio-emotional outcomes (Burchinal, Peisner-Feinberg, Bryant & Clifford, 2000; Duncan, 2003; NICHD, 2006).

The economic literature provides very heterogeneous results. Some studies analyzing the U.S. case (Bernal & Keane 2010, 2011) reported a negative effect of having attended (any) child care before kindergarten. Other studies found positive results. For instance, Loeb, Bridges, Bassok, Fuller and Rumberger (2007) found that reading scores of children who attended a center-based arrangement were 1.2 points higher than those of children cared for by their parents, and their math scores were 2 points higher. Currie and Thomas (1995, 1999) and Deming (2009) evaluated the effect of having attended Head Start by comparing siblings who attended the program with those who did not and find positive differences in test scores. The reasons for these different findings depend on the different child's outcome measure, the diverse data source considered, the different empirical strategy for estimating the parameter of interest and the characteristics of child care. Only very recently have external impacts on child development been studied in Europe. Many of these studies focus more on publicly provided child care, and most of them suggest positive implications for child development, especially for children from disadvantaged backgrounds.

In this section, we will review the results from selected studies evaluating the impacts of child care on child development. The following subsections present the results according to the child's age at which the outcomes are measured. Early child outcomes encompass several measures of child's ability assessed immediately after the child care inputs have been received, up to the time when the child is enrolled in grade 1 of primary school. Middle childhood and adolescence outcomes include those measured when the child is in the age-range 7-16. Adult outcomes refer to labor market experience, final education or wage.

Of course, these measures are not exhaustive indicators of children's well-being. The EU Task-Force on Child Poverty and Child Well-Being (2008) report suggests seven dimensions of child well-being divided in two broad groups. The first covers factors that relate to the material resources of the household that the child has access to (or lacks) during his/her development. These include indicators of income, material deprivation, housing and the labor-market attachment of members of the household. The second group covers non-material dimensions of child well-being, which may reflect both the resources a child has access to (or lacks) during his/her development and outcomes at different stages in that development (most notably education, health, exposure to risk and risk behavior, social participation and relationships, family environment and the quality of the local environment). Moreover, the well-being of children and their families are clearly interrelated. Parental investment in children (in terms of time but also economic resources) depends on the socio-economic condition of the household. This section only reviews studies assessing the relationship between child care policies and children's cognitive and noncognitive outcomes and outcomes in adult life. However, child care policies may also have an impact on the overall family and the relationship between parents and children. Even though the literature analyzing this relationship is more limited, there is some evidence that child care policies subsidizing external child care use may be detrimental for parent-child interactions and for parents' health. For instance, Baker et al. (2008) estimate the effects of the Quebec Family Policy providing formal child care on several outcomes: some of their findings are that the policy has detrimental effects on the relationship between parents and children; moreover, the policy negatively affects father's health and has been found to increase mother's depression. However, there are also examples of good practice and of early childhood intervention in Europe delivered in ways that are sensitive to the needs of children and families experiencing poverty (see, for instance, the projects implemented in Belgium and Spain reported in EAPN & Eurochild, 2013, p. 26). These successful projects confirm that "universal early childhood, health, education and housing services need to be developed and delivered in ways which make them easy to access, non-bureaucratic, flexible, respectful of their clients' different cultural, social and religious backgrounds, and able to tap into a wider network of family and services" (EAPN & Eurochild, 2013, p. 26).

### ***2.3.1. External child care and early childhood outcomes***

Selected studies evaluating the impacts of child care provided by people external to the household are summarized in Table 1. The outcomes are measured immediately after the implementation of the inputs (i.e., external child care policy): the outcomes considered encompass readiness and vocabulary test scores as well as other behavioral indices measured at kindergarten or primary school. Measuring these effects is important, since it allows testing of whether child care or preschool are effective in preparing the child for subsequent experience at school. However, it is not clear which type of service could have more of an influence on cognitive and noncognitive measures in the short-run. For instance, Hansen and Hawkes (2009) test the effectiveness of four child care categories (formal group, formal non-group, partner care and other informal care) on a vocabulary test and a school-readiness test, as well as on a noncognitive score, measuring the presence of behavioral problems. They find that formal group arrangements are more effective than other categories for the school readiness score and the child's behavioral problems, but have a detrimental effect on the child's vocabulary.

Berlinski, Galiani and Gertler (2009) assess the effect of a program providing free and universal access to preschool in Argentina and find positive and significant impacts on Math and Spanish test scores, as well as on behavioral outcomes (i.e., attention and effort in the class).

More recent studies focus on European countries. Felfe and Lalive (2012) estimate the impact of having attended child care between 0 and 2 years of age in West Germany. In order to reduce the impact of the correlation between the choice of using external child care and parents' and children's unobservables, they use within-state differences in child care supply as an instrument for child care attendance. They find that children with low birth weight and with younger and less educated mothers benefit more from child care. On average, having attended child care has positive effects on both language and social skills.

In Europe, there have been also examples of preschool programs evaluations, such as the one conducted in UK on the EPPE programs. The Effective Provision of Pre-School Education (EPPE) project is the first major European longitudinal study of a national sample of young children's development between the ages of 3 and 7 years. To investigate the effects of pre-

school education, the EPPE team collected a wide range of information on 3,000 children. The study also looks at background characteristics related to parents, the child's home environment and the pre-school settings children attended. Sylva, Melhuish, Sammons, Siraj-Blatchford and Taggart (2003) provide evidence of a positive effect of high-quality preschool on social/behavioral development over the preschool period, while Sylva, Melhuish, Sammons, Siraj-Blatchford and Taggart (2004) show that high-quality pre-school provision may have positive effects on children's intellectual and social behavioural development up to the end of Key Stage 1 in primary school. Their research indicates that pre-school can play an important part in reducing social exclusion and promoting inclusion by offering disadvantaged children, in particular, a better start to primary school. Melhuish et al. (2008) evaluate the effect of the same project on Math test scores measured at age 10, finding higher benefits from high-quality pre-schools and for the most disadvantaged children. Further results on the effects of child care policies for disadvantaged children will be reported in section 2.4.

