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ABSTRACT

PARENTAL EDUCATION AND TIME WITH CHILDREN:
AN ANALYSIS USING 2006 TURKISH TIME
USE SURVEY

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Parental childcare time, as one of the channels that transfer the positive effects of parental education to children, is important for the development and formation of human capital of children. It is studied in many countries using time use data; however, the effects of parental educational level on their childcare time in Turkey have not been studied yet. Time-diary data from the 2006 Turkish Time Use Survey of TurkStat is used to investigate the factors affecting parents' time investments in childcare in Turkey. However, the primary interest of the study is the effect of parental education level on childcare time. In order to investigate the determinants of parental childcare time, a double hurdle model is used in order to handle huge number of zeros of childcare time. Results show that being graduate from the university or having a higher degree is significant for parents' childcare time allocation decision. University graduate parents are more likely devote time to their children. Moreover, any educational level is found to have a positive impact on the amount of childcare time of them. Compared to uneducated parents, educated parents certainly spend more time with children at home. Another important factor affecting parents' childcare time is educational level of spouses. While men who have university graduate spouses are more likely to devote time to their children, women who have university graduate spouses are less likely to devote time to their children. Additionally, fathers having an educated spouse spend more time with their children.

Keywords: Childcare time, parental education, Turkey, time-use, double hurdle model

ÖZ

EBEVEYN EĞİTİMİ VE ÇOCUKLARLA GEÇİRİLEN ZAMAN:
2006 TÜRKİYE ZAMAN KULLANIM ANKETİNİ KULLANARAK YAPILAN BİR ANALİZ

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Ebeveyn eğitiminin olumlu etkilerinin çocuğa aktarılmasında ebeveynlerin çocuklarıyla geçirdiği zaman önemli olmakta ve bu onların gelişiminde ve beşeri sermayelerinin oluşumunda rol oynamaktadır. Anne-baba eğitim düzeyinin çocuklarıyla geçirdikleri zamana olan etkileri pek çok ülkede çalışılmış olmasına rağmen, Türkiye'de henüz incelenmemiştir. Bu bağlamda, Türkiye'de anne-babaların eğitim düzeyinin çocuklarıyla geçirdikleri zamana etkisini incelemek için TÜİK'in 2006 yılında yapmış olduğu Zaman Kullanım Anketi verileri kullanılmıştır. Eğitimin yanı sıra, bu zamanı etkileyen diğer faktörler de tezde tartışılmıştır. Anne-babaların çocuklarıyla geçirdikleri zamanı etkileyen faktörleri ortaya çıkarabilmek için çift engelli model (*double hurdle model*) tahmin edilmiştir. Bu modelin tercih edilme sebebi, bağımlı değişken olan zamanın pek çok anne-baba için sıfır olmasıdır. Sonuçlar üniversite mezunu olmanın ebeveynlerin çocuklarına zaman ayırma olasılığında etkili olduğunu göstermiştir. Üniversite mezunu anne babaların okula gitmemiş ebeveynlere göre çocuklarına zaman ayırma olasılığı daha yüksektir. Ayrıca, eğitimin çocuklara ayrılan zaman üzerinde de istatistikî olarak anlamlı etkisi bulunmuştur. Zaman harcayanlar arasında eğitimli anne babalar çocuklarına daha fazla zaman ayırmaktadır. Erkeklerin çocuklarıyla geçirdikleri zaman üzerinde etkili olan bir diğer eğitimle ilgili faktör ise eşlerinin eğitim düzeyidir. Eğitimli eşi olan erkekler çocuklarıyla daha fazla zaman geçirmektedir.

Anahtar Kelimeler: Çocuk bakımı, ebeveynlerin eğitimi, Türkiye, zaman kullanımı, çift engelli model

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I thank my mom and sister for encouraging and supporting me throughout all my life.

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CHAPTER 1

INTRODUCTION

Economists have long recognized that human capital is a part of a country's resources as Smith stated in 1776 but the concept of human capital was used in the literature of economics in 1960s for the first time (Schultz, 1961; Becker, 1965). It is defined as "the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being" (OECD, 2001, p. 18). In order to boost long term economic prosperity, labor force with high level of knowledge and skills is necessary. Due to diminishing marginal returns, increasing inputs such as capital stock is inefficient to generate long run economic growth. Therefore, technological development and productivity increases through human capital investment determine economic performance of countries in the long term. Expenditures on education, training, information and health are the most important investments in human capital. Such investments result in increase in earnings, productivity, knowledge, ability and physically and psychologically healthy individuals. Despite of the presence of a great number of researches on human capital investments, much more attention has been paid to the formation of human capital through education because of the existence of data on schooling. However, seeing schools as the only responsible entity for developing children's skills and knowledge would be wrong. Not only schools but also home environment and parental investments contribute to human capital of a child (Todd and Wolpin, 2003). Thus, the scope of economic theory has been extended along family, and nonmarket household production.

Family is the smallest unit in the society and human capital formation starts at home. The main environment for children, especially for preschoolers, is the family and parents are the first and permanent teachers and also role models of children. Families are as important as schools in shaping youths' skills and

developing their knowledge (Israel et al., 2001). The preparation of children by families affects children's schooling, labor market performance and social life. In other words, the care and well-being of children represent the future well-being of the society. Family provides not only material but also non-material resources in order to contribute to children's physical and non-physical development. However, many researchers have studied the monetary investments in children and neglected time devoted to children in order to develop their human capital. Good-quality investment possibly results in better mental, physical and cognitive development of the child; however, how to measure the quality of care and investment is an unanswered question (Leach, 2009).

Although the production function for child's human capital is not known exactly, it is presumably affected by the home environment, family characteristics, parents' behavior and attitudes, their child-rearing practices and their investment in children (Price, 2010). According to Coleman (1988), there are three types of capital that a family provides: (1) human capital, (2) financial capital and (3) social capital. Family-based social capital refers to a supportive parents-child relation and is based on the time spent together. Human capital of parents is surely decisive in the formation of human capital of children but it should be accompanied by family-based social capital in order to ensure child development (Coleman 1988). If parents are not actively involved in a child's development, reproduction of human capital do not occur in the family. In other words, parents' physical existence and educational, emotional and moral support to children are the main pathways transmitting parents' human capital to the child, which is called 'social capital' by Coleman (1988). Children's cognitive and social skills are formed by parenting practices and this, in turn, influences child's schooling level and working life. Additionally, the educational level of parents is conjectured to determine their parental behavior, child-rearing activities and their investment. As Davis-Kean (2005) and Davis-Kean, Sexton and Magnuson (2005) state, parental education indirectly stimulates children's schooling level through parents' beliefs, expectations, behaviors and attitudes towards child-rearing. Parents with a higher educational level are more

likely to expect more success of their children at school. Therefore, they encourage them more and have better teaching skills at home (Davis-Kean et al, 2005). Better-educated parents usually care more about educational achievement of their children and expectations of them towards achievement would be much higher (Israel et al., 2001; Rasmussen, 2009). Thus, well-educated parents tend to devote more time to their children and this, in turn, promotes children's lifelong achievement.

There is a large literature that emphasizes the effect of childcare time of parents on child's achievements. Additionally, there are some that put emphasize on the effect of childcare time on specifically cognitive and verbal ability, IQ level of children or their school enrollment. The most crucial period of human life for development of intelligence and personality formation is the earliest years of life. Some basic skills, abilities and knowledge are developed before school age (Young and Mundial, 1996; Saraçoğlu and Karaoğlan, 2016). Therefore, investment of parents especially during the early ages of children is crucial in child development. The only entity for development of mental skills of a child at early ages is the family.

Leibowitz (1974), Davis-Kean (2005) and Rasmussen (2009) show the positive impact of home investment of parents on the child. Home investment is the time investment of parents at home for Leibowitz and Rasmussen, and parental behaviors and attitudes like reading and playing with the child for Davis-Kean. Using the study of Lewis M. Terman conducted in 1921, the study of Leibowitz (1974) analyses impacts of home investment on IQ level, schooling level and earnings of children. Terman used the sample of the students whose IQ levels are among the top 1 percent of the national IQ of California and collected data about students and their lives at home. It was a very comprehensive study lasting for 40 years that collected data about children's final schooling level, earnings and jobs as adults. The study has demonstrated the positive effects of home investment on the IQ level of boys and older girls, and on the final schooling level and income of children when they become adults through the effects on IQ.

Davis-Kean (2005) examines how parental education indirectly stimulates children's schooling level through parents' beliefs, expectations, behaviors and attitudes towards child-rearing. She uses the 1997 data of the Child Development Supplement of the Panel Study of Income Dynamics (PSID-CDS), which is cross-sectional study of children. 868 children whose ages are between 8 and 12 are involved in the sample. Parents' and family characteristics, children's demographic characteristics, parents' behaviors and child's achievement are used as indicators in a structural equation model (SEM). The results have shown that parental education affects child's achievement not only directly, but also indirectly through parental behaviors and beliefs. In other words, the hypothesis of the author stating that parents' education has indirect effects on child's achievement through parent's thoughts, behaviors and beliefs is supported by the data. Parents' schooling level is important for their participation in home investment of their children. They are more concerned in literacy-related issues of children and more helpful in children's homework. Additionally, their expectations about schooling level of their children are much higher. In turn, these beliefs and behaviors contribute to children's achievement.

Additionally, Rasmussen (2009) examines the long-term effects of parental time on children. In order to measure the effects of parental time on children, the author examines children's high school enrollment. She uses the Danish Time Use Survey conducted in 1987 with the administrative register information. The data include working couples aged 16 to 76 who have children at the ages of 1-12. Her research shows a positive relationship between mothers' childcare time on weekdays and children's outcomes, and also, between fathers' time on weekends and children's outcomes. Rasmussen categorized childcare into two; direct childcare in which childcare as the main activity, and indirect childcare in which childcare is not the main activity. A good example of indirect childcare is helping children with their homework while watching TV. Surprisingly, such division did not create a significant difference. The author gets the same results even after this division.

Whether or not being primary activity, the childcare time is essential for the children's outcomes.

While these studies put emphasis on time investment of parents, Datcher-Loury (1988), Hsin (2008) and Gayle, Golan and Soytaş (2012) put more emphasis on mothers' time investment. Gayle et al. (2012) state that mothers' time investment is more crucial than fathers' although both affect child's outcomes positively. Datcher-Loury (1988) focuses on the effects of mothers' childcare time on child's schooling level. According to the findings of the study, childcare time of mothers is one of the variables affecting children's schooling level. The data used is from the Panel Study of Income Dynamics (PSID) of the University of Michigan and the sample consists of individuals who were children in the late 1960s, and adult men and women in 1980s. The data provide the information of housework time of mothers but it does not include childcare time of mothers separately. Therefore, it is estimated through calculating the deviation from the mean annual housework time of mothers with no children. This study firstly investigates what determines childcare time of mothers and what determines years of schooling of children. Childcare time of mothers is found to be related to the number and age of children, educational level of mothers and their educational expectations from their children and mothers' market wage. Number of children, educational level of mothers, and their expectations about children's schooling positively affect their childcare time. However, the effects of age of children and mothers' market wage decrease their childcare time. Secondly, the factors affecting the schooling level of children when they get to the ages of 20-26 in 1980s are examined and family income, educational level of parents, childcare time of mothers, fathers' occupation in white collar jobs, high expectations of parents for their children's schooling have been found to be positive determinants of the schooling level of their children. On the other hand, having a mother who gave a birth under the age 19 and having more siblings have a negative impact on the schooling level of children. Specifically, it is important to say that educational level of mothers is also essential for their childcare time. The

supportive effect of childcare time of mothers on schooling level of children is much more apparent when educational level of mothers is higher.

Gayle, Golan and Soytaş (2012) measure the returns to the parental time investment in terms of the life-time utility of children based on their educational attainment, their skills and lifetime earnings, and their marriage decisions. The data used is from the Family-Individual File of the Michigan Panel Study of Income Dynamics (PSID). They model the dynamic optimization problem by using the Becker Barro model and solve for a Markov Perfect Equilibrium. They show that the time investment of both mothers and fathers are complementary but the returns to the mothers' time investment is much higher than the fathers' time. While the time investment of fathers is decisive for graduation from high school and getting college education, the time investment of mothers are key for graduating from the college. As a result of higher educational level, they get higher return from labor market and their marriage. Gayle, Golan and Soytaş (2012) also illustrate the "specialization by gender in home production". Mothers spend significantly more hours with children than fathers. Moreover, the return of maternal time investment is much higher than that of paternal time investment.

Family origin is essential to predict individual's life outcomes. Hsin (2008) investigates how mothers' background influences their childcare time and, in turn, affects child's development. By doing so, she takes the quantity of time, types of activities and the verbal ability of mothers' that children are exposed to. The study uses time diary data and assessments of cognitive skills of child from the Panel Study of Income Dynamics and its Child Development Supplement (PSID-CDS). Mothers' time with their children aged between 0 and 5, and children's cognitive achievement at the ages between 5 and 12 are assessed. It is concluded that the educated mothers perform more educational time with their children. Moreover, the verbally skilled mothers are better educated. Therefore, the quantity of time spent with the better educated and verbally skilled mothers develops child's cognitive and verbal ability.

Due to positive effects of childcare on socio-economic status of the countries, childcare is of relevance to the economic and political sphere of the countries (Leach, 2009). Parent training programs have existed for many years and included in the programs of both governmental and nongovernmental organizations to guide parents in their relationship with their children and to improve child development. Taking such trainings help parents develop 'good parenting' behaviors and, in turn, promote health and development of their children. Israel is one of the countries that implement such a program named *Home Instruction Program for Preschool Youngsters* since 1960s. The program intends to train mothers in order to promote children's physical, social and mental development (Young and Mundial, 1996). The aim of the program is to see trained mothers' influence on their children's learning outcomes. Mothers spend time with their children to complete home activities, read books, and do some activities including games and exercises. As a result, the program results in positive impact on children's social, emotional and cognitive development. Additionally, the Mother Child Education Foundation (ACEV) is a nongovernmental organization established in 1993 in Turkey which develops many projects and programs for children, mothers and fathers in order to contribute to children's development (Kagitcibasi, 1996). Indeed, these efforts of governmental and nongovernmental organizations to develop good parenting behaviors in the family demonstrate the value of parental time investment in human capital of children. Especially in the countries like Turkey in which early childhood education enrollment rate is very low (28% according to World Bank Indicators in 2013) (Saraçoğlu and Karaoğlan, 2016), the importance of home environment and the family comes into prominence more.

Many studies prove the importance of early child development in promoting the human capital of children. Rational thinking, problem solving and reasoning ability of children are established in early childhood stage (Blakeslee, 1997; Saraçoğlu and Karaoğlan, 2016). Additionally, success in the skill formation of preschoolers shaped by the family will result in success in school and then success in the post-school years (Heckman, 2000). On the other hand, an active parent-child

relation is also beneficial for older children. The responsibility of parents does not end even when their children start formal education at school. Research results prove the importance of involving parents for the development and learning of their school-age children (Ferguson, 2008). According to the PISA results, 15-year-old children whose parents discuss political and social issues, books, films, events, issues in children's lives with them are more successful in reading skills (OECD, 2012). It makes children more informed, more curious, think out of the box and develops critical thinking. As Becker (1993) states, families' influence on knowledge, skills, beliefs, values and habits of their children cannot be neglected. The family, therefore, has the most significant role in the child's physical, psychological and intellectual development at early ages and parental time investment is one of the channels through which knowledge, skills, values and habits are transferred from generation to generation. Social capital is essential as much as physical and human capital provided by families for the creation of human capital of children (Coleman, 1988). A good number of studies show that childcare time devoted by parents is important for children's development (Rasmussen, 2009; Datcher-Loury, 1988; Leibowitz, 1974). Moreover, empirical evidence in psychology also shows the importance of parent-child interactions during child's early ages in order to understand cognitive development of the child (Hsin, 2008). On the other hand, there are many factors affecting parents' decision on how much time to allocate for child care; such as employment status, income level, marital status, educational level, number and ages of children and the existence of an older family member at home. Personal qualities and family characteristics are the determinants for the amount of social capital offered by parents.

This study will focus on what Coleman (1988) calls the 'social capital' in the family. Time that parents and children spend together will be studied. This study particularly intends to investigate the effect of educational level of parents on their time allocation towards child care in Turkey. Besides this factor, many other factors affecting parents' childcare time allocation such as employment status, income, family size, and age will be analyzed. Time allocation to childcare is studied in

many countries using time use data; however, the effects of parental educational level on their childcare time in Turkey have not been studied yet. Although the literature on parental time investment is extensive covering many developed countries, the literature for Turkey is limited. The 2006 Time Use Survey of TurkStat has made it possible to investigate the time allocation of families and its association with social policies in Turkey.

Specifically, the main objective of this study is to determine the effect of parental educational level on parental childcare time, or parental social capital as referred to by Coleman (1988). The OECD's Programme for International Student Assessment (PISA) and many other studies show that parents who give great importance to education raise successful children. If parents care about reading and learning, their child also has better ability in reading and learning (OECD, 2012).

The purpose of this study is to contribute to the empirical knowledge of family economics and to demonstrate the effects of educational level of parents on their childcare time at home. The study is mainly focused on the effects of educational level of parents on their childcare time. The objectives of the study are:

1. To assess time allocation of parents and the differences between fathers' and mothers' time allocation to childcare,
2. To identify factors influencing parental time investment in childcare,
3. To determine the relationship between parental education level and their time allocation in childcare,
4. To determine whether the background of parents such as employment status and age of parents are effective on their childcare time.

In order to answer the research questions regarding the association of childcare time of parents with their educational level a quantitative approach is adopted. The data used is the Time Use Survey of the Turkish Statistical Institute (TurkStat), covering the period 1 January-31 December 2006. The Survey collects data on time-use of individuals in a day. It further includes personal information of individuals and information related to the household.

The main variable of interest in this study is the time devoted to childcare. Using the quantity of childcare time as a measure of human capital investment may be considered problematic because it fails to take into account the quality of time and type of activity that parents and child carry out together. Although the time investment of parents with higher educational level is thought to be of better quality and to involve more educational time investment, it is not possible to measure the quality of time parent-child spend together with the data in hand.

This study intends to be one of the first which dwells into the relationship between educational level of parents and their childcare time allocation in Turkey. Besides, it shows many important factors affecting parents' childcare time although it focuses especially on the impact of educational level of parents. As a result, this study may broaden viewpoint of researchers who are interested in the study of parents' investment in children and lead public policy makers to develop suitable intervention policies towards family to enhance quality of human capital.

The thesis is organized as follows. In Chapter 2, a review of the literature is given. This chapter discusses the studies investigating the effect of parental educational level on their childcare time. Then, theoretical and empirical literature are presented. Chapter 3 presents the data and methodology. In this section, the source of data, empirical model specification, variables used and descriptive statistics are given. The results of the model are discussed in Chapter 4. Chapter 5 concludes.

CHAPTER 2

LITERATURE REVIEW

Parents' educational level influences their childcare time and, in turn, affects child's outcomes (Hsin, 2008). According to Coleman (1988), child care time of parents is a kind of social capital promoting parent-child relation and transmits human capital from generation to generation. Human capital of parents would be less effective in the formation of human capital of children without social capital provided in the family. In other words, social capital is a complementary for human capital of parents.

This section will outline the theoretical framework and summarize the empirical studies that are closely related to this study. Studies that investigate the educational level of parents as a predictor of their childcare time will be highlighted. That is, whether human capital of parents is a determinant for social capital provided by them or not is questioned.

Many studies have investigated the relationship between parental education and children's development and school achievement (Chevalier et al., 2013; Dubow et al., 2009). However, the links that transfer the positive effects of parental education to children's outcomes have been less well studied. The literature has shown that childcare time devoted by parents is important for children's development and school achievement. It has been proved that parental time investment is one of the main contributors to the well-being of children (Leibowitz, 1974; Rasmussen, 2009; Datcher-Loury, 1988). Playing with children is precious for children's cognitive, physical, social, and emotional well-being (Ginsburg, 2007). Therefore, childcare time of parents, which is one of the mechanisms that transfer parents' attitudes, beliefs, lifestyles and behaviors to children, will be studied. Besides, some studies show that parents' schooling level is important for their participation in home investment in children. They devote more time to children

because they value investment in children and therefore, they are more concerned in literacy-related issues of children and volunteer more in participating children's educational activities. Additionally, their expectations about schooling level of their children would be much higher (Davis-Kean, 2005).

2.1 Theoretical Framework

Although its origin dates back to the nineteenth century, the rebirth of 'human capital' concept in the economic literature happened in 1950s and 60s. Human capital was generally ignored by mainstream economists studying economic growth (Heckman, 2015). However, in 1960s, the traditional factors of production were not found to be sufficient in explaining economic growth of the United States. As Schultz (1961) states, the U.S. economy had experienced a period during which incomes grew much more than the growth of inputs such as land, labor and capital used in the production. Therefore, explaining economic growth through increase in inputs was no longer adequate. As a result, 'human capital' gained a place in the literature and activities improving human capital were emphasized. Education and training courses, health services, study programs, migration for better job opportunities were seen as an investment in human resources for improved performance and productivity (Nafukho, Hairston and Brooks, 2004). Investment in human capital became one of the key factors for explaining differentiation of economic growth performance of countries. Therefore, well-educated and trained workers became crucial in the production process (Becker, 1993). Beginning with Mincer, Schultz and Becker, many researchers have studied the contribution of human capital investment to productivity (Teixeira, 2008).

The family also could not find itself a place in mainstream economic theory until 1950s and 60s. Economists had not shown much interest in behavior and decision making of families until then. However, the interest on household production paved the way for the family behavior to take a place in economic theory. Especially the work of Becker in 1965, *A Theory of the Allocation of Time*,

put a spotlight on household production. Since then, economic theory has extended along the issues related to family including the allocation of time, nonmarket household production, child-rearing and so on. Mincer and Becker founded the New Home Economics in 1960s, which deals with economic analysis of home-based production and decisions. Both Mincer and Becker consider family rather than the individual as a decision-maker unit of household and regard the family as a whole unit aiming to maximize its utility (Leibowitz, 1974). Jacob Mincer, a pioneer economist of home production analysis, discussed the choice of work and leisure, and added household work as another choice variable. This choice is especially relevant for women who are more likely to choose household work over leisure or work in the market. Moreover, he emphasized education as an important form of investment and a form of human capital. Before Mincer's studies, although it was commonly agreed that education increases wages and promotes job conditions, it was not thought to contribute to the productivity of labor (Teixeira, 2008). Together with Mincer, many economists were interested in human capital and studied the factors contributing to human capital. Schultz (1972) classified seven categories of human capital investment, which are (1) schooling and higher education, (2) post-school training activities, (3) health services, (4) pre-school learning activities, (5) migration of people for different job opportunities, (6) information and (7) investment in children. On the other hand, Becker's contribution to the human capital theory is crucial because his studies are the cornerstone to understand what contributes to human capital investment and how it affects earnings, wealth, and economic growth. Additionally, Becker is the first economist who combined goods consumption with time in the household utility production (Chiappori and Lewbel, 2015; Gronau and Hamermesh, 2006). The family buys market goods in order to either consume or use it as an input in household production. Moreover, similar to Mincer, Becker also says that individuals in the family devote their time either to paid market work or to non-paid housework (Rosenzweig and Stark, 1997). The theory of Becker is based on the assumption that households are not only

consuming, but also producing some goods and services at home (Becker, 1965). Together with the studies of Becker, time took place in economic analysis.

There are many factors contributing to human capital of an individual; however, formal education is the most emphasized one due to existence of available data. Many researchers discuss the effects of education as a contributor to human capital in the marketplace; however, few studies emphasize its effects in the home production. Parents play a very important role in investment of human capital of the child. The most crucial product of the family is children (Browning, Chiappori and Weiss, 2014). The human capital of children is not something provided only at school, but family background, their attitudes and behaviors, and child inherited abilities also contribute to the formation of human capital. One of the elements of family background is parents' educational level (Todd and Wolpin, 2003). Davis-Kean (2005) examines how parental education and income indirectly stimulates children's schooling level through parents' beliefs towards child rearing, expectations, behaviors and attitudes. As Leibowitz (1974) states, childcare time of mothers with high educational level contributes to the human capital investment of children. Better educated parents play an essential role in the formation of their child's human capital through time spent helping their homework, reading books, doing sports etc. Investment of parents in a child is important to construct skilled labor force that will build a healthy, powerful and stable economy.

2.1.1 Model

The model used to analyze the time investment of parents in their children comes from the study by Willis (1974), which is on fertility, De Tray (1974) and the 1965 and 1993 studies of Becker. Willis calls it the "economic theory of the family" and uses a unitary model, where a single utility function is used for the household. Becker's model also starts with a household utility function, which is identified as a function of home produced and consumed goods. Additionally, based on Becker's work, time is introduced as an input.

Families get utility from the commodities produced and consumed in the household. Since children are viewed as one of the products of the family, unitary household utility function of household can be written as follows:

$$U = U(C, K) \quad (1)$$

where C represents the child, and K is the other goods and services such as leisure. Stocks of children compose of number of children and the quality or human capital of children. In other words, the child (C) is not directly produced through inputs (De Tray, 1974). Therefore, the function of child services can be written as

$$C = C(N, H) \quad (2)$$

N and H represent the number of children and child's quality. In order to maximize their utility, household members decide optimal amount of children and quality of children.

According to Becker (1965), the inputs of home-produced commodities are the time (t) and market goods and services (g). Using market goods and services and time, families produce and consume some goods and services, and in return, family members derive utility from this production and consumption.

Under these assumptions, it is possible to summarize the complete household production by the following equations (De Tray, 1974):

$$N = N(t_{N,f}, t_{N,m}, g_N ; \alpha, \eta) \quad (3)$$

$$H = H(t_{H,f}, t_{H,m}, g_H ; \alpha, \eta) \quad (4)$$

$$K = K(t_{K,f}, t_{K,m}, g_K ; \alpha, \eta) \quad (5)$$

where g_i represents market goods and services used in the production of the commodity i (i= N, H or K). $t_{i,j}$ is total time spent by j^{th} household member (father or mother) in the production of the commodity i. α and η is the generalized index of man's and woman's efficiency in nonmarket production, respectively. They show the environmental variables affecting mothers' and fathers' quality, such as formal schooling.

The budget and time constraints that the utility maximizing household is subject to are:

$$p_c C + p_K K \leq S + T_w \bar{w} \quad (6)$$

$$T_w + T_i = T \text{ and} \quad (7)$$

$$T_i = t_iN_i + t_iH_i + t_iK_i \quad (8)$$

where p_i is the shadow prices of the commodities (C and K). I is total income of the household composed of labor income and other income (S). Income is not something given, but it is determined by working time. $\bar{w}$is the earning per unit of T_w and T_w is the time spent at work. T_i is the total time spent to produce and consume home-produced goods and services. t_i is the time vector showing the time spent per unit of the commodity (N, H or K) (Becker, 1965). As a result, the household maximizes its utility (1) subject to (6), (7) and (8).

Optimal amount of time and market goods and services are rationally chosen by parents in order to maximize their utility. It should be noted that marginal products of time and market goods and services in the production of child's human capital are positive and diminishing. In other words, increasing time and market goods and services increases child's quality at a decreasing rate. The assumptions are that:

(1) Household production function is linear homogeneous and same for all households,

(2) Child quality preference does not change with time,

(3) A child's quality is not produced jointly with other children in the household.

The demand for time and goods and services arise from the demand for C and K (Becker, 1965). The model is static in which the household make all decisions at one period of time (De Tray, 1974). Time devoted to work and home produced goods such as leisure and children are endogenous in the model.

According to Becker (1993), there is a tradeoff between quantity and quality of children. As the number of children in the family increases, parents invest less time to each child. On the contrary, parents who care more about the quality of children have fewer children in order to provide more investment to the child. In order to prove this statement, Becker gives the example of educated parents and parents living in rural areas in his book, *A Treatise on the Family*, published in 1993.

Parents with a higher educational level care more about the quality of children; therefore, they prefer to have fewer numbers of children. On the other hand; families living in the rural areas prefer to have large number of children.

Although men's time at housework has gradually increased in recent years, there is still an obvious sexual division of labor in household activities (Cohen, 2004). Women do the large part of housework although their labor force participation is increasing at the same time. Fathers have less responsibility at home and spend less time with their children (OECD, 2012). In other words, child care activity is obviously "gendered" (Gracia, Ghysels and Vercammen, 2011). Therefore, being man or woman is one of the determining characteristics of time allocation to work and to household chores.

Time allocated to household production and to work is endogenous in the model. An individual choose an optimal amount of time to various activities which maximizes his/her utility. However, human capital theory anticipates that parents with a higher educational level devote more time to market work, and less time to housework including child care due to higher price of time (Becker, 1981). Working parents spend more time outside of home and as a result, their child care time is expected to be lower than nonworking parents' child care time. However, work time might have no influence on the child care time. Better educated parents might spend more time with their children although they are more likely to work more. It might be the result of the higher awareness of them about the importance of investing time to their children (Blau, Ferber and Winkler, 2010; Gracia, Ghysels and Vercammen, 2011). They are much more conscious of the long term outcomes of time investment in children. They spend more time in the labor force but this does not necessarily mean that they should devote less time to their children. They prefer flexible working hours, or they sacrifice the time they devote to other activities like sleeping or leisure in order to spend more time with their children (Blau, Ferber and Winkler, 2010).

Moreover, flexibility of working hours might affect working parents' time allocation decision. Working in the private sector versus the public sector often

means more hours spent at work. Employment in the public or the private sector could explain the time allocation decision of parents although there is no study showing its effect on child care time (Gracia, Ghysels and Vercammen, 2011).

Another factor affecting parents' investment decision in their children is children's sex and ages. Parents invest goods and services, and time to each child at different amount due to children's different needs and parents' different beliefs and thoughts about child-rearing. Age of the child is an important determinant of how much time should be allocated to him/her. Babies and children at early ages are obviously more time consuming. The older the children are the less time parents are expected to devote to them. Additionally, some families think that daughters does not need education; therefore, their human capital is neglected (Becker, 1993). As a result, time devoted to daughters might be less than time devoted to sons. Therefore, sex and age of the child are expected to affect parents' time allocation to the child.

Wage rates might affect time spent on children. Therefore, it would be realistic to think that wage rates affect time allocation of individuals. If wage rates are high, individuals move away from time-intensive activities (Becker, 1993; Price, 2010). On the contrary, lower wage rates result in spending more time at work (Gratz, 2006) and therefore, less time in other activities. However, household activities vary and their marginal utility is not known. The effect of change in wages on childcare time is inconclusive in the theory.

2.2 Empirical Literature

As mentioned above, human capital theory anticipates that women with higher educational level devote more time to market work, and less time to housework including child care due to higher opportunity cost of time (Becker, 1981). The housework time of women tends to decrease due to their increasing labor force participation. Bianchi et al. (2008) study the changing time allocation of families in the U.S. using time use data from various years (1965, 1975, 1985 and 1995 and 1998-99 and 2000 by University of Maryland). This work investigates the

transformation of the U.S. families from a traditional structure in which men work and women perform housework to a neo-traditional family in which both partners work for pay and do housework. Although the labor force participation of women has increased sharply, women still perform the majority of housework and childcare compared to men. Nevertheless, the time that men devote to housework and childcare has increased. Over the years, the labor force participation of women has increased but childcare time of mothers who are working did not decrease. They do this by giving up their personal time and housework time. Investing in children is their priority. Moreover, fathers are more helpful in housework. They spend more time in childcare and assume more responsibility at home.

There are also many studies showing that university educated mothers devote more time to both market work and child care than other mothers. In order to investigate this contradiction, Craig (2006) uses the Australian Bureau of Statistics Time Use Survey in 1997. The sample she used includes parents between the ages of 25-54 and having at least one child under the age of 12. Australian case also contradicts with the theory. University graduated mothers in Australia spend more time in child care. She refers to this contradiction -less time devoted to housework and more time devoted to childcare by highly educated women- as "the modern female dilemma". Therefore, it is possible to say that classifying child care as housework is not meaningful especially for better educated women. Moreover, time spent in developmental child care is the highest among university educated parents. It means that parents with a higher educational level are more aware of the contribution of time spent with children to their development.

Haveman and Wolfe (1993) emphasize increasing concern about children in public policy debates. They worry about deterioration in the status of children due to increasing birth rates to unmarried teens, single mothers, divorcees, and increasing numbers of mothers in the labor force. They try to devise appropriate programs in order to prevent such deterioration. The authors question whether family-based investment or public investment can play a significant role in improving the status of children and conclude that they both are necessary and complementary. In terms of

parental investments, education of the parents -especially education of mothers- seems one of the most important determinants of children's success. Mothers with higher education are more likely to make decisions improving the quality of children and in order to improve it; they spend more time with their children. The study concludes that health care services, early childhood education programs, support for mother-only families and family-planning services provided by the government are some of the actions to be taken.

Guryan, Hurst and Kearney (2008) analyze parental time spent for child care in the U.S. using data from the American Time Use Survey between the years 2003-2006. The sample includes individuals between the ages of 21-55 and having at least one child under the age 18. They concluded that there is a positive relationship between parental education level and time spent with children in the U.S. Then, they investigate whether the results they get in the U.S. hold across the countries that include the U.K. (2000-2001), Palestine (1999-2000), Estonia (1999-2000), Germany (1991-1992), Italy (2002-2003), South Africa (2000), Norway (1990-1991), Netherlands (2000), Austria (1992), Canada (1998-1999), Slovenia (2000-2001), Chile (1999), France (1998-1999). The higher the GDP per capita, the more time parents spend on childcare. Despite of the demographic differences across countries, parental time spent on childcare and educational level of parents are found to be positively and significantly related for these countries.

Bonke and Esping-Andersen (2011) study the determinants of child care time of parents by using the Danish Time Use Survey of 2001. Their study coincides with others showing that educational level of parents is one of the key determinants. Parenting time differs sharply among parents with different educational level. Parents with a lower educational level spend less time with their children. Besides, the study uncovers the existence of two-way gendering in parenting. The first sort of gendering in parenting is that mothers spend more time with their children as compared to fathers and the second one is increasing childcare time of fathers when at least one son in the family exists. In addition to this, they also concluded that market productivity or labor supply of parents has no effect on the amount of care.

Sayer, Gauthier and Furstenberg (2004) examine whether the effects of parental education on time spent with children varies with family policy. They consider four countries, Canada, Germany, Italy and Norway, which have different welfare regimes. The sample consists of married mothers and fathers with children under the age of 18. They find that mothers with higher educational level spend more time with their children in all countries regardless of the policies, services or the level of supports by the state. On the contrary, family policies and support are more effective on fathers' time allocation. The effect of educational level of fathers on child care time becomes less significant when family supports and services are high.

Hill and Stafford (1980) investigate whether social class and the educational level of mothers have an impact on parental time with children using data from the Time Use Survey conducted in the years 1975-76 by Michigan University. The sample includes married women and men of ages of 18-50. They conclude that mothers with college education or more devote more time to children, especially to children aged 0-3, compared to less educated mothers. In order to spend more time with children, they cut down their personal care time and their leisure time. There is no finding on positive effects of fathers' higher educational level on childcare time; however, their educational level affects the childcare time of mothers. Wives with college educated husbands devote more time to childcare.