Finally, two studies refer to a public programs aimed at offering universal pre-kindergarten in Oklahoma (U.S.). Differently from most other U.S. studies, they consider a public preschool policy. Both Gormley and Gayer (2005) and Gormley (2008) evaluate the Tulsa Pre-Kindergarten program, started in 1998, using a Regression Discontinuity approach and exploiting the age cutoff for children to be enrolled in the program. Gormley and Gayer (2005) find that having attended high-quality preschool increases children's cognitive, language and motor skills scores. Gormley (2008) evaluates the same policy five years later only on Hispanic children and finds positive and statistically significant effects on both the Letter Word (LW) and the Applied Problem (AP) test scores.

*Table 1. Selected studies evaluating the effects of external child care provider's investments on children's development during early childhood.*

<b>Study</b>	<b>Country</b>	<b>Data</b>	<b>Estimation Method</b>	<b>Results</b>
Felfe and Lalive (2012)	West Germany	German Socio-Economic Panel	Marginal Treatment Effect and IV. Instrument: within county variation in child care availability	Effect of having attended child care when 0-2 on language and social skills +.
Berlinksi, Galiani and Gertler (2009)	Argentina	Operativo Nacional de Evaluacion Educativa	OLS with municipality, province and year Fixed Effects	Effect of one more place at pre-primary school on Math and Spanish scores +
Gormley and Gayer (2005)	Oklahoma (US)	Tulsa Public School	Regression Discontinuity	Effect of having attended the Tulsa pre-kindergarten program + on both Language and Cognitive score
Gormley (2008)	Oklahoma (US)	Tulsa Public School	Regression Discontinuity	Effect of having attended the Tulsa pre-kindergarten program + on Letter Word, Applied Problems and Spelling test scores



*Table 2. Selected studies evaluating the effects of external child care provider's investments on children's development during mid-childhood and adolescence.*

<b>Study</b>	<b>Country</b>	<b>Data</b>	<b>Estimation Method</b>	<b>Results</b>
Datta Gupta and Simonsen (2010)	Denmark	Danish Longitudinal Survey of Children; Danish Administrative Registers;	OLS and IV. Instrument: dummy for living in a municipality providing universal access to preschool	Effect of preschool (vs. family day care) + on language test score at 11
Datta Gupta and Simonsen (2012)	Denmark	Danish Longitudinal Survey of Children; Danish Administrative Registers.	OLS and IV. Instrument: dummy for living in a municipality providing universal access to preschool	Effect of family day care (vs. home care) on behavioral outcomes at 7 -. Effect of preschool (vs. family day care) + on behavioral outcomes at 7
Dumas and Lefranc (2010)	France	French Ministry of Education Panel (DEPP) & Education Training and Occupation Survey	OLS with school/birth department Fixed Effects	Effect of age of entry at pre-primary school (2 instead of 3) + on number of repetition at 11 and 16 and + on the probability of graduating. Effect of preschool duration (2-3 years instead of 1) – on number of repetitions at 11 and 16.
Berlinksi, Galiani and Manacorda (2008)	Uruguay	Encuesta Continua de Hogares	Mother Fixed Effects	Effect of having attended at least 1 year of preschool on the probability to attend school at the time of the interview +
Goodman and Sianesi (2005)	UK	National Child Development Study	OLS	Effect of pre-compulsory education and preschool + on cognitive development index at 11 and 16
Felfe, Nollenberger and Rodriguez-Planas (2012)	Spain	Program for International Students Assessments (PISA)	Diff-in-Diff	Effect of the reform increasing child care availability for 3-years old children on Math and Reading scores +

### **2.3.2. External child care and mid-childhood outcomes**

Several studies have evaluated the impacts of child care attendance on medium-term outcomes, measured when children are between 7 and 11 years of age. The majority of them consider cognitive attainments, assessed at school, but there are also examples of noncognitive outcomes, such as scores and indexes based on the factorization of several variables providing information about the acquisition of diverse skills. Table 2 summarizes the main results from these studies.

For Latin America, Berlinski, Galiani and Manacorda (2008) estimate the effect of a preschool expansion policy on current school attendance and years of completed education, reporting that children affected by the reform were more likely to attend school and to have more years of education.

Datta Gupta and Simonsen (2010, 2012) evaluate the effects of the high-quality child care in Denmark using the SDQ index measuring children's behavior as outcome. They distinguish between municipal-regulated preschool, less regulated family day-care services and child care provided by parents. They find that having attended preschool has a more positive effect on children's behavior than family day care arrangements; indeed, they do not find any effect on noncognitive outcomes measured at 11 years of age (such as the SDQ index, the likelihood of drinking or smoking, etc.), while preschool attendance seems to improve children's attitudes and feelings toward school. Felfe, Nollenberger and Rodriguez-Planas (2012) evaluate the effects of a policy (implemented in late 90s) introducing universal child care for 3-years old children in Spain on their cognitive outcomes at 15, exploiting data from the 2003, 2006 and 2009 PISA assessments. They use a Diff-in-Diff approach and estimate a sizable increase in reading and math test scores following the reform. The authors argue that these estimates represent the effect of crowding out the mother's or grandmother's care in favor of formal child care, since in Spain and Mediterranean countries in general, private child care was not widespread at the time of the reform.