Leibowitz (1975) puts emphasis on the effect of women's educational level on their allocation of time at home and at work. In order to discuss its effects, Leibowitz uses three samples, the Cornell sample by Walker, Purdue sample by Manning and the French sample. The Cornell sample by Dr. Kathryn Walker from Cornell University collected time budgets of 1,296 couple families in New York in 1967-68. Time spent on household and other activities were recorded in 10-minute interval for two days. For daily activities such as meal preparation and laundry, women in the high education group - women who had gone beyond high school- spend less time compared to those in the low education group. On the other hand, they spend much more time in the labor market and in childcare. Husbands of better

educated women spend more time in all activities than husbands of the low education group. The Purdue sample is again a time-use survey for Indiana families in 1961-62. It concludes that childcare time is positively related with the education of wife. However, time inputs to other household activities fall with education. The French Sample is a study that collects time budgets in 15-minute intervals for both a weekday and weekend day for 174 Parisian families with working mothers. The results of the study are also consistent with the previous two studies. For both days, working women devote less time to daily household chores, and more time to childcare. Moreover, men's time increases in daily activities while women's time decreases in families with higher educated spouses.

Another study of Leibowitz (1977) uncovers the hidden side of the relationship between family's background features and its economic effects. She investigates the "mechanisms" that reflect parental characteristics' effect on economic variables. According to her, one of the most important mechanisms is the investment in human capital by parents. The hypothesis in her article is the existence of positive correlation between parents' time with children and children's verbal skills. In order to test it, she uses the *Sesame* data, collected by Educational Testing Service. The sample includes children between the ages of 3-5 in the fall of 1969 and summer of 1970. In order to measure children's verbal development, Peabody Picture Vocabulary Test is used. She finds that having fewer numbers of siblings contributes to the language development of children. On the other hand, full time or part time work of mothers has no effect. Moreover, she finds that the positive relation between mothers' educational level and her children's score in vocabulary test is through higher educational time investment of more educated mothers.

Gratz (2006) discusses the role of home background-especially parents' income and education- in children's education through time spent with children. The education of children starts at home and parents are their first teachers. Therefore, parents' personal and educational background cannot be ignored. As shown in many studies, Gratz also says that parents who at least graduated from high school spend more time with their children. By this way, they convey their knowledge to their

children and their reading levels and school achievements are much higher. Moreover, parents with lower incomes spend more time at work and less time with their children. Therefore, the economic background of the family is also important in the allocation of their time.

An interesting study belongs to Gimenez-Nadal and Molina (2013) which investigates the relationship between educational background of parents and educational childcare time by them. The sample they use includes couples with children under age 18 from Spain (2002) and the U.K. (2000), two European countries with different welfare regimes, from Multinational Time Use Study. Educational childcare is identified as reading to children, helping them with homework, playing with them and similar activities. According to Gimenez-Nadal and Molina, what really matters for the time devoted to educational child care by parents is mothers' educational level. Educational level of mothers has a positive impact on the time devoted to educational child care by mothers, and interestingly by fathers. The higher the educational level of mothers is, the more time fathers devote to educational childcare. On the contrary, education of fathers has no impact for either parent's time spent with their children.

Leibowitz (1974) proves that explaining IQ level through genetic factors is not adequate, home investment of mother is also essential. She uses the data set called the Terman sample. Terman used the sample of the students whose IQ levels are among the top 1 percent of the national IQ of California and collected data about students and their lives at home. Leibowitz aims to show that home investment is crucial even for children with high IQ level. It was a very comprehensive study including data about children's final schooling level, family income, parents' time spent with them, earnings and jobs held after many years. The study lasted for almost 40 years. The sample is so unique that it is not possible to be generalized to the whole population; however, the study concluded that parents' time is positively and significantly related to the final schooling level even for the very able children. Moreover, the characteristics of the mothers are much more effective on the

schooling level that girls achieved. An important finding is that mother's education has a strong effect on the IQ level of students.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Source of Data

In order to answer the research questions regarding the association of childcare time of parents with their educational level a quantitative approach is pursued. The data used is Time Use Survey of the Turkish Statistical Institute (TurkStat), covering the period 1 January-31 December 2006. The aim of the survey is to collect data on time-use of individuals in a day. The diary keeping method is used which asks respondents to record their activities during 24 hours in ten-minute time slots. Keeping a diary is more accurate than getting the information on time allocation through face to face interview. Demographic data is available for each member of the household of all ages but the diary was collected from those who are at the age 15 and above. There were two diaries for each person; one of them is for a weekday and the other is for a weekend day. Daily activities are grouped into:

- personal care,
- employment and job seeking,
- education,
- household and family care,
- voluntary work and meetings,
- social life and entertainment, sports,
- hobbies and games,
- mass media,
- travel and unspecified time use,
- sleeping.

Personal care time includes activities such as eating and taking a shower. Employment and job seeking cover working time in main or second job, job

interviews, reading job announcements etc. Education activities cover time spent in lessons at school or university, symposiums, doing homework, studying, courses on music, language courses etc. Household and family care concerns food preparation, cleaning, pet care, construction work, administration of household, childcare, and care for the elderly and the sick. Voluntary work and meetings include time spent in organizations, meetings, and in helping other households without receiving a payment in return. Social life and entertainment covers participation in social activities, celebrations, resting, and having a holiday, spending time in the library and the like. Hobbies and games are related to time spent on visual art, stage art, literary art, using a computer, surfing the internet, playing solo games, computer and video games. Mass media time includes time spent reading a book, press releases, listening to radio and music, watching TV. Travel and unspecified time use include travelling, the time spent to fill time use survey and other unspecified activities not included in the categories mentioned above.

The childcare time of parents includes physical care and control, time spent for the child's education and accompanying the child. Some examples of these activities are reading to and playing with children, attending parent-teacher meetings, breast-feeding, watching the child while he/she is playing etc.

The survey is carried out with approximately 390 households in each month so that over a 12-month period a total of 5070 households and 11815 individuals are interviewed. Only individuals aged 15 and over keep diaries. Including persons younger than 15, the survey covers 16413 individuals in total.

The operational sample includes nuclear families having at least one child under the age of 18.Extended households are excluded because it is not possible to find out with which child individuals spend time. Parents living in extended households may devote time to their nephews or grandchildren. Also, parental time is substituted by other family members. Therefore, only nuclear families are included. 2100 families are nucleus, which is almost 70% of the families in the dataset. Additionally, 78% of children (N=4204) live in a nuclear family. Of 4204 children, 1026 of them are younger than 3 years, which is almost 25% of all

children. The number of fathers and mothers are 1954 and 2082, respectively. 1816 of 1954 fathers and 1986 of 2082 mothers have kept a diary during a weekday and 1811 of fathers and 1983 of mothers have kept a diary during the weekend.

The main variable of interest in this study is the time devoted to childcare. The time diary data is the most common data source used to assess the effect of parental education on parental childcare time; nevertheless, using the quantity of childcare time as a measure of human capital investment may be problematic because it fails to take the quality of time and type of activity that the parent and the child are engaged in together. Educational activities like helping with homework, reading, playing and so on are expected to contribute to child development the most. Unfortunately it is not possible to determine the quality of time devoted to childcare through the time diary data of TurkStat due to lack of information on the type of activity engaged in. Nevertheless, there are many studies showing that parents with higher educational level do more educational activities with their children. De Garmo et al. (1999) show that basic socio-economic status indicators of parents are linked to their parenting practices; in other words, the parents with higher educational level perform better in parenting. Since the data does not allow testing it, I assume that the quality of time is higher for the parents with a higher educational level.

Additionally, the time spent with the child as a secondary activity for the parent is not specified in the survey. Parents who engage in some other activity except childcare may also engage in childcare at the same time. For instance, the parent who is cooking may watch the child while he/she is playing. However, time diary data does not present any information about the time during which parents are indirectly engaged with children.

Additionally, any information about childcare provided by someone outside the family is not available in the data. Childcare might be provided by paid care givers or some other family members living out of the household. This information would have been valuable in understanding the parental childcare time. These shortcomings must be kept in mind in the interpretation of the results.

3.2 Description of the Variables

In order to understand how parents' education might affect their childcare time allocation, an empirical model is constructed based on the theoretical model described earlier. The empirical model uses the elements of both parents' and families' characteristics. Using this model, the association between childcare time of parents and their educational level is investigated.

Three different models are used to predict mothers' and fathers' childcare time separately. The dependent variables in these models are childcare time in a week day per child, childcare time in a weekend day per child and average per child childcare time of the parent during the week. Average childcare time of parents is calculated by taking the average of time in a week day and a weekend day if childcare time for both days is positive. If not, the existing childcare time in any day is taken as the average childcare time.

The density functions of time spent by each parent are shown in Figure3.2.1. They contain observations that do not spend any direct time in child care; therefore, the distributions are right-skewed. These statistical characteristics should be taken into account seriously. Because their density curves are right-skewed, I prefer to use the log of dependent variables. By doing so, I get normal distribution at least for the parents who spend time on childcare (Figure3.2.2.). As a result, dependent variables are the log of average childcare time of the parent, the log of childcare time of the parent per child for a week day and for a weekend day. Since each parent has two diaries, I have six regressions in total.

In multivariate analyses as covariates, I consider parental and household characteristics. Parental characteristics include employment status, health status and age of the parents. Moreover, in order to see the effects of the spouse's characteristics on childcare time of the parent in question, the existence, employment status and educational level of the spouse are included.

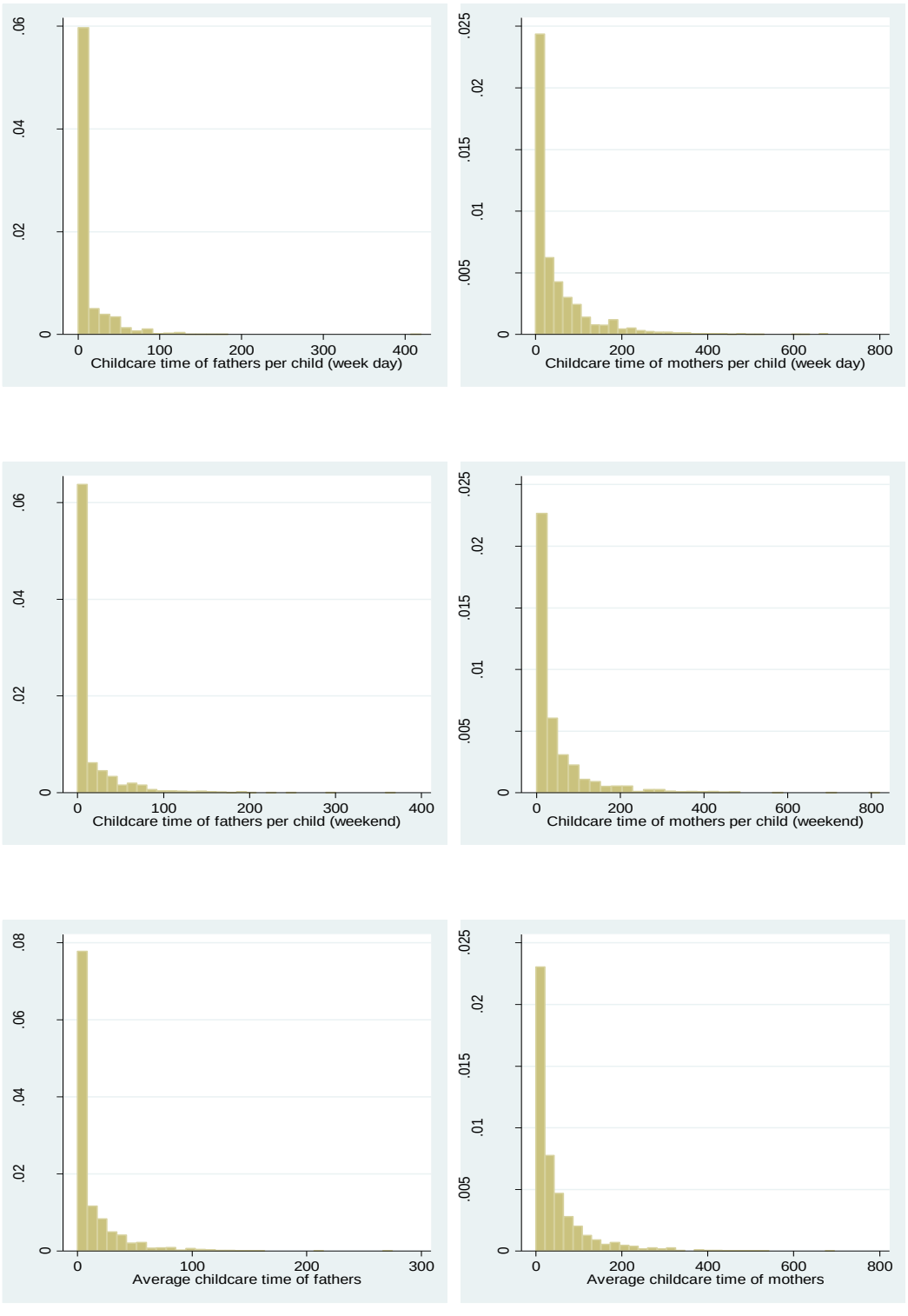

Figure 3.2.1. Childcare time of parents per child

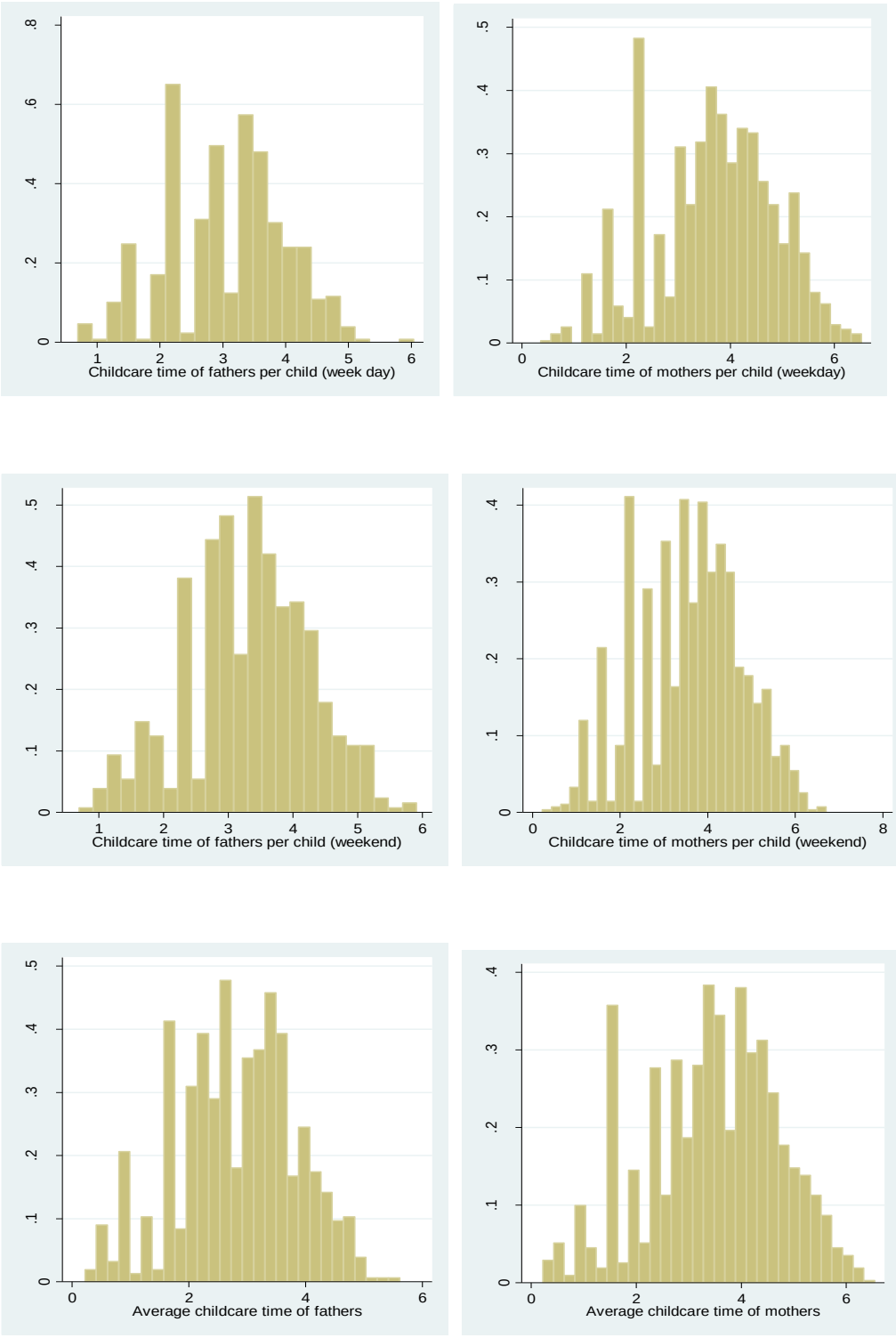

Figure 3.2.2. The log of childcare time of parents per child (time>0)

Employment status of parents is included as a dummy variable which is1 for employed individuals, and 0, otherwise. In order to see whether employment in the public or the private sector affects childcare time, a dummy variable taking the value of 1 for the parent employed in the public sector is included. Other three variables are related to the type of employment, i.e. whether the person is a wage earner, employed on his/her own account or as unpaid family worker. Their effects are tested due to their different flexibility of working hours. Therefore, the regression equation includes a public sector dummy, and wage earner and own account variables as separate dummies. Working as an unpaid family worker is the reference group for the latter.

Parental education, which is of primary interest for this study, is categorized into five groups; illiterate or those who have never gone to school, primary school graduates, secondary school graduates, high school, and university/college graduates or those with higher degrees. The illiterate are chosen as reference group. Parental age is a continuous variable and the square of parents' age is also added to see whether the relation between the age and childcare time of parents is linear or non-linear. The variable showing the health status of the parent is 1 for parents who state that their health status is good or very good, and 0 for those who state that it is bad or very bad.

Since the effect of characteristics of spouse is investigated in some studies discussed above (Hill and Stafford, 1980; Gimenez-Nadal and Molina, 2013), three variables related to spouse are included. Having a spouse in the household, his/her educational level and employment status are included in the model. According to the study of Kendig and Bianchi (2008),lone parents devote less time to their children due to increasing responsibilities in the household and economic concerns. Therefore, having a spouse in the household and sharing the responsibilities might determine their time allocation. Moreover, Gimenez-Nadal and Molina (2013) find the positive impact of mothers' educational level on fathers' childcare time. Therefore, educational level of spouse is included in the regressions. Additionally, the care of children can be much harder if the health of spouse is not good.

Unhealthy parent may also be in need of care, which affects time allocation of the individual. Childcare time of the parent is not given as time per child in the dataset. In other words, time allocated to each child is not given separately. However, the ages and sexes of children are given. In order to see their impact on childcare time of parents, children are classified into eight groups according to their ages and sexes (boys and girls at the ages of 0-2, 3-5, 6-14 and 15-17), and the ratio of number of girls and boys within these groups to total number of children in the family is included in the model. The reference group for children is girls aged 15-17.

The association between household characteristics and childcare time is also investigated. Families living in urban areas are mostly engaged in agriculture and as a result, they need more hands to work the land. They prefer to have large number of children instead of caring about the quality of children (Becker, 1993). Therefore, whether the household lives in rural or urban area is controlled for by including a dummy variable that takes the value of 1 if the household lives in a rural area and 0 otherwise. Rural areas are settlements with a population of 20000 persons or less.

The data include the income level of households in ten categories. In addition, in the data, information of household assets such as whether the household has a computer, refrigerator, cell phone, and video, automobile and so on is available. These consumer durables can be used to determine the wealth status of the household. Because of possible reporting and measurement errors in income data, I prefer using household assets in understanding the economic standing of the household. I do this by estimating a wealth index using principal component analysis. The possession of a home phone, cell phone, computer, internet connection, television, video, DVD, camera, refrigerator, deepfreeze, satellite, dish washer, microwave, washing machine, dryer, carpet washer, air conditioner, cable TV, second house, automobile, home size (1 if house area is higher than 140 m^2), and number of rooms in the household are used in predicting the wealth status of the household. The first component, which explains the largest part of the variation in the data, is chosen to represent the wealth of the household (Filmer and Pritchett, 2001; Sahn and Stifel, 2003; McKenzie, 2005). Then, households are ranked from

the poorest to the richest based on their wealth scores into five groups: bottom 20%, second 20%, third and fourth 20% and the top 20% in wealth and included in the model as separate dummies by taking the poorest 20% as the reference category.

3.3 Empirical Model Specification

Dealing with time use surveys poses some difficulties due to the presence of huge number of zeros for the time spent in many activities. There are many reasons of zero observations in the data. One of them is people who do not spend any time with given prices and income. The other one is people who do not spend any time independent of price and income (self-decision). First one refers to corner solutions while the second one shows non-participants (Eakins, 2016). When the dependent variable has large number of zeros, OLS does not provide consistent parameter estimates (Cameron and Trivedi, 2009). Due to existence of huge number of zero values of time spent in child care, either Tobit or double hurdle models are typically used in the literature in order to analyze the factors determining childcare time allocation of parents.

The Tobit model is introduced by Tobin in 1958 and developed for cases in which the dependent variable is censored or truncated at a certain point or interval (Stewart, 2013). According to Burke (2009), the likelihood function of the tobit model is:

$$f(y|x_1) = \{1- \varphi (x_1 \beta/\sigma)\}^{1(y=0)} [(2\pi)^{-1/2}\sigma^{-1} \exp\{-(y-x_1 \beta)^2/2\sigma^2\}]^{1(y>0)} \quad (9)$$

where φ represents the standard normal cumulative distribution function and 1(y=0) and 1(y>0) are exponential indicator functions. After fitting a Tobit model, the probability that y is zero or positive, the expected value of y which is conditional on spending time with children and unconditional expected value of y can be estimated. However, it assumes that the same stochastic process (β from the equation above) determines both the amount of time (expected value of y) and the decision to devote time (the probability that y is positive) (Blundell and Meghir, 1987).

Another drawback of the Tobit model is that zero observations of the dependent variable are assumed to represent the corner solution. According to this assumption, childcare time of parents is zero because they do not spend any time with given prices and income. In other words, it assumes that zero observations only arise due to economic reasons of individuals (Del Saz-Salazar and Rausell-Köster, 2007); therefore, it restrains the researcher from estimating other determinants of zero observations (Blundell and Meghir, 1987). This assumption clearly restricts the researcher to determine other reasons of zero observations. Due to its limitations, some generalizations to the Tobit model have been developed and one of them is the double hurdle model. The double hurdle model is originally based on the work of Cragg (1971). Cragg's two tier model, or double hurdle model, highlights the existence of two stages of time allocation decision. First one is the decision of whether or not to spend time for the activity, and second one is, if you spend, how much time to spend on it. The model is as follows (Burke, 2009):

$$f(w, y \mid x_1, x_2) = \{1- \varphi(x_1 \gamma)\}^{1(w=0)} [\varphi(x_1 \gamma)(2\pi)^{-1/2} \sigma^{-1} \exp\{-(y-x_2 \beta)^2/ 2\sigma^2\}/ \varphi(x_2 \beta/ \sigma)]^{1(w=1)} \quad (10)$$

where w is 1 if y is positive and 0 otherwise. While the Tobit model assumes that the same stochastic process determines the value of these two stages, the double hurdle model allows the selection and outcome processes to be separate. The vector of γ represents the probability to spend time and the vector of β represents the amount of time. Moreover, x_1 and x_2 are independent of each other. In other words, each stage may be determined by different vectors of explanatory variables. Thus, double hurdle model allows the researcher to determine the factors affecting the participation decision and the factors affecting the intensity of the activity separately.

Similar to the Tobit model, the probability that y is zero or positive, the expected value of y which is conditional on spending time with children and unconditional expected value of y can be estimated after the double hurdle model.

The partial effect of an independent variable on the probability that y is positive is (Burke, 2009):

$$\frac{\partial P(y>0 \mid x_1)}{\partial x_j} = \gamma_j \varphi(x_1 \gamma) \quad (11)$$

where γ_j represents the coefficient on x_j. The partial effect of an independent variable on expected value of y, conditional on the fact that y is positive is (Burke, 2009):

$$\frac{\partial T(y_i \mid y_i>0, x_{2i})}{\partial x_j} = \beta_j [1 \ \lambda (x_2 \beta / \sigma)\{ x_2 \beta / \sigma \ + \ \lambda (x_2 \beta / \sigma)\}] \quad (12)$$

where βj is the coefficient on x_j.

Based on the works of Blundell and Meghir (1987) and Newman et al (2003), the double hurdle model can be written as follows:

$$Q_i = D_i \mu + v_i \quad (13)$$

$$y_i^* = X_i \beta + e_i \quad (14)$$

$$y_i = y_i^* \text{ if } y_i^*>0 \text{ and } Q_i=1 \quad (15)$$

$$y_i = 0 \text{ otherwise} \quad (16)$$

Equation 13shows the participation decision of individuals; therefore, Q, latent exogenous variable, takes the value of 0 or 1.$D_i$is a set of the variables assumed to affect the participation decision of individuals. Equation 14 shows the amount decision of individuals. In this case, it shows the effects of variables (X_i) on time amount allocated to childcare. y_i equals to y_i^* (latent variable) only if individuals participate in the activity and spend some time.v_i and e_i are independent, homoscedastic, normally distributed error terms.

Under the assumption of independence of error terms (v_i and e_i), double hurdle model contains a probit model as the first stage and truncated regression on positive values of dependent variable as the second stage in itself (Wodjao, 2007).

In order to decide whether a tobit or a double hurdle model is more appropriate, a log-likelihood ratio test is performed. Log-likelihood ratio test rejects

the Tobit model in favor of the two-part model (chisquare=902.461). In other words, the test suggests that the two-part model performs better than the Tobit model.

3.4 Descriptive Statistics

The direct childcare time of parents in a day is 79 minutes for mothers and 20 minutes for fathers on average. The time is much lower for mothers in some European countries according to Eurostat (2004). For example, childcare time of women in Belgium is 35 minutes; 34 minutes in Norway and 33 minutes in the U.K. On the other hand, it is more or less same for fathers in European countries. It is 19 minutes in Belgium, 17 minutes in Norway and 12 minutes in the U.K. In order to understand this big difference between the time of mothers in Turkey and in other European countries, the time allocation of them to children up to 6 and to children aged between 7 and 17 are analyzed. While the time devoted to children younger than 6 is almost the same (2 hours and 14 minutes in Turkey, 1 hour 54 minutes in Belgium, 2 hours 17 minutes in Norway and 2 hours 22 minutes in the U.K.), the time devoted to children aged between 7 and 17 is much higher in Turkey (55 minutes). However, it is 28 minutes in Norway, 32 minutes in Belgium and 26 minutes in the U.K. In short, mothers spend more time with their children compared to European countries because they devote more time to older children than European mothers.

Table 3.4.1 shows the average minutes of fathers and mothers devoted to each activity in a weekday and a weekend day inclusive of those who do not spend time in a given activity. The values in parentheses are standard deviations. Fathers spend 10 minutes (sd=24.09) per child in a weekday on average while it is 50 minutes (sd=77.67) per child in a weekday for mothers. Childcare time of parents changes in opposite way during the weekend. While the average time per child fathers spend with their children increases on weekends, mothers' time decreases (14 minutes for fathers and 46 minutes for mothers). According to t-test results, the

difference between the time spent in a week day and in a weekend day is statistically significant for both fathers and mothers. While mothers spend more time with their children in a weekday, fathers' time increases during the weekends.

Table 3.4.1. Average minutes of parents for each activity

Activities	**MEN**		**WOMEN**	
	Weekday	Weekend	Weekday	Weekend
Personal care	161.60	168.47	150.27	154.29
	(73.67)	(73.79)	(62.70)	(61.75)
Employment	398.29	264.08	64.40	40.22
	(245.12)	(272.47)	(161.63)	(125.81)
Education	1.72	1.12	1.95	1.43
	(20.76)	(15.59)	(19.48)	(19.71)
Household & family care	46.36	66.90	398.83	404.12
	(74.44)	(93.90)	(174.17)	(176.76)
Childcare	16.96	22.40	81.76	76.16
	(34.59)	(44.95)	(102.41)	(104.48)
Childcare per child	10.24	13.94	50.01	45.89
	(24.09)	(31.85)	(77.67)	(76.89)
Voluntary work & meetings	32.02	34.51	43.10	42.00
	(66.43)	(74.44)	(77.82)	(75.11)
Social life & entertainment	79.28	110.85	109.42	114.53
	(99.53)	(117.54)	(101.80)	(110.99)
Sports	5.25	7.59	2.60	4.05
	(28.97)	(34.33)	(15.84)	(22.55)
Hobbies & games	14.98	19.89	2.61	2.98
	(50.75)	(61.08)	(17.33)	(19.19)
Mass media	121.80	149.20	122.39	111.11
	(101.77)	(121.67)	(101.87)	(98.72)
Travel & unspecified time use	107.24	105.42	56.44	53.32
	(90.11)	(90.79)	(70.42)	(71.70)
Sleep	471.40	511.92	487.93	511.89
	(103.63)	(133.07)	(106.37)	(116.65)
	N=1816	N=1811	N=1986	N=1983

Childcare activity is thought to be gendered and t-test results show that it is. For both days of the week, the difference between childcare time of fathers and mothers is statistically significant at conventional levels (p=0.000). It means that mothers devote more time to their children as Gracia, Ghysels and Vercammen (2011) and Craig (2006) find. Moreover, the studies of Raley and Bianchi (2006) and Mammen (2011) suggest that fathers' time in childcare activities are higher if they have sons. Since time allocated to each child is not given separately, I cannot investigate it for all families in the sample. Instead, I analyze single-child families to see whether having an only son or daughter changes the time allocation of parents. The average time of fathers in a day is 18.677 minutes (sd=30.299) for their daughter and 19.944 minutes (sd=34.817) for their son. On the other hand, average time of mothers in a day is 79.682 minutes (sd=109.947) for daughters and 80.179 minutes (sd=107.384) for sons. T-test results shows that the difference between time devoted to the daughter and the son is not statistically significant for either parent (p= 0.367 for fathers and p=0.994 for mothers) in single-child families. These results suggest that at least in single-child families the gender of the child does not determine the childcare time allocation decision of parents in Turkey.

It is a well-known fact that babies and children at early ages are more time consuming. The younger the child is, the more time parents are expected to devote to them. Therefore, childcare time of parents who have children with the ages between 0-2 is compared with childcare time of parents who do not have any child with the ages between 0-2. The table below shows the results (Table 3.4.2). Childcare time of both parents is much more if they have a child younger than 3 years old. The results show that women spend more than 3 hours in a day if the child is younger than 3 whereas men spend less than one hour. Although fathers' time increases on weekends, it is still much lower than direct childcare time of mothers. Again, when I test the effect of sex of the babies on childcare time of parents in single-child families, t-test results show that there is no statistically significant difference between the time devoted to boys and girls younger than 3 (p=0.792 for fathers and p= 0.817 for mothers).

Table 3.4.2. Childcare time of parents who have a child with the ages between 0-2 and who do not have

	Childcare time of parents who do not have any child with the ages between 0-2		Childcare time of parents who have one child with the ages between 0-2	
	Mother	Father	Mother	Father
Week day	32.107 (51.007) N=1565	8.511 (22.030) N=1416	209.021 (135.534) N=148	31.068 (38.668) N=142
Weekend	27.943 (46.220) N=1563	10.774 (26.703) N=1411	203.822 (145.013) N=147	47.352 (58.298) N=141

Since educational level of parents is of primary interest of the study, I analyze their time allocation in various activities. First one is their childcare time allocation. Both Table 3.4.3 and Figure 3.4.1 show the average minutes of parents per child according to their educational level. It only takes into account parents whose childcare time is positive. There is an overall upward trend in childcare time of parents with higher educational level. However, the increase in childcare time of mothers is monotone neither for a weekday nor for a weekend day. The childcare time of secondary school graduated mothers is almost double the amount of childcare time of primary school graduated mothers, but it stays stable, even decreases for mothers who are graduates of secondary school or higher. Nevertheless, childcare time of mothers who are secondary school graduates or higher is much higher than illiterate mothers. When we look at the childcare time of fathers, it increases with their educational level. While it is only 17 minutes for illiterate fathers on weekdays, it is 42 minutes for university graduates or higher.

Table 3.4.3. Average parental time in minutes in a day per child according to their educational level (time>0)

Educational level	Fathers		Mothers	
	Weekday	Weekend	Weekday	Weekend
Illiterate	17.16	23.21	45.76	43.54
	(14.46)	(33.15)	(67.83)	(66.40)
	N=23	N=22	N=226	N=224
Primary school	33.82	35.63	59.46	57.47
	(37.75)	(34.40)	(65.93)	(69.11)
	N=220	N=228	N=713	N=664
Secondary school	28.34	43.01	113.17	104.45
	(22.96)	(42.41)	(98.58)	(100.50)
	N=88	N=87	N=143	N=144
High school	33.15	46.45	104.75	101.72
	(28.68)	(41.45)	(114.80)	(110.77)
	N=144	N=153	N=201	N=197
College and higher	42.50	59.07	102.59	99.15
	(34.07)	(59.90)	(90.85)	(102.41)
	N=80	N=101	N=92	N=85

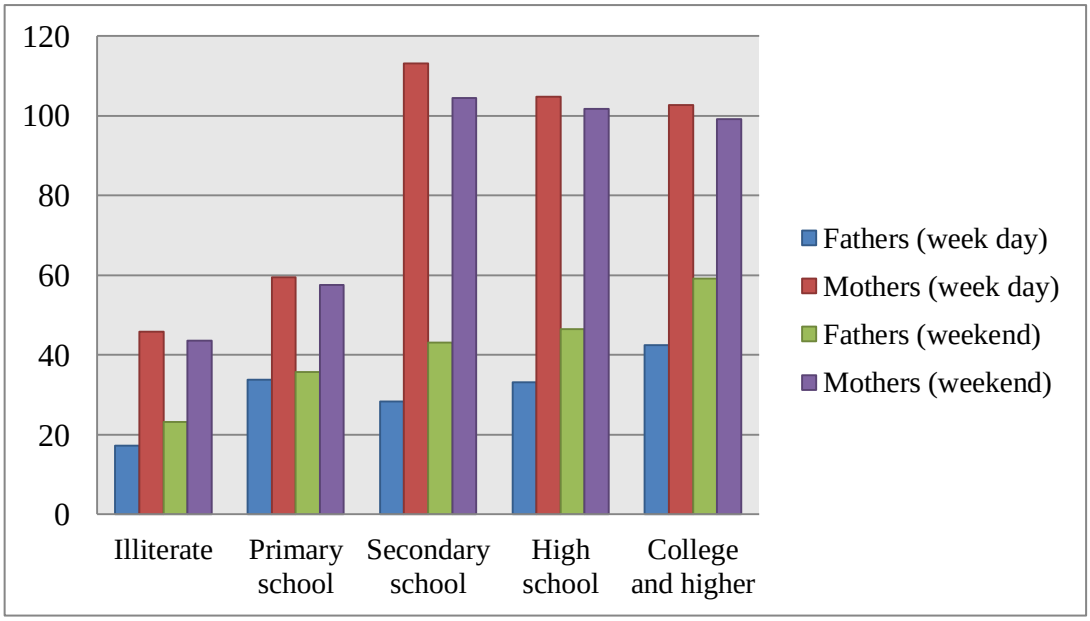

Figure 3.4.1. Childcare time per child according to parental education level (time>0)

According to 2003-2006 waves of the American Time Use Survey, childcare time of women per child is 5.5 hours per week for mothers whose schooling is less than 12 years. However, it is 7 hours per week for mothers with the schooling level between 13-15 years. It is much higher for mothers whose schooling level is higher than 15 years. They devote 9.4 hours per week per child (Guryan, Hurst and Kearney, 2008). Compared to the Turkish case, childcare time of mothers in the U.S. is much lower. Nevertheless, childcare time of mothers increases with their educational level in both cases.