Table 3. Selected studies evaluating the effects of external child care use on adult outcomes.

Study	Country	Data	Estimation Method	Results
Havnes and Mogstad (2011)	Norway	Statistics Norway	Diff-in-Diff	Effect of the reform increasing preschool availability on years of education and probability to attend college +. Effect of the reform on drop out -
Havnes and Mogstad (2010)	Norway	Statistics Norway	Non Linear Diff-in-Diff	Effect of a reform increasing preschool availability on the earnings distribution: + below the 70 <sup>th</sup> percentile, - beyond the 80 <sup>th</sup> percentile
Dumas and Lefranc (2010)	France	Education, Training and Occupation survey	OLS with school/birth-department Fixed Effects	Effect of staying in preschool 2 years or 3 years (vs. 1 year) on monthly wage +
Akabayashi and Tanaka (2012)	Japan	School Basic Survey & Survey of Social Service facilities	OLS and IV (GMM). Instrument: number of religious institutions and lagged nursery and school availability	Effect of a policy implemented during the 60s increasing nursery and school availability on high school enrollment and college attendance +
Goodman and Sianesi (2005)	U.K.	National Child Development Study	OLS	Effect of preschool on wages +

### 2.3.3. Long-term outcomes

Recently, there have been several studies assessing the long-run effects of child care policies implemented during the 1960s and 1970s. They are summarized in Table 3.

Akabayashi and Tanaka (2013) provide evidence from a preschool expansion policy implemented in Japan during the 1960s. They find that the policy increased not only high school attendance rates but also college advancement rates. Dumas and Lefranc (2010) report the effects of preschool duration in France on monthly wages, while Goodman and Sianesi (2005) estimate the impact of having attended preschool in the U.K. on educational attainments and hourly wage at 33 and 42 years. Results from these studies are very similar,

confirming that a long-lasting positive effect of preschool attendance is consistent across countries. The former study finds that staying in preschool 3 years (instead of 1) increases monthly wage by 4.6 percent, while the latter finds that having attended preschool increases hourly wage by 2.7 percent at age 33 and by 3.6 percent at age 42. Dumas and Lefranc (2010) also provide a very interesting result: the positive effect on wages remains, whether controlling or not controlling for final education. This issue has been raised by other studies in this literature (Chetty et al., 2011): a possible explanation is that preschool favors the acquisition of noncognitive skills that are rewarded in the labor market, such as self-esteem and socialization. As suggested by Cunha, Heckman, Lochner and Masterov (2006), even when early childhood policies do not improve directly cognitive skills, it improves the noncognitive ones, with subsequent effects on labor market and behavioral outcomes.

Finally, Havnes and Mogstad (2010; 2011) estimate the long-term effects of a policy implemented in Norway during the 1970s, aimed at increasing formal preschool attendance. Havnes and Mogstad (2011) evaluate the impact on several outcomes related to both the educational perspectives of children when adults and to their labor market experience: years of education, having attended some years of college, being high-school drop-out, earnings and being on welfare. Their results have the expected signs, confirming that the policy has increased years of education and the probability of attending college and decreased the probability of being on welfare and dropping out of high-school. However, they find negative effects of the policy on the probability of being low- and high-wage earners, while the effect is positive on the probability of being an average earner. These heterogeneous impacts are further investigated in Havnes and Mogstad (2010), who evaluate the impact of the policy on the entire earnings distribution. They find that the policy has been more effective for children in the lower and median part of the distribution, up to the 70th percentile, while it has been detrimental for those in the higher part of the distribution, who would have earned more without the policy implementation. This result seems to suggest that child care policies have heterogeneous effects on the population: in particular, they might be stronger for children belonging to disadvantaged backgrounds (e.g., in the lower part of the earnings distribution) but they might be ineffective for children with higher socio-economic status (e.g., in the upper part of the earnings distribution). In fact, children with high socio-economic status were already receiving investments from their parents before primary school, so they did not benefit from the policy. On the contrary, the policy has been effective for those who receive a

low initial level of investments in human capital from their parents. In the next section, we will further look at the potential heterogeneous effects of external child care.

As it emerges from this overview, there are no studies estimating either the short-run or medium-run effects of child care for Southern European countries. However, studying these countries has relevant policy implications. First of all, child care availability in these countries is much lower than in Northern Europe countries; secondly, since maternal employment rate is low, the introduction of child care policies may create an incentive to participate to the labor market. Our research will fill this research gap, focusing on the relationship between public child care availability and child care use during early childhood and child outcomes in primary school as well as outcomes in adult life in Italy.

#### **2.4. Child care impacts by socio-economic status, gender, migrant status and disability**

In this section we will consider important differences in the impacts of child care across population subgroups. Almond and Currie (2011) show that girls, children with low-educated parents or those belonging to low socio-economic backgrounds benefit most from child care attendance. The importance of child care policies depends on the possibility of providing more opportunities to children coming from disadvantaged contexts. These policies, in fact, ensure that all children, whether or not their parents have a job, can access high-quality early childhood education and care services. This is crucial for the development of the child and his/her subsequent education. It is also widely recognized as a means of compensating for economic disadvantages and effectively paving the way for a child's future successful development (EAPN & Eurochild, 2013). In the literature, several studies provide evidence of heterogeneous child care impacts according to the child's socio-economic status, migrant status or gender.

In the U.S. literature, several studies have evaluated the long-run impacts of child care programs targeted toward disadvantaged households and children. The most famous program is Head Start, started in 1965 (ACF, 2002). Early Head Start has targeted low-income pregnant women and families with children from birth through age 3. In 1996, an impact study was conducted, referred to 17 Early Head Start sites and 3,001 children from enrollment to age 3. Random assignments within site have been possible due to the existence of waiting lists of eligible households. In fact, when families applied to Early Head Start, the program

accepted applications for twice as many children as could be enrolled. Half were randomly assigned to a control group and half were assigned to a program group. The program has been evaluated, among others, by ACF (2002) and by Love et al. (2005). They consider both cognitive, as Mental Development Index and Mathematics test scores, and noncognitive outcomes, as aggressive behavior, at age 3. They find a positive impact of the program on cognitive achievements; moreover, children enrolled in Head Start are found less likely to score below the 'at risk' range. There have been other programs in the U.S., such as the Carolina Abecedarian or the Perry Pre-School. The Carolina Abecedarian project recruited four cohorts of children in North Carolina, from 1972 to 1977. The treated children entered the program very early (between 6 week and 3 months old). It was a very intensive program, since they attended a preschool center for eight hours per day, five days per week, 50 weeks per year until the mandatory school age. The Perry Pre-school program treated five cohorts of children in Michigan from 1962 to 1967. Children were randomly assigned to treated and control groups. Most treated children entered the program at age three and remained in it for two years, while the first wave entered the program at 4, and attended only one year of treatment. Treated children attended the program five mornings per week from October through May and received one 90 minute home visit per week. Currie, Garces and Thomas (2002) find that attendance of Head Start increases the chances that a child will attend high school and college and increases adult earnings by 19 percent. Barnett and Masse (2002) assess the impacts of the Carolina Abecedarian Program on children at 21 years of age and find positive effects on the probability of attending college. Belfield, Nores, Barnett and Schweinart (2006) consider the effects of the Perry Pre-School program also on outcomes such as employment, criminal activity, education and welfare dependence: each dollar spent for the program has a rate of return equal to 17 percent<sup>1</sup>. Heckman, Moon, Pinto, Saveryev and Yavitz (2010) estimate the rate of return of the Perry Preschool program controlling for some observed characteristics of children and parents, which might have affected the estimates reported by Belfield et al. (2006). In this way, they find a rate of return ranging between 7 and 8 percent. However, the authors argue that this estimate represents a lower bound of the true effect, since it does not consider other unmeasured positive implications of the program, such as household savings induced by child care cost subsidization, and, most importantly, the improved well-being of the children and families after the program.

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<sup>1</sup> In a cost-benefit analysis framework, the rate of return of a program represents the annual rate of return that equalizes the present discounted value of costs and benefits in the treatment group (i.e., children who attend the program) with the one in the control group (i.e., children not attending the program).

Several studies also consider the effectiveness of these programs for immigrant children. Currie and Thomas (1995; 1999) evaluate the effects of the program Head Start on grade repetition and preventive health services use at 10 years of age. Currie and Thomas (1995) find that the program is associated with large and significant gains in test scores among both whites and African-Americans; however, among African-Americans these gains are rapidly lost. Head Start significantly reduces the probability that a white child will repeat a grade, but it has no effect on grade repetition among African-American children. Both whites and African-Americans who attend Head Start or other preschools gain greater access to preventive health services. Deming (2009) also reports a large fade-out in test-scores for African Americans, unlike for Whites or Hispanics. Other studies focus on other minorities, such as Hispanic children, whose educational attainment is persistent poorer than that of non-Hispanics. Currie and Thomas (1999) estimate that Head Start closes at least 1/4 of the gap in test scores between Hispanic children and non-Hispanic white children, and 2/3 of the gap in the probability of grade repetition. Gormley and Gayer (2005) and Gormley (2008), assessing the impacts of a pre-kindergarten policy implemented in Oklahoma (US), find stronger effects for black children (Gormley and Gayer, 2005) and for children whose parents were born in Mexico: both of them, in fact, may need more help to compensate for their linguistic and social disadvantages.

The empirical evidence for Europe is still limited. Our project deals with this issue, focusing on the implications of child care policies for migrant children, and studies whether child care policies in Europe may have differential effects on children belonging to different socio-economic backgrounds or with migrant status.

Moreover, gender differences are also important since there is a growing gap in achievement between females and males. In fact, child care policies, having differential effects on boys and girls, may help in mitigating the gender wage gap or other differences in life-cycle behavior between men and women. For instance, Havnes and Mogstad (2011) provide evidence that a preschool policy implemented in Norway during the '70s strongly determines a delay in child bearing and family formation for women and also improves their labor market attachment. Hansen and Hawkes (2009) find that, for school readiness score, formal care in U.K. is associated with higher test scores for girls only. Felfe et al. (2012) find that the effect of reform of preschool implemented in Spain during the 1990s is stronger for girls than for boys in both Reading and Math test scores. However, other studies report opposite results.

Berlinski et al. (2008) find that the gains from the preschool expansion program and preschool education in Argentina are similar for boys and girls. Goodman and Sianesi (2005), for the U.K., find a stronger effect of pre-compulsory education on boys only and that this effect mostly disappears over time.

Studying differential effects of child care on boys and girls is particularly important in Southern Mediterranean countries, such as Italy, where a performance gap in achievements (especially in Math) between girls and boys is already present at age 7 (INVALSI, 2011). This gap may persist in the long run and may also indicate differential opportunities for male and females in the labor market. In our project, we will contribute to filling this gap by studying how the availability of child care across Italian regions influence the cognitive achievements and the well-being of both boys and girls, using Sen's capability approach. More precisely, in order to capture the multidimensional aspect of well-being we will take into account two simultaneous capabilities: cognitive ability and the ability to play.