Secondly, I analyze time allocation of parents to various activities. These are work time, housework time, personal care time, leisure time and sleeping time of parents according to their education level. Since working hours are given weekly, I report time allocated to work in hours per week. Before discussing work time of parents according to their educational level, I analyze childcare time of parents according to their employment status. Table 3.4.4 shows the mean value of childcare time of each parent.

Table 3.4.4. Childcare time of parents according to their employment status (in minutes)

	MEN		WOMEN	
	weekday	weekend	weekday	weekend
Non-employing	8.706	9.304	56.621	51.135
	(20.544)	(25.878)	(84.514)	(83.019)
	N=197	N=197	N=1497	N=1495
Employing	10.434	14.508	29.786	29.853
	(24.493)	(32.474)	(45.836)	(50.752)
	N=1619	N=1614	N=489	N=488

It is found that non-working mothers devote more time to their children in both the week days and weekends (p=0.000). On the other hand, the difference between childcare time of working and nonworking fathers is not statistically

significant for weekdays (p=0.342). However, it is statistically significant on weekends at 5% significance level (p=0.030). Unlike mothers, employment increases childcare time of fathers. Employed fathers devote more time to their children compared to non-employed counterparts.

Now, I investigate the work time of employed parents according to their educational level. Figure 3.4.2 shows the hours allocated to work in a week according to the educational level of parents. As represented in the figure, work time of fathers is increasing until the graduates of secondary school. After secondary school, their work time is decreasing. On the other hand, mothers' work time is almost same until university or higher education level. Work time is the highest for mothers graduate from university or higher.

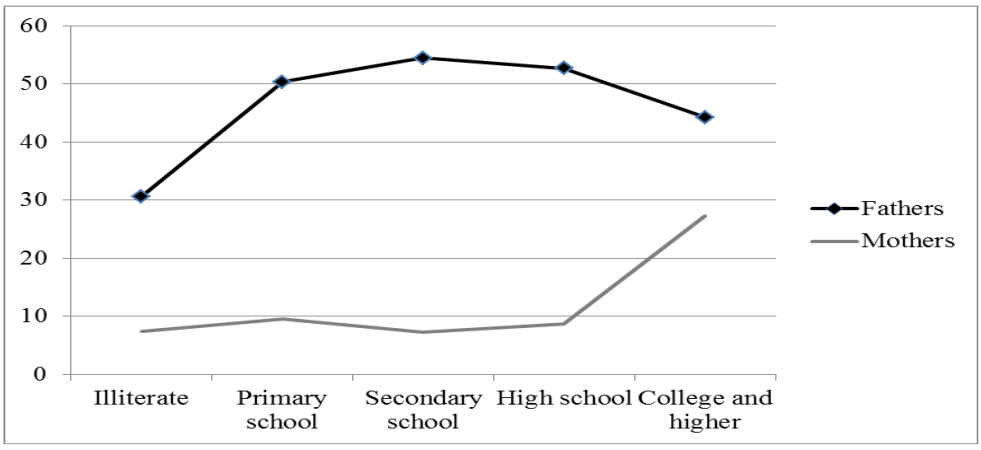

Figure 3.4.2. Weekly work time (hours) of employing parents

Next, I move to discussing how the allocation of housework time of mothers and fathers changes with their education level. Table 3.4.5 shows the average time devoted to each activity according to educational level of each parent and standard deviations. Additionally, Figure 3.4.3 is used in order to show the changes clearer. Here, Panel A of Table 3.4.5 shows housework time of parents which excludes

childcare time of parents. Housework time of fathers is 31 minutes (sd=66.947) on weekdays and 45 minutes (sd=78.569) on weekends. On the other hand, housework time of mothers is much higher. It is 5 hours and 17 minutes (sd=144.889) on weekdays and 5 hours and 27 minutes (sd=147.948) on weekends. Housework time of fathers decreases on weekdays, but increases on weekends when their educational level increases. But it is still much below the housework time of mothers at all levels of education. This is in accordance with the findings of Cohen (2004) and Bianchi et al (2008). Even if men participate in housework activities, the time allocated to it is very low. Still, large part of housework is done by women. On the other hand, housework time of women falls monotonically on both days with increasing years of schooling. Time used in home production might be substituted with goods and services provided in the market because the cost of time for mothers who are better educated and working is higher. Therefore, they might prefer housekeepers for housework instead of spending more time doing housework (Becker, 1965).

Personal care time includes time spent for eating, taking a shower, putting make up on etc. Panel B of Table 3.4.5 shows personal care time of parents according to their educational level. Personal care time of fathers and mothers are 2 hours and 42 minutes (sd=73.716) and 2 hours 30 minutes (sd=62.045) on weekdays, 2 hours and 48 minutes (sd=73.556) and 2 hours 34 minutes (sd=61.832) on weekends. An association between educational level and personal care time is not observed. Both for fathers and mothers it fluctuates around 150-160 minute level in a day. Since personal care is not something that can be substituted or provided in the market, it might not be associated with educational level or employment level of individuals. However, personal care time of mothers is below the time of fathers at all educational levels. Fathers devote more time to their care than mothers. For example, men who are secondary school graduates spend almost 3 hours on personal care on weekdays. On the other hand, women at the same educational level spend 2 hours 21 minutes.

Table 3.4.5. Time allocation of parents according to their education level

	Panel A. Housework time (except childcare)				Panel B. Personal care time			
	FATHERS		MOTHERS		FATHERS		MOTHERS	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
Illiterate	43.092	33.954	335.744	341.649	158.276	158.486	151.103	154.607
	(84.440)	(83.658)	(156.094)	(166.709)	(60.771)	(62.975)	(63.792)	(62.023)
Primary school	29.562	39.016	328.943	337.740	162.561	170.254	151.068	154.382
	(66.935)	(83.339)	(139.228)	(144.431)	(71.632)	(73.584)	(65.671)	(62.232)
Secondary school	25.824	45.114	318.026	319.410	173.57	176.604	140.682	151.89
	(57.845)	(72.495)	(132.965)	(138.694)	(78.998)	(74.333)	(54.249)	(53.392)
High school	22.512	47.064	291.415	298.622	154.896	166.47	153.876	152.44
	(51.087)	(73.238)	(125.510)	(140.167)	(78.447)	(76.685)	(58.295)	(61.055)
College and higher	38.772	66.182	200.745	274.582	156.764	159.877	146.643	161.023
	(63.637)	(77.172)	(124.715)	(132.445)	(70.348)	(72.747)	(52.773)	(71.108)
	Panel C. Sleeping time				Panel D. Leisure time			
	FATHERS		MOTHERS		FATHERS		MOTHERS	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
Illiterate	512.637	535.126	492.921	508.97	467.324	516.112	364.228	341.132
	(119.741)	(123.302)	(106.963)	(112.378)	(200.691)	(214.626)	(162.753)	(170.903)
Primary school	474.107	503.263	486.777	505.946	361.826	406.358	335.391	323.83
	(105.992)	(139.171)	(105.852)	(113.108)	(199.413)	(205.717)	(150.324)	(155.643)
Secondary school	467.369	505.136	492.748	502.438	344.792	441.297	317.655	323.487
	(100.844)	(131.482)	(110.735)	(129.051)	(187.882)	(203.866)	(154.664)	(163.306)
High school	458.13	516.154	490.438	536.491	319.351	403.059	327.136	328.276
	(99.616)	(127.045)	(110.676)	(119.142)	(160.257)	(193.522)	(160.515)	(164.165)
College and higher	469.171	535.525	466.107	532.307	396.676	494.013	303.384	326.737
	(90.275)	(121.669)	(87.669)	(127.823)	(194.236)	(182.450)	(144.393)	(155.376)

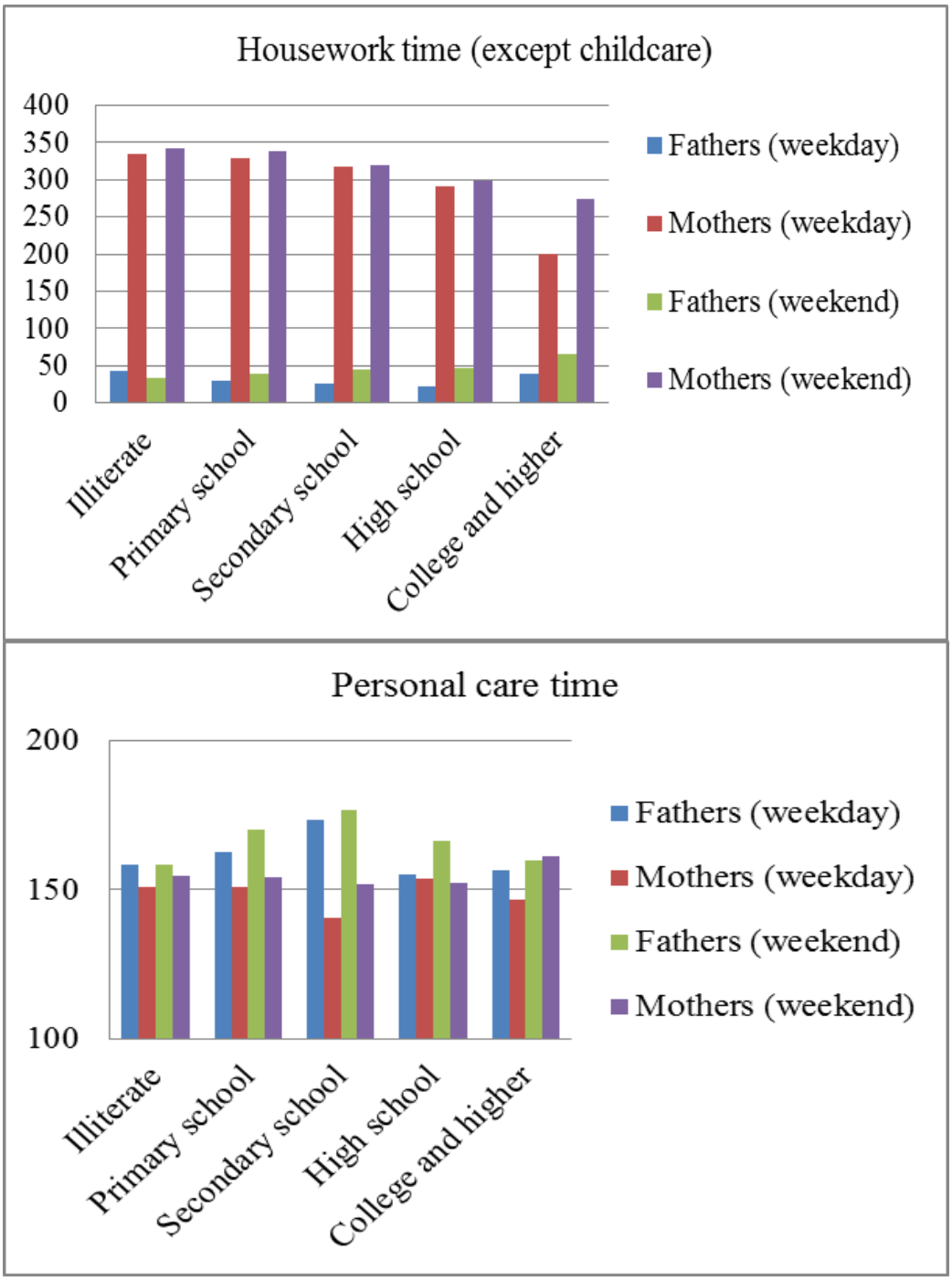

Figure 3.4.3. Parental time allocation to various activities in a day (in minutes)

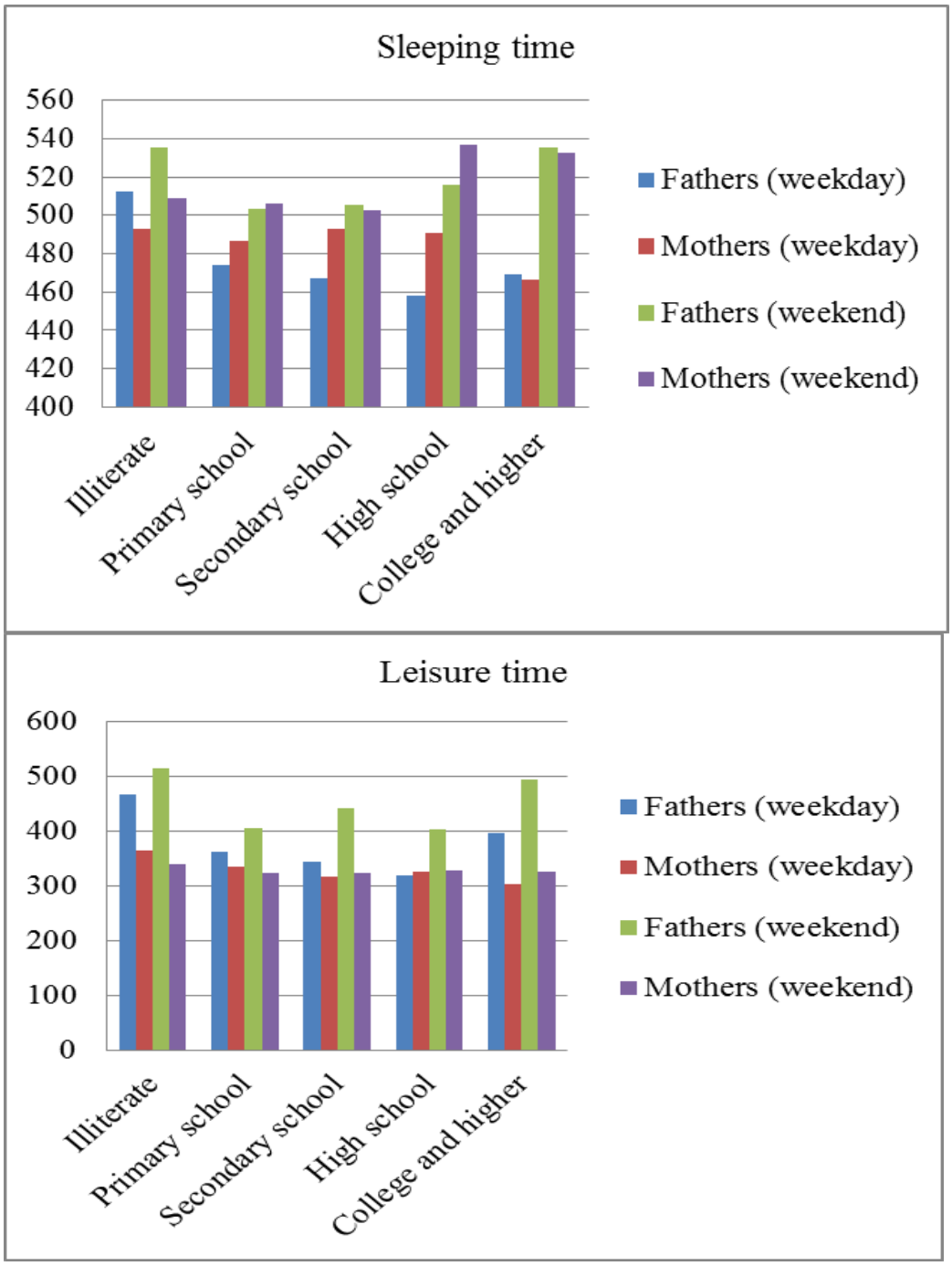

Figure 3.4.3. Parental time allocation to various activities in a day (continued)

The sleeping time of parents differ depending on whether it is a weekday or weekend day. Compared to the weekends, sleeping time of parents is low on weekdays. While it is 7 hours 53 minutes for fathers and 8 hours for mothers on weekdays, it is 8 hours 31 minutes for both on weekends. It reaches the lowest level for university graduate mothers and fathers who are graduates of high school on week days. It is probably because of spending more time at work. Additionally, it is at the lowest level for primary school graduate fathers and secondary school graduate mothers on weekends. Lastly, leisure time of parents is investigated in Panel D of Table 3.4.5. While it is almost 5 hours and 30 minutes for mothers on both days, it is 6 hours on weekdays and 7 hours 14 minutes on weekends for fathers. In other words, fathers devote more time to spare time activities than mothers. While leisure time of fathers seems unrelated to educational level, it is not so for mothers. Especially, leisure time of mothers sharply decreases on weekdays as mothers' education level increases.

Figure 3.4.4 shows the time devoted to different activities by mothers and fathers in a single figure which allows us to see in a more succinct way the pattern of time use. They are the average of time allocated to the activity on a day of workweek and on a day of the weekend. While time at work is denominated hourly, other activities are denominated in minutes. As educational level of fathers increase, childcare time of them slightly increases. As shown in the figure, housework time of fathers increases in parallel to childcare time of fathers. In order to increase them, it seems that they give up their leisure and work time as their education level raises. On the other hand, childcare time of mothers is not monotonically increasing with their schooling. The time of mothers graduated from secondary school peaks. Even if it slightly decreases after secondary school, it is higher compared to illiterate mothers or primary school graduates. As discussed above, work time is the highest among the mothers graduated from university or higher. The higher educational level they have, the less time they devote to housework and leisure. As Blau, Ferber and Winkler (2010) suggest, they sacrifice the time they devote to other activities

like housework and leisure in order to spend more time with their children. To conclude, it is possible to say that childcare is categorized as housework for fathers. Time devoted to these activities shows similar patterns. They both increase as fathers get higher level of education. However, as human capital theory suggests, categorizing the childcare as housework for mothers seems wrong. As shown in the figure, housework time and childcare time of mothers do not move together.