Early child care may play a significant role especially for children with special educational needs (SEN). In fact, it is well known that effective support for children with SEN should begin as early as possible. Programs targeting children with SEN from birth up to age three have the main goals of supporting families in investing in their children's development and of promoting and encouraging children's development and copying confidence; it is possible this may prevent the emergence of future problems. For these reasons, in some countries, access to public child care is granted (by law) to children with special educational needs or disability.<sup>2</sup> A recent report of the European Commission (European Commission, 2013) lists several early childhood programs that have been explicitly targeted toward children with SEN, such as the program Sure Start in the U.K., or mainstream early childhood services that can include children with SEN (such as in Finland, England, Germany, Iceland, Norway). The debate on children with SEN is in fact related to the issue of whether to include children with SEN in mainstream child care and preschool or, instead, to provide them special care and schools. Whilst in most EU Member States the preference is still to maintain some form of special education, the general trend is toward reducing the number of special schools and increasing the number of children with SEN in mainstream schools. European Commission (2013) shows that any differences in outcomes for children with SEN between special and

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<sup>2</sup> This is the case of Italy, England, Germany, Iceland, Norway, Spain, Sweden and the Netherlands (European Commission, 2013).



mainstream schools are small, but tends to favor mainstream schools in terms of educational attainments and social integration. Peters (2003) finds that other children may also benefit from the inclusion of children with SEN in their schools: their inclusion forces teachers to devote more energy to the curriculum to ensure it is appropriate for the learning needs of all children, which increases the teachers' overall teaching skills. Contact with children with a disability in an inclusive setting is also said to increase familiarity and reduce prejudice over the long term.

Unfortunately, the literature focuses mainly on the U.S. and the U.K. and therefore does not take into account cultural and social welfare differences that could affect the well-being of families with disabled children in different contexts. Moreover, there is a lack of European comparable, nationally representative data specifically focused on children's disabilities and involving the characteristics of family members. Our project deals partially with this issue, providing further evidence for European countries.

### **3. Household investments**

#### **3.1. Household inputs and child development**

Until very recently, data on how parents and children spend their time has been limited. Recent studies on the relationship between household time investments and children's outcomes mostly refer to the U.S., Germany, France and Italy, where data on the time use of parents and children have been available. The studies for the U.S. do not find significant differences in the amount of time spent with the child across mother's employment status (Bianchi 2000; Hoffert & Sandberg 2001). The lack of significant differences in maternal child care time between working and non-working mothers may be the result of three main factors.

First, the number of children of non-working mothers in external child care has increased in recent years. Bianchi (2000) shows that from the end of the 1960s to the end of the 1990s, the percentage of children 3-5 years old enrolled in some form of pre-primary educational programs increased from 7.9 to 51.7 for mothers in the labor force and from 4.8 to 44 percent for mothers not in the labor force.

Second, working and non-working mothers may allocate their time at home differently, so that actual maternal contact time does not correspond to the time they spend outside of work. For instance, working mothers, even if spending more time in the labor market, may give priority to the time with their children instead of own leisure. According to data from the American Time Use Survey 2005-2009 (U.S. Census Bureau 2013), the amount of time spent by mothers reading and playing with the child does not vary crucially among employment status (4.76 for working mothers versus 6.86 for the non-working ones); on the contrary, working mothers spend significantly less time in activities like socialization or doing sport, i.e., activities usually defined as *leisure* (U.S. Census Bureau 2013). Gimenez-Nadal and Molina (2013) use data from the Multinational Time Use Study (MTUS) for Spain (2002) and the U.K. (2000) and find that the mother's education is associated with an increase in the time devoted to educational child care by fathers in both countries and that mother's education is also associated with an increase in the time devoted to educational child care in Spain. Bonke and Esping-Andersen (2011), exploiting data from Denmark, argue that it is the assortative mating in education within the couple that matters: in fact, both parents spend less time with the child and also child care is more traditional and gendered if both parents are low-educated; instead, if both parents are highly educated, they spend more time with the child, and child care within the household is shared more equally.

Third, the father's involvement in child care has increased during the last decades. Bianchi (2000) shows that in the U.S. the ratio between father's and mother's time spent with children shifted from 0.51 in 1965 to 0.65 in 1998. Bianchi and Milkie (2010) document that fathers are doing more in the home, even if women are still more specialized in home activities and men are doing more in the market place. Guryan, Hurst and Kearney (2008) find that mothers and fathers try to synchronize their time with the child, in order to avoid leaving the child alone. In general, both mothers and fathers seemed to spend greater amounts of time in child care activities in the late 1990s than in the "family-oriented" 1960s (Sayer, Bianchi & Robinson 2004). Moreover, the growth of father-friendly legislation across European countries seems to have increased the amount of time fathers spend with their children (Smith & Williams, 2007). While the mother's time is widely recognized as a crucial input in the production process of child outcomes, the father's time may be equally productive, especially in some stages of child life.

A different picture emerges for non-intact households. Keding and Bianchi (2008) show that lone mothers in the U.S. spend less time with their child, but the differences with married mothers almost disappear when controlling for socio-economic characteristics. In other words, the lower amount of time spent with the child observed in single parent families may also be due to the social and economic conditions of the single parent. Craig and Mullan (2012), using data from Time Use Surveys for Australia, U.S., Denmark and France, show that differences in child care time between lone and married mothers are not large and that lone mothers tend to spend as much time as partnered mothers with their children.

Other differences emerge when one of the family members is affected by a disability. Several studies emphasize that parents of children with a disability indicate more stress than parents of children without disabilities. Families where there is a disabled child usually have more financial problems, more difficult emotional relationships among family members and more frequent cases of depression and time restrictions due to care demands (Olsson & Hwang, 2003). However, new research has shown that some families also show positive consequences (for example, the feeling of being able to enjoy the important things in life) and have the strength to cope with everyday difficulties (Knox, Parmenter, Atkinson & Yazbeck, 2000). Unfortunately, the literature is focused mainly in countries like the U.S. and the U.K. and therefore does not take into account cultural and social welfare differences that could affect the well-being of families with disabled children in different contexts. Moreover, there is a lack of European comparable, nationally representative data specifically focused on children's disabilities and that include the characteristics of family members.

Grandparents also contribute to child care when both parents are at work. Data from the 2004 Survey of Health, Ageing and Retirement in Europe show that 49 percent of Western European grandfathers and 58 percent of grandmothers provide some kind of care for grandchildren (Hank & Buber, 2009) and that from 20 percent to 40 percent of them care for their grandchildren on a regular basis (weekly or more often). A large number of parents relies on grandparents for child care because they perceive them as the most trustworthy, providing a safe and emotionally nurturing environment that benefits their children. Other parents choose grandparental child care because it is the most convenient and flexible. Grandparents are the second most significant group of non-maternal child care providers, second to the male partners (Fergusson, Maughan, & Golding, 2008). Grandparents who live nearby are more likely to provide child care than those who live further away, particularly if

regular care is considered. The share of Southern European grandparents looking after grandchildren almost weekly or more is twice as high as in other EU countries (Hank & Buber, 2009). The literature has almost completely neglected the consequences of care provided by grandparents. To the best of our knowledge, there is only one study by Hansen and Hawkes (2009), which refers to the U.K. and finds that children in their grandparents' care have lower vocabulary and readiness school scores than children in formal child care.

### **3.2. Empirical findings on household time investments**

The literature assessing the determinants of child development consider child outcome as the result of a cumulative process of knowledge acquisition, fostered both by family and school inputs, as well as by the child's specific initial endowment (Cunha & Heckman, 2007; Todd & Wolpin, 2003). Non-parental child care, as well as the time and goods the parents spend for their child, are the inputs chosen by parents. Due to the scarcity of available data on all relevant inputs, the majority of studies do not estimate the effect of parental time directly but use proxies for the omitted variables instead. In fact, the amount of time spent by parents with the child cannot be available or precisely measured in survey data. For this reason, the majority of existing studies use the employment of parents as a proxy for their time with children (Keane, 2010).<sup>3</sup>

Hill, Waldfogel, Brooks-Gunn and Han (2005) analyze the effect on child outcomes of 4 typologies of maternal employment from the U.S. National Longitudinal Survey of Youth data: mothers who never worked in the first three years of having their child, mothers who did not work in the first year but worked sometimes in the following 2 years, mothers who went back to work full-time in the first year of their child and mothers who went back to work part-time. Small but significant negative effects of maternal employment on 5-6 year-old children's cognitive outcomes (Reading and Math) were found for full-time employment in the first year post-birth, as compared with employment delayed until after the first year. The effect of early maternal employment varied across different types of children and families, with disadvantaged children showing a smaller negative effect. Using the National Institute of Child Health and Human Development (NICHD) a negative effect of maternal employment has been found during the child's first year of life, even controlling for child-care quality, the

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<sup>3</sup> For instance, maternal time with the child can be simply defined as the difference between the total time endowment of the mother and the time the mother spends at work.

quality of the home environment and for maternal sensitivity (Brooks-Gunn, Han & Waldfogel, 2002; Brooks-Gunn, Han, & Waldfogel, 2010). Conversely, Cooksey et al. (2009) find that there is little evidence of harm to school-age children from maternal employment during childhood, especially if employment is part-time, and in contexts where maternity leave is available.

Ermisch and Francesconi (2005) summarize existing studies in the economics literature evaluating the impact of maternal employment on several child outcomes, such as attainment and years of schooling, and report that maternal employment estimates range from being detrimental (Bernal, 2008; Chase-Lansdale, Desai & Michael, 1989; Ruhm, 2004) to having no effect (Blau & Grossberg, 1992; Chase-Lansdale et al., 2003; James-Burdumy, 2005) to being beneficial (Parcel & Menaghan, 1994; Vandell & Ramanan, 1992). However, as we have seen in the previous section, maternal employment cannot exactly measure the actual time that mothers and fathers spend with their children. A more accurate measure of the time investments in children can be provided by time diary surveys. Time diary surveys usually contain detailed information on the time children spend in different activities with the mother, the father and other adults, but only a few studies have used time diaries to measure time investments in children.

A longitudinal study by Huston and Rosenkrantz Aronson (2005) analyzes the relationship between maternal time allocation and children's social, affective, cognitive and linguistic development in the first three years of life. More than a thousand U.S. families were involved in the NICHD Study of Early Child Center, with time allocation measures collected when children were 7 months old. Compared to non-working mothers, employed mothers spent less total time with their children; nevertheless, they allocated their time differently, mainly by reducing instrumental care and preserving social interaction with their children. Maternal time with the infant was unrelated to children's social competence development and attachment security at 24 and 36 months, to cognitive development at 24 months and to vocabulary comprehension at 36 months. However, the study shows insufficient information about the content and quality of the mother-child interaction, and paternal time allocation was not considered.