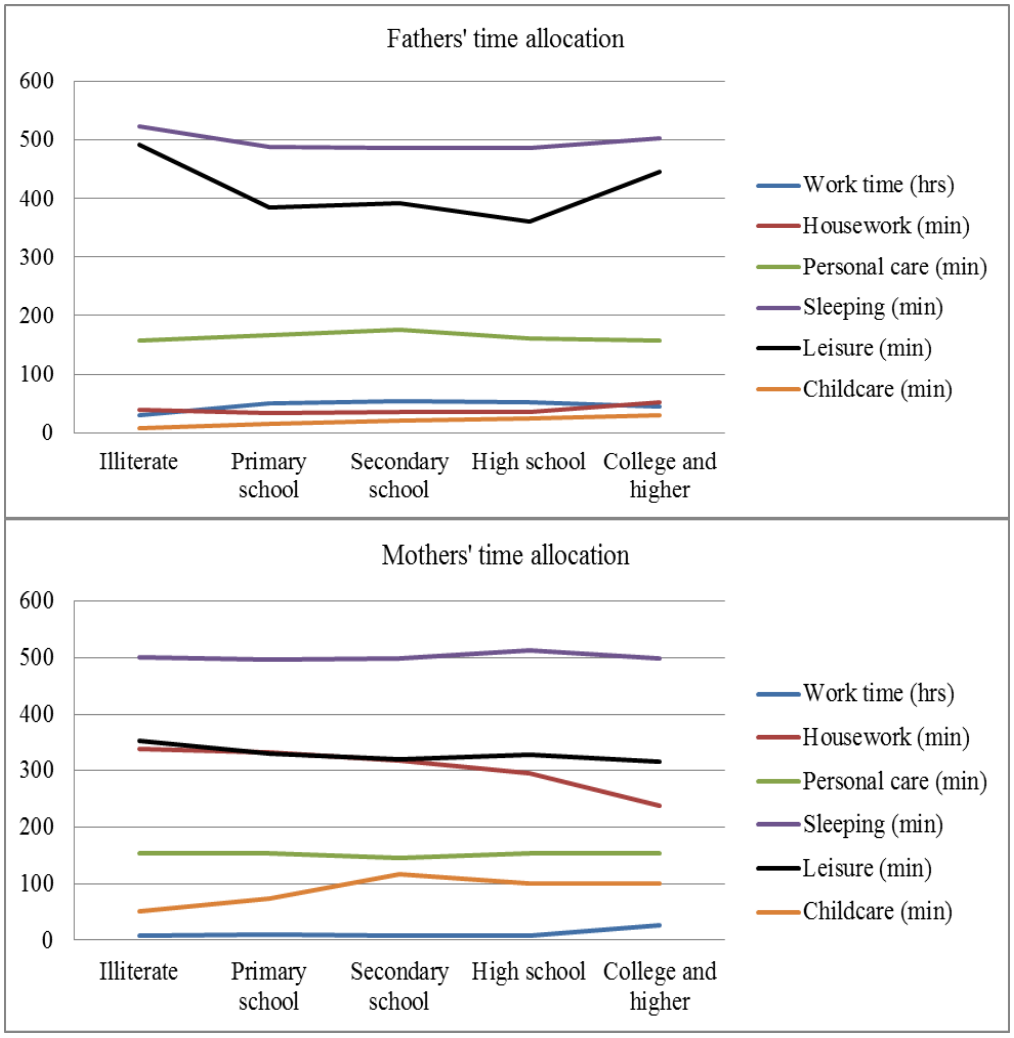

Figure 3.4.4. Time allocation of parents

As mentioned above, zeros are the main problem of the studies using time use surveys. 69% of fathers who kept a diary in weekdays and 67% of fathers who kept a diary in weekends do not devote any direct time to their children. On the other hand, 31% of mothers who kept a diary on weekdays and 34% of mothers who kept a diary on weekends do not spend any direct time with their children. Of the 1803 fathers and 1978 mothers who have kept diaries for both days, 999 of fathers, who make up 55% of those who kept a diary in both days and 460 of mothers -23%- do not devote any direct childcare time to their children in either of the two days. However, it does not necessarily mean that they never devote time to their children. As noted earlier, childcare as secondary activity is not observable in the dataset. As a result, huge number of zeros is not unexpected for the dataset used. Another thing is that age of children is a crucial determinant of childcare time of parents (Datcher-Loury, 1988). Parents who do not devote any direct time might have older children. Table 3.4.6 shows the age and sex distribution of children whose parents do not devote any direct childcare time to them. The results suggest that they are mostly children who are older in age as expected. Of the fathers who do not devote any direct time to childcare, 7.7 percent have children between the ages of 0-2 but 25 percent of them have children between the ages of 15-17.On the other hand, of the mothers who do not devote any direct time to childcare, only 2.6 percent have children between the ages of 0-2.

As noted earlier, the sample studied in this thesis is restricted to a sample of nuclear families having at least one child under the age of 18. Descriptive statistics for the log of childcare time of parents (the dependent variables) as well as independent variables for the pooled sample used in the empirical analysis are given in Table 3.4.7. The sample consists of young families. Besides, more than 95% of fathers and mothers are currently married. While almost 90% of fathers are working, only 22% of mothers are working. On the other hand, 75% of nonworking women state that they are engaged in household chores. It should be noted that this employment status of individuals is self-assessed.

Table 3.4.6. Percentage of children whose parents do not spend any childcare time

	Fathers	Mothers
0-2 aged girl	0.038	0.021
	(0.154)	(0.121)
3-5 aged girl	0.067	0.029
	(0.197)	(0.136)
6-14 aged girl	0.256	0.232
	(0.335)	(0.348)
15-17 aged girl	0.109	0.185
	(0.265)	(0.342)
0-2 aged boy	0.039	0.005
	(0.160)	(0.047)
3-5 aged boy	0.063	0.025
	(0.197)	(0.135)
6-14 aged boy	0.285	0.262
	(0.349)	(0.366)
15-17 aged boy	0.139	0.236
	(0.306)	(0.386)
	N=999	N=460

When it comes to the educational profile of the parents of children, 7% of men are illiterate or have never gone to school, 47% are graduates of primary school, 14% of secondary school and 20% of high school. Only 12% of men have graduated from a college or have a higher education degree. The average educational level of women is lower than that of men. 20% of women are illiterate or have never gone to school. 51% of women are graduates of primary school, 9% of secondary school and 16% of high school. Only 6% of women have graduated from a college or have a higher education degree That is, almost half of the parents of children are only primary school graduates. The fact is that educational level of parents is not high.

Table 3.4.7. Descriptive Statistics

	MEN			WOMEN		
	N	Mean	Sd	N	Mean	Sd
Dependent variables						
Log of Childcare time per child (weekday)	1816	0.95	(1.52)	1986	2.54	(1.95)
Log of Childcare time per child (weekend)	1811	1.08	(1.65)	1983	2.39	(1.96)
Log of Average Childcare time per child	1824	1.25	(1.56)	1991	2.65	(1.83)
Explanatory Variables						
Age	1954	39.382	(8.905)	2082	36.021	(8.767)
Agesquared/100	1954	16.302	(7.943)	2082	13.743	(7.474)
Illiterate/never gone to school*	1954	0.055	(0.228)	2082	0.190	(0.392)
Primary school	1954	0.434	(0.495)	2082	0.492	(0.500)
Secondary school	1954	0.136	(0.342)	2082	0.088	(0.283)
High school	1954	0.198	(0.398)	2082	0.133	(0.339)
University/college or higher	1954	0.109	(0.312)	2082	0.052	(0.221)
Being healthy	1824	0.787	(0.409)	1991	0.736	(0.440)
Employed	1824	0.906	(0.297)	1991	0.238	(0.425)
Work time (average hrs per week)	1954	49.161	(22.42)	2082	9.683	(19.49)
Public sector employment	1824	0.157	(0.363)	1991	0.043	(0.202)
Wage earner	1824	0.605	(0.488)	1991	0.117	(0.322)
Own Account Work	1824	0.299	(0.457)	1991	0.049	(0.215)
Unpaid family worker*	1824	0.002	(0.048)	1991	0.072	(0.258)
Ratio of 0-2 yrs old girls to all children	1954	0.076	(0.228)	2082	0.069	(0.215)
Ratio of 3-5 yrs old girls to all children	1954	0.089	(0.226)	2082	0.082	(0.216)
Ratio of 6-14 yrs old girls to all children	1954	0.239	(0.322)	2082	0.245	(0.325)
Ratio of 15-17 yrs old girls to all children*	1954	0.073	(0.219)	2082	0.082	(0.230)

Table 3.4.7. Descriptive Statistics (Continued)

Ratio of 0-2 yrs old boys to all children	1954	0.078	(0.233)	2082	0.068	(0.219)
Ratio of 3-5 yrs old boys to all children	1954	0.095	(0.240)	2082	0.089	(0.231)
Ratio of 6-14 yrs old boys to all children	1954	0.260	(0.334)	2082	0.271	(0.339)
Ratio of 15-17 yrs old boys to all children	1954	0.089	(0.249)	2082	0.094	(0.255)
Lowest 20% in Wealth (the poorest)*	1954	0.181	(0.385)	2082	0.189	(0.391)
2nd 20% in Wealth	1954	0.183	(0.386)	2082	0.181	(0.385)
3rd 20% in Wealth (moderate)	1954	0.183	(0.387)	2082	0.183	(0.386)
4th 20% in Wealth	1954	0.203	(0.402)	2082	0.197	(0.397)
Top 20% in Wealth (the richest)	1954	0.249	(0.432)	2082	0.250	(0.433)
Rural	1954	0.306	(0.460)	2082	0.312	(0.463)
Having spouse in the household	1954	0.996	(0.060)	2082	0.945	(0.228)
Employed spouse	1868	0.242	(0.428)	1965	0.862	(0.345)
Illiterate/never gone to school(spouse)*	1954	0.152	(0.358)	2082	0.044	(0.205)
Primary school (spouse)	1954	0.460	(0.498)	2082	0.367	(0.481)
Secondary school (spouse)	1954	0.110	(0.313)	2082	0.151	(0.358)
High school (spouse)	1954	0.170	(0.376)	2082	0.215	(0.410)
University/college or higher (spouse)	1954	0.059	(0.235)	2082	0.110	(0.313)
Healthy spouse	1868	0.789	(0.408)	2082	0.761	(0.426)

**Variables used as reference groups in the analysis.*

N: Number of observations

CHAPTER 4

RESULTS

4.1 Parents' time allocation decision to childcare

The result of the first stage of the double hurdle model, which is a probit model, is given in table 4.1.1. Table 4.1.2 shows marginal effects of each variable as a result of the probit model. The results are given for three estimations for each parent; one for weekday childcare time of each parent, one for weekends and last columns of each parent for average childcare time. The probability of spending time in childcare is on average predicted at 84% for mothers when all variables are kept at their mean. The corresponding figure for fathers is 43%. The observed probabilities are 76% and44%, respectively.

I firstly interpret the effect of educational level of parents on their childcare time since it is the primary interest of the study. The educational level of fathers has no significant effect on the probability of spending time with their children in all three estimations. The only exception is for those with university or higher degree: the probability of spending time with their children during the weekends is higher by 14 percentage points at 10% significance level for this group of fathers as compared to those without any schooling. In other words, being a university graduate positively affects their time allocation decision to their children but only on weekends. On the other hand, having higher levels of education are statistically significant for mothers' probability to spend time with their children on average. Their probability of spending time with their children increases with their educational level. For instance, if the mother is a university graduate, her likelihood of spending time with her children increases by8.8percentage points on average at 5% significance level as compared to those without any schooling.

When mothers' childcare time on weekdays and on the weekends is investigated separately some differences are observed. During the week days, being a university graduate is found to be significant correlates of time spent on child care: University graduated mothers' probability to spend time with their children is higher by 15 percentage points (sd= 0.043)as compared to mothers without any education. Mothers with university or higher degree are more likely devote time to their children although the highest employment rate is observed for mothers with university or higher degree. On the other hand, only having a secondary school education increases the probability of mothers' spending time with children at weekends compared to illiterate mothers. Secondary school graduates' probability to spend time with their children is higher by 7.7 percentage points (sd= 0.047) at weekends as compared to illiterate mothers. However, a monotone increase is not observed in the probability. The predicted probability of mothers' time in childcare by education level is shown in Figure4.1.1. Predicted probabilities are calculated for each educational level holding all other variables at means. It has an upward trend for both days as the educational level of mothers increases.

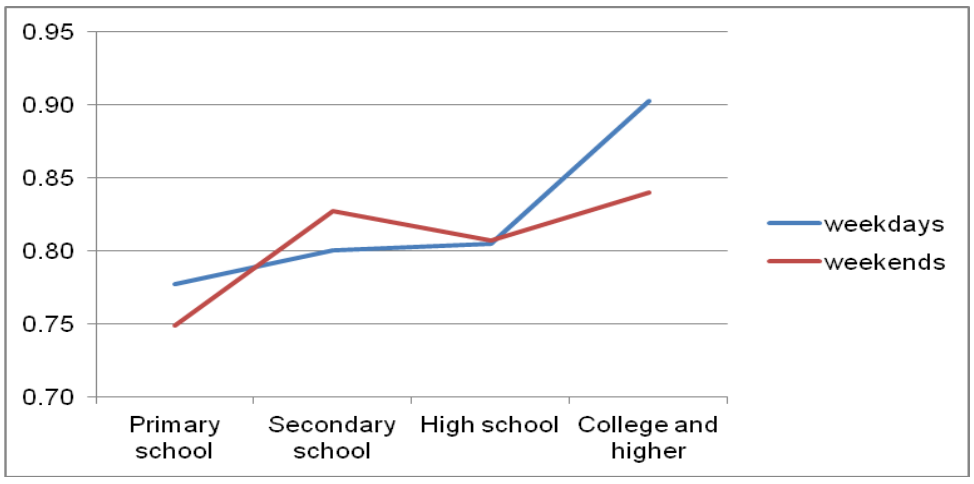

Figure 4.1.1. Predicted probability of mothers' childcare time by education level

Next, I turn to the association between childcare time and spouses' education level. Having a university graduate spouse is statistically significant in the parent's probability to spend time with their children. While it leads the probability of fathers' childcare time allocation to increase by 15.6 percentage points on average, the time allocation probability of mothers decreases 12.4 percentage points on weekends when their spouse is graduated from university. While fathers having spouse with university degree or higher tend to spend more time with their children, it is the reverse for mothers who have spouse with university degree or higher. These findings are consistent with the findings of the studies in the literature and also, it shows why some studies emphasize mothers' educational level (Hill and Stafford, 1980; Leibowitz, 1975; Gimenez-Nadal and Molina, 2013). Having a university graduate mother in the family has two effects; firstly on their childcare time allocation decision, secondly on their spouses' time allocation decision.

Now, the other characteristics of parents and the family will be discussed. While father's age is not positively associated with the time allocation decision to their children, mother's age is. Mothers' likelihood of spending time with their children decreases at an increasing rate with their age. On average, getting one year older decreases the probability of mothers' time with their children approximately by 2.1 percentage points. This might have to do with older mothers having older children. As noted earlier, younger children and especially babies are more time consuming. As the parents get older, the age of children increases.

While being employed increases the probability of spending time with children of mothers on weekdays, time at work has a negative effect on the time allocation decision of both parents. Employed mothers' probability is higher by 13 percentage points than their non-employed counterparts. On the other hand, as the time spent at work increases, working mothers are less likely allocate time to their children. However, there are two factors affecting time allocation decision of mothers in relation to work; being employed in the public sector and working on own account. If mothers are working in the public sector, their probability to

allocate time to childcare increases by 13.4 percentage points on weekends as compared to mothers working in the private sector. Mothers working in the private sector are more likely to work on weekends; therefore, their probability is less than mothers working in the public sector. Moreover, the probability of time allocation to childcare of the mother who is working on her own account is higher by 12.5 percentage points on weekends compared to the mother who is an unpaid family worker. It might be because the mother working on her own account has more flexible working hours on weekends compared to mothers who are unpaid family worker.

Being university graduates does not affect mothers' childcare time allocation decision on both days if they are wage earner at the public sector. However, university graduate mothers are more likely to spend time with their children compared to illiterate mothers when they are wage earning workers at the private sector. Moreover, working at the public or private sector does not make any impact on university graduate and wage earning mothers' decision to devote time to their children on weekdays. However, it affects their probability on weekdays. University graduate mothers are more likely to spend time with their children if they work at the public sector on weekends.

Having the spouse in the household and the employment status of the spouse are found to be significant in some specifications only. If their spouse is in the household, mothers' likelihood of spending time with their children decreases by 14 percentage points on weekdays and 11 percentage points on weekends. Additionally, if mothers have an employed spouse, their time allocation probability increases by 7.6 percentage points on weekdays and 13 percentage points on weekends. On the other hand, having a spouse in the household has no effect on fathers' time allocation decision. The difference in results between mothers with spouses and lone mothers reflect that childcare time of parents in two-parent households is substitutes (Kalenkoski, Ribar and Stratton, 2007).

In order to see the effect of the characteristics of the child on the childcare time allocation probability of parents, the association between their ages and sexes and time allocation probability of parents is investigated. The probit model results reveal that the age of the child is statistically significant in the childcare time allocation decision of both parents. Compared to girls between the ages of 15-17, the probability of mothers' and fathers' time allocation to their daughters aged 0-2 is 33 percentage points and 64 percentage points higher on average, respectively. As the child gets older, the probability drops monotonically as expected. The probability that fathers spend time on childcare for children between the ages 6-14 is approximately 35 percentage points more than that of fathers who have children between the ages of 15-17. On the other hand, this probability is lower for mothers. Mothers having children between the ages of 6- 14 have 21 percentage points higher probability of spending time with their children compared to mothers having children between the ages of 15-17. In earlier discussions, t-test results show that childcare time of parents does not associate with the sex of children. Probit results also come up with the same result. The difference between the time allocation probability of parents to their 15-17 years old boys and girls is statistically insignificant.

When I investigate the effect of household characteristics on time allocation probability of parents, only wealth has an effect on the probability but this the case only for mothers. If the family is among the second or third 20% group in wealth (becoming richer), mothers' time allocation probability to childcare decreases compared to the poorest families. The wealthier they become until a certain level, the lower the probability that they devote time to their children. As they become richer and among the richest group, the effect of wealth disappears. As Gratz (2006) concludes, families with lower income have to work longer hours. Therefore, their childcare time decreases. Compared to the poorest group, parents in second and third 20% in wealth are more likely to spend less time. They might be their relatives' support or they might buy it in the market.

Table 4.1.1. Probit Estimation (Childcare time of parents in each day)

	MEN			WOMEN		
Explanatory Variables	weekday	weekend	Average of two days	weekday	weekend	Average of two days
Educational level of parents						
Primary school	0.016	0.003	-0.003	0.152	0.052	0.230**
	(0.163)	(0.169)	(0.156)	(0.096)	(0.093)	(0.098)
Secondary school	0.221	0.158	0.210	0.146	0.251	0.209
	(0.182)	(0.187)	(0.174)	(0.162)	(0.166)	(0.176)
High school	0.238	0.259	0.216	0.167	0.169	0.234
	(0.179)	(0.185)	(0.172)	(0.147)	(0.148)	(0.156)
University/college or higher	0.187	0.381*	0.302	0.607***	0.264	0.455*
	(0.205)	(0.211)	(0.198)	(0.230)	(0.228)	(0.235)
Primary school (spouse)	0.097	0.132	0.165	0.169	0.055	-0.064
	(0.108)	(0.108)	(0.104)	(0.167)	(0.155)	(0.165)
Secondary school (spouse)	0.176	0.145	0.261*	-0.007	-0.185	-0.296
	(0.141)	(0.143)	(0.138)	(0.182)	(0.170)	(0.182)
High school (spouse)	0.110	0.054	0.091	0.047	-0.137	-0.180
	(0.136)	(0.137)	(0.132)	(0.180)	(0.170)	(0.179)
University and higher(spouse)	0.327*	0.367*	0.393**	-0.057	-0.348*	-0.372*
	(0.191)	(0.190)	(0.186)	(0.203)	(0.197)	(0.205)

Table 4.1.1. Probit Estimation (Childcare time of parents in each day) (Continued)

Characteristics of parents						
Age	-0.034	0.003	-0.038	-0.067***	-0.079***	-0.086***
	(0.023)	(0.027)	(0.023)	(0.022)	(0.021)	(0.022)
Agesquared/100	0.017	-0.022	0.017	0.033	0.046**	0.052**
	(0.025)	(0.030)	(0.025)	(0.024)	(0.022)	(0.022)
Being healthy	-0.157*	0.051	-0.046	0.009	-0.006	-0.039
	(0.086)	(0.087)	(0.083)	(0.079)	(0.079)	(0.083)
Employed	-0.114	-0.188	-0.528	0.470**	-0.156	0.312
	(0.642)	(0.564)	(0.578)	(0.200)	(0.187)	(0.206)
Work time (average hrs per week)	-0.003*	-0.004*	-0.005**	-0.016***	-0.008**	-0.015***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Public sector	-0.019	-0.088	-0.123	-0.024	0.474*	0.191
	(0.107)	(0.110)	(0.106)	(0.247)	(0.242)	(0.246)
Wage earner	0.216	0.348	0.745	-0.097	0.074	-0.033
	(0.634)	(0.554)	(0.569)	(0.173)	(0.172)	(0.178)
Own account work	0.192	0.200	0.708	-0.074	0.434**	0.230
	(0.634)	(0.554)	(0.569)	(0.188)	(0.200)	(0.207)
Having spouse in the household	-0.344	0.580	0.100	-0.528**	-0.378*	-0.291
	(0.490)	(0.671)	(0.524)	(0.222)	(0.215)	(0.227)
Employed spouse	-0.044	0.031	0.012	0.231*	0.381***	0.314**
	(0.084)	(0.084)	(0.082)	(0.124)	(0.119)	(0.126)
Healthy spouse	0.005	-0.093	-0.095	-0.108	0.058	-0.055
	(0.086)	(0.087)	(0.084)	(0.091)	(0.090)	(0.094)

Table 4.1.1. Probit Estimation (Childcare time of parents in each day) (Continued)

Characteristic of children						
Ratio of 0-2 yrs old girls	1.272***	1.649***	1.634***	1.763***	1.595***	1.384***
	(0.254)	(0.255)	(0.243)	(0.282)	(0.277)	(0.287)
Ratio of 3-5 yrs old girls	0.991***	1.516***	1.334***	1.438***	1.700***	1.468***
	(0.243)	(0.243)	(0.225)	(0.235)	(0.262)	(0.274)
Ratio of 6-14 yrs old girls	0.836***	0.811***	0.892***	0.871***	0.830***	0.858***
	(0.216)	(0.214)	(0.192)	(0.159)	(0.160)	(0.160)
Ratio of 0-2 yrs old boys	1.386***	1.721***	1.614***	2.392***	2.456***	2.498***
	(0.253)	(0.257)	(0.245)	(0.349)	(0.435)	(0.421)
Ratio of 3-5 yrs old boys	1.229***	1.319***	1.421***	1.308***	1.417***	1.336***
	(0.236)	(0.238)	(0.220)	(0.227)	(0.231)	(0.260)
Ratio of 6-14 yrs old boys	0.761***	0.867***	0.820***	0.783***	0.689***	0.730***
	(0.212)	(0.210)	(0.187)	(0.155)	(0.156)	(0.155)
Ratio of 15-17 yrs old boys	-0.364	-0.019	-0.200	-0.056	-0.044	-0.097
	(0.262)	(0.250)	(0.222)	(0.175)	(0.175)	(0.169)
Household Characteristics						
2nd 20% in Wealth	-0.032	-0.134	-0.194*	-0.027	-0.273**	-0.120
	(0.114)	(0.116)	(0.114)	(0.116)	(0.115)	(0.122)
3rd 20% in Wealth (moderate)	-0.038	-0.029	-0.139	-0.009	-0.306***	-0.124
	(0.115)	(0.116)	(0.114)	(0.117)	(0.116)	(0.124)
4th 20% in Wealth	0.068	0.086	0.050	0.028	-0.103	-0.014
	(0.119)	(0.120)	(0.117)	(0.120)	(0.124)	(0.131)

Table 4.1.1. Probit Estimation (Childcare time of parents in each day) (Continued)

Top 20% in Wealth (the richest)	-0.040	-0.028	-0.048	0.044	-0.124	0.012
	(0.127)	(0.128)	(0.125)	(0.125)	(0.128)	(0.136)
Rural	-0.006	0.020	-0.063	0.022	0.098	0.105
	(0.077)	(0.078)	(0.076)	(0.082)	(0.082)	(0.087)
Constant	0.110	-1.836*	0.110	1.934***	2.130***	2.614***
	(0.796)	(0.937)	(0.813)	(0.570)	(0.555)	(0.610)
Observations	1,779	1,775	1,787	1,917	1,914	1,921

Notes: Absolute value of t statistics in parenthesis

** significant at 10%; ** significant at 5%; *** significant at 1%*

Reference groups are: illiterate parents, illiterate spouses, unpaid family worker, and ratio of 15-17 years old girls to all children, the poorest in wealth.

Table 4.1.2. Marginal Effect Estimation after Probit

	MEN			WOMEN		
Explanatory Variables	weekday	weekend	Average of two days	weekday	weekend	Average of two days
Educational level of parents						
Primary school	0.005	0.001	-0.001	0.048	0.017	0.056**
	(0.054)	(0.058)	(0.061)	(0.030)	(0.031)	(0.024)
Secondary school	0.077	0.056	0.083	0.044	0.077*	0.046
	(0.066)	(0.068)	(0.069)	(0.047)	(0.047)	(0.035)
High school	0.083	0.093	0.085	0.050	0.053	0.052*
	(0.064)	(0.068)	(0.068)	(0.042)	(0.045)	(0.031)
University/college or higher	0.065	0.141*	0.120	0.154***	0.081	0.088**
	(0.074)	(0.081)	(0.078)	(0.043)	(0.063)	(0.035)
Primary school (spouse)	0.033	0.046	0.065	0.052	0.018	-0.015
	(0.036)	(0.037)	(0.041)	(0.051)	(0.051)	(0.040)
Secondary school (spouse)	0.061	0.051	0.104*	-0.002	-0.063	-0.079
	(0.051)	(0.052)	(0.055)	(0.057)	(0.060)	(0.053)
High school (spouse)	0.038	0.019	0.035	0.015	-0.046	-0.046
	(0.047)	(0.048)	(0.052)	(0.055)	(0.058)	(0.047)
University or higher (spouse)	0.118*	0.136*	0.156**	-0.018	-0.124*	-0.103
	(0.073)	(0.074)	(0.072)	(0.066)	(0.073)	(0.063)

Table 4.1.2. Marginal Effect Estimation after Probit (Continued)

Characteristics of parents						
Age	-0.011	0.001	-0.015	-0.021***	-0.026***	-0.021***
	(0.008)	(0.009)	(0.009)	(0.006)	(0.006)	(0.005)
Agesquared/100	0.006	-0.007	0.006	0.010	0.015**	0.012**
	(0.008)	(0.010)	(0.009)	(0.007)	(0.007)	(0.005)
Being healthy	-0.054*	0.017	-0.018	0.002	-0.002	-0.009
	(0.030)	(0.029)	(0.032)	(0.025)	(0.026)	(0.019)
Employed	-0.039	-0.067	-0.208	0.135***	-0.052	0.069
	(0.226)	(0.209)	(0.221)	(0.052)	(0.064)	(0.042)
Work time (average hrs per week)	-0.001*	-0.001*	-0.001**	-0.005***	-0.002**	-0.003***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Public sector	-0.006	-0.030	-0.048	-0.007	0.134**	0.042
	(0.035)	(0.036)	(0.041)	(0.079)	(0.056)	(0.049)
Wage earner	0.072	0.118	0.282	-0.031	0.024	-0.008
	(0.207)	(0.184)	(0.203)	(0.057)	(0.055)	(0.044)
Own account work	0.066	0.070	0.276	-0.024	0.125***	0.050
	(0.222)	(0.200)	(0.214)	(0.062)	(0.048)	(0.039)
Having spouse in the household	-0.125	0.165	0.039	-0.139***	-0.112**	-0.061
	(0.190)	(0.146)	(0.201)	(0.046)	(0.055)	(0.041)
Employed spouse	-0.014	0.011	0.004	0.076*	0.135***	0.084**
	(0.028)	(0.029)	(0.032)	(0.043)	(0.044)	(0.037)
Healthy spouse	0.001	-0.032	-0.037	-0.034	0.019	-0.013
	(0.029)	(0.031)	(0.033)	(0.026)	(0.030)	(0.022)

Table 4.1.2. Marginal Effect Estimation after Probit (Continued)

Characteristic of children						
Ratio of 0-2 yrs old girls	0.428***	0.572***	0.642***	0.557***	0.529***	0.336***
	(0.085)	(0.087)	(0.095)	(0.088)	(0.091)	(0.069)
Ratio of 3-5 yrs old girls	0.334***	0.526***	0.524***	0.455***	0.564***	0.356***
	(0.081)	(0.083)	(0.088)	(0.075)	(0.087)	(0.066)
Ratio of 6-14 yrs old girls	0.281***	0.282***	0.350***	0.275***	0.275***	0.208***
	(0.072)	(0.073)	(0.075)	(0.051)	(0.054)	(0.040)
Ratio of 0-2 yrs old boys	0.466***	0.597***	0.634***	0.756***	0.814***	0.606***
	(0.0845	(0.088)	(0.096)	(0.106)	(0.136)	(0.095)
Ratio of 3-5 yrs old boys	0.414***	0.458***	0.558***	0.413***	0.470***	0.324***
	(0.078)	(0.081)	(0.086)	(0.072)	(0.077)	(0.063)
Ratio of 6-14 yrs old boys	0.256***	0.301***	0.322***	0.247***	0.228***	0.177***
	(0.070)	(0.072)	(0.073)	(0.049)	(0.052)	(0.038)
Ratio of 15-17 yrs old boys	-0.123	-0.006	-0.078	-0.017	-0.014	-0.023
	(0.088)	(0.086)	(0.087)	(0.055)	(0.057)	(0.041)
Household Characteristics						
2nd 20% in Wealth	-0.011	-0.045	-0.075*	-0.008	-0.094**	-0.030
	(0.038)	(0.038)	(0.043)	(0.037)	(0.041)	(0.032)
3rd 20% in Wealth (moderate)	-0.012	-0.010	-0.054	-0.002	-0.107**	-0.031
	(0.038)	(0.040)	(0.044)	(0.037)	(0.042)	(0.032)
4th 20% in Wealth	0.023	0.030	0.019	0.009	-0.034	-0.003
	(0.041)	(0.042)	(0.046)	(0.037)	(0.042)	(0.032)

Table 4.1.2. Marginal Effect Estimation after Probit (Continued)

Top 20% in wealth (the richest)	-0.013	-0.009	-0.019	0.013	-0.041	0.003
	(0.042)	(0.044)	(0.049)	(0.039)	(0.044)	(0.032)
Rural	-0.002	0.007	-0.025	0.007	0.032	0.025
	(0.026)	(0.027)	(0.029)	(0.025)	(0.026)	(0.020)
Observations	1,779	1,775	1,787	1,917	1,914	1,921
Observed Prob.	0.309	0.329	0.445	0.691	0.662	0.765
Predicted Prob.	0.279	0.298	0.430	0.752	0.728	0.840
Wald Chi-square(31)	221.61	277.15	346.69	400.17	413.56	368.04
Pseudo R-square	0.117	0.144	0.162	0.237	0.260	0.246

Notes: Absolute value of t statistics in parenthesis

** significant at 10%; ** significant at 5%; *** significant at 1%*

Reference groups are: illiterate parents, illiterate spouses, unpaid family worker, and ratio of 15-17 years old girls to all children, the poorest in wealth.

4.2 Childcare time of Parents

The result of the second stage of the double hurdle model is given in table 4.2.1. It is a truncated regression on non-zero observations of time. Therefore, observation numbers are lower compared to the probit model. Coefficients of truncated regressions are interpreted in the same way as OLS coefficients. However, they are conditional on spending time with the child.

Unlike the probit estimation results, all educational levels are found to be statistically significant for childcare time of both parents. It should be noted that the results are conditional on spending time with children. Compared to illiterate parents, parents with any educational level spend more direct time with their children. Childcare time of fathers and mothers who completed primary school increase by 54% and 19% compared to illiterate counterparts at 1% significance level. Moreover, high school graduate and university graduate fathers spend, respectively, 64% and 81% more time with their children on average (significant at 1% level). It is higher by 32% for high school graduate mothers and 30% for university graduate mothers. It seems that education substantially raises awareness of parents about their child-rearing behaviors. Nevertheless, childcare time of parents does not increase monotonically with increasing years of schooling. The only exception of it is childcare time of fathers on weekends. There is a monotone increase in their childcare time with their increasing years of schooling. The effect becomes stronger as the fathers' schooling level increases. Moreover, mothers' educational level is statistically significant on childcare time of fathers during weekdays. There is a monotone increase in fathers' childcare time when their spouses have higher level of education. For Spain and U.K., Gimenez-Nadal and Molina (2013) find that what really matters for the time devoted to childcare by parents is mothers' educational level. It increases the childcare time of both mothers and fathers. This is also valid for Turkey.

After parental educational level, I investigate the effects of parental characteristics on their childcare time. Conditional on spending time with their children, age is found to have negative effect on childcare time of fathers on weekdays and mothers on weekends. As they get older, their childcare time decreases at an increasing rate. As fathers' age increases by a year, their childcare time on weekdays decreases by 9% at 1% significance level. On the other hand, childcare time of mothers decreases by 4% on weekends as their age increases by a year. Being employed is statistically significant on both parents' childcare time. Conditional on spending time with children, childcare time of fathers increases by 51% on weekdays compared to non-employed fathers. If fathers are working, they devote more time to their children, which contradicts the literature. A plausible explanation is that non-employed fathers might have health problems or some other problems. However, as work time increases, childcare time of working fathers decreases by 0.5% for each hour worked. Childcare time of employed mothers, on the other hand, decreases by 64% on weekdays compared to their non-employed counterparts. If they are working, it means that they devote more time to work and less time to childcare. Employed mothers' probability to devote time to their children is higher, but if they devote time, they will tend to devote less time than non-employed mothers. This corroborates with the human capital theory of Becker (1965). Compared to mothers working in the private sector, mothers working in the public sector devote more time to their children on average. It increases their time by 33%. Private sector is more time-intensive; therefore, individuals working in the private sector spend more time at work. Working overtime is more common in the private sector. Although any effect of being a wage worker or working on own account could not be found at the first stage, they are statistically significant at 1% significance level at the second stage.

In order to see the effect of the characteristics of the child on childcare time of parents, the association between their ages and sexes and childcare time of parents is investigated. The second stage results reveal that the age of the child is statistically

significant in the childcare time of mothers. As the child gets older, time devoted monotonically decreases. Compared to girls between the ages of 15-17, mothers' childcare time devoted to daughters between the ages of 0-2 increases by 263% on average. Mothers devote 182% more time to girls between the ages of 3-5 and 95% more time to girls between the ages of 6-14 on average compared to the mothers having daughters between the ages of 15-17. The results are almost the same for boys. Mothers' childcare time devoted to boys between the ages of 0-2 increases by 272% on average compared to girls aged 15-17. Mothers devote 186% more time to boys between the ages of 3-5 and % more time to boys between the ages of 6-14 on average compared to the mothers having boys between the ages of 15-17. On the other hand, when I look at the effect of sex and ages of children on fathers' childcare time, I cannot find any significant difference between time devoted to children between the ages of 6-14 and children between the ages of 15-17. However, they devote more time to children between the ages 0-5 on average. Additionally, test results reveals that gender of children is not effective on childcare time of parents. There is no statistically significant difference between the time devoted to girls and boys at the same age group. Then, I move to investigating how household characteristics affect childcare time of parents. Living in rural areas is found to have significantly negative effect on childcare time of mothers. Compared to mothers living in urban areas, childcare time of mothers living in rural areas decreases by 17% on average. This corroborates with Becker (1993), which is about the quantity and quality of children. Families living in rural areas care more about the quantity of children and less about the quality of them. Therefore, childcare time is lower for mothers living in rural areas. Moreover, the positive effect of wealth on childcare time of mothers is found. Compared to the poorest group, mothers with higher wealth spend more time with their children although the increase is not monotone with wealth. As Gratz (2006) concludes, families with lower income have to work longer hours. Therefore, their childcare time decreases.