In the socio-economic literature, some recent studies have analyzed the effects of time allocation within the household and children's development. The majority of them refer to the

U.S. and exploit data from the Child Development Supplement (CDS) of the Panel Study of Income Dynamics (PSID) that allow cross-referencing of information on parental time allocation and on external child care use and household labor supply. Hsin (2009) finds a positive and persistent effect of the time mothers spend with children on children's language development, but only among children with verbally skilled mothers. Her findings suggest that maternal time may differentially affect children because women differ in their ability to influence their children's cognitive development. Felfe and Hsin (2012) using the same dataset find that maternal time spent in educational activities has a positive correlation with cognitive outcomes of children, measured by the Letter Word and the Applied Problems scores; maternal time with the child in social activities (e.g., visiting friends, attending events) decreases both internal and external behavioral problems.

Focusing on European countries, Cardoso, Fontainha and Monfardini (2009) analyze the relationship between parents' time allocation and the amount of time that the child spends studying and reading, watching TV or socializing, using data for Germany, Italy and France. They find that the amount of time that the mother spends in each type of activity matters for the child in all countries, while the father seems to matter less; both mother's and father's time spent watching TV increases the amount of time spent by the child doing the same activity. Mancini, Monfardini and Pasqua (2012) analyze the effect of parents' time allocation on children's behavior and outcomes, looking at the intergenerational transmission of habits between parents and children in Italy. Specifically, they exploit data from the Multipurpose Survey on Time Use in order to assess whether the fact of living with parents who regularly read has an impact on the probability of the child reading too. They find that children are more likely to read and study when they live with parents that regularly read. Mothers seem to be more important than fathers in this type of intergenerational transmission. Moreover, their analysis shows that there is an imitation effect: on the day of the survey, children are more likely to read after seeing either their mother or father reading.

As we have seen in the previous section, time allocation of mothers in single-parent households may be different than in two-parents households and may have consequences on the child's development. Becker (1991) pointed out that divorced parents have less time to devote to their children, causing a negative effect on children's development. Amato (1993) shows the impact of conflicts between parents before or during the dissolution. Results from the literature are in fact non conclusive. Aughinbaugh, Rothstein and Pierret (2005) report that

youth from non-intact families are more likely to drop out of school, become pregnant out of wedlock, have troubles with law, have behavioral problems and score lower on cognitive tests. On the contrary, Hoffert (2006) shows that family structure does not seem to affect achievements, but does affect behavioral problems. Francesconi, Jenkins and Siedler (2005) argue that most of the literature on non-intact families finds worse child outcomes because they do not control for possible correlation between common unobserved determinants of family structure and educational performance. Trying to take into account this plausible correlation using different methodologies (sibling fixed effects and instrumental variables) they find that family background (i.e., parents' education, parents' socio-economic status, etc.) matters more than family structure and the negative effect of living in a non-intact household is reduced. Sanz-de-Galdeano and Vuri (2007) also report that students experiencing parental divorce also performed worse before the divorce, meaning that parental dissolution is associated with a very modest decline in test scores.

In this project, we will cover several of these gaps in the literature. First of all, we will provide further evidence of the effects of parental time investments on child's development using detailed time use data for the U.S. and Italy. Secondly, we will contribute to the literature looking at the implications of maternal employment taking into account the actual time spent by the mother with the child and the amount of time the child is cared for by someone else, as well as the time the child spends with the father. Third, we will include among the household time investments also the investment decisions made by grandparents and the ones made by children themselves once they reach adolescence. In fact, while the effects of parental investments have been largely considered in the literature, the decisions made by the children have been almost neglected.

Table 4. Selected studies evaluating the effects of household investments on children's development and/or time allocation.

Study	Country	Data	Estimation Method	Results
Cardoso, Fontainha and Monfardini (2010)	France, Germany, Italy	Time Use Surveys (TUS) for France, Germany and Italy	Fractional logit model	Effect on share time allocated to reading and studying by the mother + in all countries. Effect on share time allocated to socializing by the mother + in Germany and Italy, by the father + in France. Effect on share time allocated to watching TV by the mother + in all countries
Mancini, Monfardini and Pasqua (2011)	Italy	Time Use Survey	Household Fixed Effects linear probability model	Effect of observing one parent reading on the probability that the child reads too +
Hsin (2009)	U.S.	Child Development Supplement	OLS	Effect of mother's time on child's cognitive outcomes + only for verbally skilled mothers
Hsin and Felfe (2012)	U.S.	Child Development Supplement and Panel Study of Income Dynamics	OLS, Value Added and Individual Fixed Effects	Mother's educational time impact on child's cognitive outcomes is +. Mother's social time impact on child's behavioral outcome is +
Hansen and Hawkes (2009)	U.K.	Millennium Study	Cohort OLS	Grandparents' care when the child is 8-months old impact on child's vocabulary score at 3 years of age +. Grandparents' care impact on child's readiness school score at 3 -. Grandparents' care impact on child's behavioral outcome at 3 -

### 3.3. Empirical findings on household monetary investments

Among the investments that the child receives within the household, the importance of household income and the expenditure in goods and services for the child should be stressed. In fact, household income plays a very significant role for the child, since it has been shown that poverty during early childhood can seriously undermine the development of children; this is particularly important for children living in single-parent households or with migrant status



(Bennet, 2008; TARKI, 2011). For this reason, in addition to the literature on parental time, another literature stream examines whether family income influences child development.

Despite a large body of evidence documenting the association between family income and child development, there is much controversy about whether these correlations can be given causal interpretations. Like the parental time literature, the results in the family income literature are mixed. Using instrumental variable strategies, the estimates reported in Dahl and Lochner (2008) suggest some positive effects of family income on children's (short-run) outcomes in U.S., while Loken (2010) finds little impact of family income for Norwegian children. Using sibling differences in family income to control for permanent differences in family environment and exploiting data from the United States, Levy and Duncan (2000) find that family income is important for children's educational attainment, whereas Blau (1999) finds a small effect of family income on child outcome. Loken, Mogstad, and Wiswall (2012) exploit administrative data from Norway and report a positive relationship with stronger effects of family income on child outcomes for poor families and little effect for richer families. However, for the majority of households, most income is derived from labor market participation, and labor supply directly trades off with time spent with children. Parents with higher levels of income may then be working more in the labor market and providing lower levels of time investments in their children. This channel may dampen or even reverse the assumed positive relationship between income and child development.

However, as shown in some recent reports (e.g., European Commission, 2009), the most important factor of poverty and social exclusion refers to parental employment status, namely joblessness and low work intensity (Del Boca & Mancini, 2012). Even if parental employment decreases the amount of time parents spend with the child, this may ensure a reduction in the likelihood that the child grows up in poverty. Moreover, this point stresses again the importance of providing universal access to child care and preschool, in such a way that these services represent a good alternative for the mother's and father's time. Child care can provide an opportunity for children to develop better social skills in pre-school settings and to benefit from care by professionals in formal and less formal (but socially organized) care institutions. Therefore, both the availability, the quality and the accessibility of child care are important aspects that contribute to child well-being, and can also improve the parents' willingness to use the service in order to devote more time to the market.

It should be noted that all the studies reported included in this report use specific outcome variables, which can be interpreted as measures of child's development and well-being. However, we are aware that individuals' quality of life comprises multiple dimensions, linked to both objective and subjective aspects of well-being. While the present studies mostly use quantitative measures of different aspects (for instance, test scores, wages and behavioral indicators) the child's well-being extends beyond income and material conditions, as has also been stressed by the Commission on the Measurement of Economic Performance and Social Progress – by Stiglitz, Sen and Fitoussi (2009), the British New Economic Foundation (Seaford 2011), OECD and also the General Assembly of UN. This includes approaches to human development (i.e., for UNDP), poverty alleviation and health (i.e., for World Bank), and social exclusion that emphasize capabilities and functioning (Sen, 1985; Nussbaum, 2000). In our research we will analyze this issue, using subjective well-being assessments to measure the subjective well-being of parents and their children. Especially for children, non-monetary and non-economic well-being can be operationalized in terms of different “capabilities”, according to the theory by Sen and Nussbaum (Sen, 1985; Nussbaum, 2000).

#### **4. Concluding remarks**

This review presents an overview of some recent studies on child care determinants and consequences for children's development. Comparison of the U.S. and several European countries underlines the importance of institutions in modeling the opportunity sets available to parents when they make their non-parental child care decisions.

The existing literature on the impacts of non-parental child care on child's outcomes does not provide homogeneous results. This diversity can be mostly explained by the diverse data sets, methodologies and institutional contexts considered and by the characteristics of child care.

All studies evaluating the impacts of non-parental child care in the short- and medium-run find positive effects on cognitive outcomes, while the implications for the noncognitive ones are mixed. Much of the effectiveness of early childhood interventions comes from boosting cognitive and noncognitive skills, which can have substantial effects on schooling and labor market outcomes during adulthood. Positive effects of preschool attendance and preschool policies on adult earnings are found in the U.K., France and Norway, and the magnitude of the impacts is similar across countries. However, not all children may equally benefit from a

policy increasing child care or preschool availability. While positive long-run effects of child care policies have been found, on average, for the U.K. and France, in Norway such benefits are seen only for children in the lower part of the earnings distribution. This result also confirms that child care and preschool intervention can be more effective for children from disadvantaged backgrounds, because it can provide better educational inputs than those they would receive at home.

This result is also stressed by studies estimating heterogeneous child care impacts across different subgroups, i.e., by socio-economic and migrant status and by gender. In fact, there is evidence, in particular, from the U.S. literature, that child care and preschool policies can be more effective for disadvantaged children and families, because they may provide better opportunities than those available at home. However, while the positive effects of child care for disadvantaged and migrant children are robust across studies and methodologies, results looking at differential effects by gender are mixed. Child care policies are also found to be effective for the development and the social inclusion of children with disability and special educational needs.

The extensive literature on the effects of external child care on child development has been also accompanied by several studies evaluating the impacts of maternal employment on child outcomes. Time use data, only recently made available, now allows direct estimation of the effects of maternal time on child development. While maternal time is crucial for child development, the father's and grandparents' time may also be important. There is already some evidence that the father's time can be a good substitute for maternal time, especially when the child grows up, but the potential effects of grandparents' care is less well-explored.

The literature on non-parental child care and household time investments on children presents some research gaps that the FamiliesAndSocieties project will fulfill. More precisely:

- In our project, we will study how the availability of child care across Italian regions influence the cognitive achievements and the well-being of both boys and girls, using different approaches including Sen's capability approach. This may be important not only for providing further evidence for Southern European countries, but also for presenting the effects of non-parental child care taking into account the multidimensionality of children's well-being.

- In the literature, there is a lack of European comparable, nationally representative data specifically focused on children's disabilities and involving the characteristics of family members. Our project deals partially with this issue, providing further evidence for European countries.
- Concerning the role played by household members, i.e. fathers and grandparents, we will provide further evidence of the effects of parental time investments (both mothers and fathers) on child's development using detailed time use data for the U.S. and Italy.
- Finally, we will include among the household time investments also the investment decisions made by grandparents and the ones made by children themselves once they reach adolescence. In fact, while the effects of parental investments have been largely considered in the literature, the decisions made by the children have been almost neglected.

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