Table 4.2.1. Second stage of double hurdle model (Truncated regression) (Childcare time of parents in each day)

	MEN			WOMEN		
Explanatory Variables	weekday	weekend	Average of two days	weekday	weekend	Average of two days
Educational level of parents						
Primary school	0.579**	0.529**	0.537***	0.280***	0.240***	0.188**
	(0.233)	(0.232)	(0.202)	(0.083)	(0.083)	(0.076)
Secondary school	0.439*	0.590**	0.521**	0.500***	0.409***	0.441***
	(0.245)	(0.243)	(0.216)	(0.100)	(0.107)	(0.097)
High school	0.451*	0.734***	0.640***	0.398***	0.326***	0.325***
	(0.235)	(0.240)	(0.209)	(0.108)	(0.112)	(0.103)
University/college or higher	0.633**	0.840***	0.811***	0.417***	0.257*	0.304*
	(0.263)	(0.257)	(0.228)	(0.156)	(0.163)	(0.156)
Primary school (spouse)	0.272*	0.149	0.225	-0.209	-0.162	-0.117
	(0.164)	(0.144)	(0.141)	(0.150)	(0.152)	(0.149)
Secondary school (spouse)	0.348*	0.107	0.194	-0.202	-0.052	-0.067
	(0.190)	(0.161)	(0.158)	(0.161)	(0.161)	(0.160)
High school (spouse)	0.459***	0.0695	0.272*	-0.156	-0.086	-0.073
	(0.178)	(0.168)	(0.158)	(0.159)	(0.160)	(0.158)
University and higher(spouse)	0.558**	0.272	0.471**	-0.198	-0.134	-0.076
	(0.229)	(0.203)	(0.204)	(0.174)	(0.183)	(0.173)

Table 4.2.1. Second stage of double hurdle model (Truncated regression) (Childcare time of parents in each day) (Continued)

Characteristics of parents						
Age	-0.094***	-0.070	-0.082***	-0.037	-0.043**	-0.031
	(0.031)	(0.052)	(0.030)	(0.032)	(0.018)	(0.021)
Agesquared/100	0.115***	0.088	0.101***	0.031	0.046**	0.017
	(0.036)	(0.064)	(0.036)	(0.043)	(0.023)	(0.026)
Being healthy	0.014	0.165	0.149	0.028	0.034	0.018
	(0.099)	(0.101)	(0.098)	(0.064)	(0.068)	(0.063)
Employed	0.507**	0.331	0.746***	-0.640***	-0.385**	-0.491***
	(0.244)	(0.240)	(0.225)	(0.153)	(0.160)	(0.155)
Work time (average hrs per week)	-0.033	-0.003	-0.004**	0.005*	-0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Public sector	-0.039	0.041	-0.021	0.283*	0.193	0.327*
	(0.103)	(0.112)	(0.104)	(0.171)	(0.180)	(0.172)
Wage earner	-0.491***	-0.086	-0.594***	0.076	0.279*	0.161
	(0.140)	(0.163)	(0.147)	(0.141)	(0.166)	(0.151)
Own account work	-0.758***	-0.203	-0.807***	0.158	0.085	0.135
	(0.148)	(0.172)	(0.153)	(0.164)	(0.156)	(0.153)
Having spouse in the household	-1.075***	1.805***	-0.720**	0.456**	-0.083	0.045
	(0.371)	(0.263)	(0.357)	(0.210)	(0.212)	(0.208)
Employed spouse	0.052	0.114	0.008	-0.037	0.277**	0.132
	(0.102)	(0.096)	(0.092)	(0.107)	(0.118)	(0.106)
Healthy spouse	0.057	-0.021	0.011	-0.027	-0.032	-0.006
	(0.106)	(0.109)	(0.097)	(0.069)	(0.077)	(0.070)

Table 4.2.1. Second stage of double hurdle model (Truncated regression) (Childcare time of parents in each day) (Continued)

Characteristic of children						
Ratio of 0-2 yrs old girls	0.378	0.450	0.632*	2.296***	2.247***	2.636***
	(0.349)	(0.372)	(0.327)	(0.219)	(0.251)	(0.223)
Ratio of 3-5 yrs old girls	0.204	0.327	0.528	1.323***	1.528***	1.820***
	(0.355)	(0.363)	(0.325)	(0.223)	(0.246)	(0.222)
Ratio of 6-14 yrs old girls	0.121	-0.131	0.115	0.746***	0.573**	0.949***
	(0.342)	(0.364)	(0.316)	(0.213)	(0.238)	(0.212)
Ratio of 0-2 yrs old boys	0.553	0.567	0.952***	2.308***	2.312***	2.720***
	(0.345)	(0.364)	(0.321)	(0.222)	(0.256)	(0.226)
Ratio of 3-5 yrs old boys	0.380	0.285	0.582*	1.528***	1.505***	1.866***
	(0.346)	(0.356)	(0.316)	(0.220)	(0.247)	(0.222)
Ratio of 6-14 yrs old boys	-0.105	-0.268	0.019	0.771***	0.727***	1.008***
	(0.340)	(0.362)	(0.313)	(0.210)	(0.237)	(0.211)
Ratio of 15-17 yrs old boys	-0.388	0.382	0.088	0.267	0.106	0.244
	(0.537)	(0.483)	(0.460)	(0.263)	(0.261)	(0.249)
Household Characteristics						
2nd 20% in Wealth	0.217*	0.257**	0.294**	0.305***	0.302***	0.251***
	(0.129)	(0.124)	(0.116)	(0.085)	(0.086)	(0.081)
3rd 20% in Wealth (moderate)	0.109	0.107	0.158	0.194**	0.195**	0.127
	(0.124)	(0.126)	(0.117)	(0.087)	(0.091)	(0.083)
4th 20% in Wealth	0.0803	0.161	0.184*	0.240***	0.218**	0.179**
	(0.128)	(0.133)	(0.111)	(0.087)	(0.092)	(0.084)

Table 4.2.1. Second stage of double hurdle model (Truncated regression) (Childcare time of parents in each day) (Continued)

Top 20% in Wealth (the richest)	0.0843	0.076	0.097	0.291***	0.261***	0.231***
	(0.138)	(0.135)	(0.118)	(0.093)	(0.096)	(0.088)
Rural	-0.113	-0.042	-0.016	-0.091	-0.159**	-0.170***
	(0.0903)	(0.091)	(0.082)	(0.061)	(0.064)	(0.060)
Constant	5.124***	1.713	3.874***	2.829***	3.009***	2.645***
	(0.802)	(1.199)	(0.802)	(0.623)	(0.488)	(0.492)
Number of Observations	551	584	796	1,325	1,268	1,470

Notes: Absolute value of t statistics in parenthesis

** significant at 10%; ** significant at 5%; *** significant at 1%*

Reference groups are: illiterate parents, illiterate spouses, unpaid family worker, and ratio of 15-17 years old girls to all children, the poorest in wealth.

CHAPTER 5

CONCLUSION

Although various studies conducted for childcare time of parents in many countries, it had not been studied in Turkey yet. This paper is an initial attempt to analyse the effects of parental education and other variables on childcare activities of parents in Turkey. To that end, 2006 Time Use Survey of TurkStat is used. The time that each parent with at least one child under 18 devotes to childcare is analyzed.

As most studies conclude, the amount of childcare of parents is undoubtedly related to education. The results of the study collaborate with the findings of these studies in the literature. To summarize according to the estimation results, educational level is found to have a positive impact on time amount of both parents. Moreover, it is found that university graduate parents are more likely to devote time to their children. Although educational level is found to be statistically insignificant on time allocation decision of parents for childcare, educational level is statistically significant for how much time to devote to children. Whether it is because parents with higher levels of education care more about their children, or because they enjoy more while spending time with their children, many empirical studies show its important positive effects on the development of children.

While educational level of spouse has no impact on the direct time allocation decision of parents to childcare except university graduates, having educated spouse increases fathers' childcare time on weekdays. Therefore, the study reveals the importance of education of women in Turkey once more. It has two effects in terms of childcare: firstly educated mothers spend more time with their children, and secondly, fathers who have educated spouses spend more time with their children.

The results prove the prevailing view that it is primarily mothers' education that matters.

When I control for the effect of parents' characteristics on their childcare time, age of mothers decreases their likelihood to devote time their children. As they get older, their childcare time decreases on weekends; additionally, their likelihood to devote time decreases. Age of fathers, on the other hand, decreases their direct childcare time at an increasing rate on weekdays.

Employment status and flexibility of work generally affects either mothers' direct childcare time or fathers'. Employing mothers are more likely to devote direct time to their children on weekdays compared to non-employed counterparts; however, being employed decreases the amount of time mothers spend with their children. Employing at public sector, being wage earner or working his/her own account have different flexibilities on time at work. Employing at public sector provide more free time to individuals because working hours at public sector is more determined and overtime is less. Therefore, I control their effects on childcare time. Employing at the public sector is found to be statistically significant on both time allocation decision and the amount of time of mothers. If they are working at the public sector, they are more likely to devote time to their children on weekends and they can devote more time to their children on weekdays. On the other hand, being a wage earner or employing his own account is statistically significant on childcare time amount of fathers. If they are wage owner or employing own account, their direct childcare time decreases compared to unpaid family workers.

Having spouse in the household may affect time allocation of the family and employment status and health status of spouse may affect childcare time of parents. When they are controlled, it is found that having spouse increases fathers' time on weekends and decreases it on weekdays. However, it decreases mothers' probability to devote time to their children on both days. If both parents are in the household, childcare responsibility is shared by parents. Fathers take more responsibility about their children. Additionally, having employing spouse increases mothers' probability

of spending time with children on both days and increases the amount of time on weekends. If men are working, women take care of children more.

As discussed earlier, sexes of children are not found statistically significant on childcare time of parents. However, their age groups are unsurprisingly found statistically significant for both parents on probit model. As they have younger children, their probability of devoting time to their children increases. For the second stage of double hurdle model, which is the amount decision of individuals, the age group of children is only statistically significant for mothers. At early ages, children are more time consuming and more needs mothers' time. Therefore, time amount of mothers is decreasing as children gets older.

Family is the smallest unit in the society and human capital formation starts at home. The main environment for children, especially for preschoolers, is the family and parents are the first and permanent teachers and also role models of children. Families are as important as schools in shaping youths' skills and developing their knowledge (Israel et al., 2001). The preparation of children by families affects children's schooling, labor market performance and social life. In other words, the care and well-being of children represent the future well-being of the society.

Learning is a dynamic process and is most effective when it begins at a young age and continues through adulthood. The role of the family is crucial to the formation of human capital of children (Heckman, 2000). Failed families produce low-ability, poorly motivated students who do not succeed in school. Policies designed to promote educational achievement must seek to strengthen social capital in the family (Israel et al, 2001). Enhancing families' capacity is essential for promoting students' educational achievement. The goal is to create home environment where parent-child relationships are strong, and where parents place a high value on education (Israel et al, 2001).

Time Use Survey was firstly conducted in 2006 and the study is among the first studies dealing with it. The survey is detailed and informative; therefore,

researchers can deal with time use behaviors of individuals in Turkey with different research questions.

In the future, the effect of childcare time on children's development can also be studied in order to develop this study. Although various studies show positive effect of it on children' development, it has not been conducted in Turkey yet. Moreover, changing behaviors of individuals can be studied when TurkStat collects new data of time use in the future. Since women's labor force participation increases incrementally, their time allocation behaviors, and time allocation of parents are expected to change. Which factors affect their time allocation and how their time to various activities has changed can be studied.

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APPENDIX A

TURKISH SUMMARY

Beşeri sermaye terimi 19. yüzyıldan beri bilinse de, iktisat literatürüne girişi 1950-1960'larda Schultz ve Becker'in çalışmalarıyla gerçekleşmiştir. 1960'larda yaşanan ekonomik büyümeyi sadece üretim faktörlerinin artışıyla açıklamak yetersiz kalmıştır. Azalan verimler yasasına göre, uzun dönem ekonomik büyümenin temellerinden biri de beşeri sermayeyi güçlendirmektir. Böylelikle, beşeri sermaye literatürdeki yerini almış ve beşeri sermayenin arttırılması üzerine çalışılmaya başlanmıştır. Eğitim, işbaşı eğitimi, sağlık gibi alanlar beşeri sermayeye yapılan en önemli yatırımlardandır. Pek çok çalışma, eğitim düzeyine ilişkin verinin kolay erişilebilir olması sebebiyle, eğitimin ekonomik büyümeye etkileri üzerinde durmuştur. Okullar bireylerin yetenek ve bilgi birikimini arttırmada önemli olsa da, çocuğun okul dışı gelişimi de oldukça önemlidir. Bir çocuğun beşeri sermayesi küçük yaşlardan itibaren oluşmaya başlar ve okulun yanısıra ev ortamı, aile, çevre gibi faktörler de çocuğun gelişimi için önemlidir. Halbuki 1965'te Gary Becker'ın "*A Theory of the Allocation of Time"* isimli çalışmasına kadar aile de iktisat teorilerinde yer bulamamıştır. Bu çalışma ile birlikte aile, piyasa dışı hane üretimi, zaman kullanımı, evlilik, çocuk yetiştirme vb. konular da literatüre girmeye başlamıştır. Becker'ın teorisine göre aile sadece tüketen değil aynı zamanda da üreten bir varlıktır. Bu noktada Becker'ın bir diğer önemli katkısı da hane içi üretim fonksiyonuna mal ve hizmetlerin yanısıra zamanı da eklemiş olmasıdır (Gronau ve Hamermesh, 2006; Chiappori ve Lewbel, 2015). Aile bu üretimi yaparken girdi olarak sadece piyasadan aldığı mal ve hizmetleri değil, zamanı da kullanır. Bu yüzdendir ki son dönemlerde iktisat teorisi aile ve piyasa dışı hane üretimi konularına yönelmiştir. Bu konuları ele alan bir diğer önemli iktisatçı Jacob Mincer

ise, bireylerin işe ayrılan zaman ve boş zaman tercihine bir de evişlerine ayrılan zamanı eklemiştir.

Aile ekonomisi teorilerine göre, hane tek bir fayda fonksiyonuna sahiptir. Bireyler hanede üretilen ve tüketilen mal ve hizmetlerden fayda sağlamaktadırlar. Evde üretilen bu mal ve hizmetlerin girdileri ise zaman ve diğer mal ve hizmetlerdir. Bireyler maksimum faydayı sağlayacak şekilde zamanlarını işe, boş zaman aktivitelerine ve ev işlerine ayırırlar. Bu teoriye göre çocuk da ailenin ürettiği ve ondan fayda sağladığı şeylerden birisidir. Bu nedenle çocuğun beşeri sermayesinin oluşumunda önemli şeylerden biri de ailenin çocuğa ayırdığı zamandır.

Kişinin zekâ gelişimi ve kişilik oluşumu için en önemli dönem erken çocukluk dönemidir. Temel yetenekler, bilgi ve beceriler okul öncesi dönemde edinilmektedir (Young ve Mundial, 1996; Saraçoğlu ve Karaoğlan, 2016). Çocuklarda rasyonel düşünce, problem çözme ve muhakeme yeteneğinin erken yaşlarda oluştuğu bilinmektedir (Blakeslee, 1997; Santrock, 1998; Saraçoğlu ve Karaoğlan, 2016). Erken çocukluk gelişiminin de beşeri sermayeyi arttırdığını gösteren çalışmalar yer almaktadır. Erken çocukluk döneminde bu gibi yetenekleri kazanan çocuklar okul döneminde ve okul sonrası dönemde de başarılı olmaktadır (Heckman, 2000). Bu dönemdeki çocuklar için ise en önemli çevre ailedir. Ebeveynler çocukların ilk öğretmenleri ve rol modelleridir. Bu nedenle, aile çocuğun erken yaştaki fiziksel, psikolojik ve zekâ gelişiminde önemli bir rol oynamaktadır ve çocukların bilgi, beceri ve alışkanlıkları üzerinde ailenin etkisi görmezden gelinmemelidir (Becker, 1993). Anne-babanın çocuğuyla geçirdiği zaman ise bilgi, beceri ve yeteneklerin çocuğa geçmesinde en önemli yollardan biridir. Diğer yandan, aktif ebeveyn-çocuk ilişkisi sadece küçük yaştaki çocuklar için değil, okul dönemi çocukları için de yararlı ve önemlidir. Aileler, çocukların bilgi ve becerilerinin gelişmesinde en az okullar kadar önemli bir rol oynamaktadır (Israel ve diğerleri, 2001).PISA sonuçlarına göre; politik ve sosyal konuları, kitapları, olayları ebeveynleriyle tartışan çocuklar okuma becerilerinde daha

başarılıdır (OECD, 2012). Okul dönemindeki çocuklarla bu yollarla iletişim kurmak onların eleştirel düşünmelerine, daha meraklı, araştıran birer birey olarak yetişmelerine yardımcı olmaktadır.

Literatüre baktığımızda, pek çok çalışmanın anne-babanın eğitim seviyesi ile çocukların okul başarıları arasındaki pozitif ilişkiyi ortaya çıkardığını görmekteyiz (Chevalier, 2004; Dubow ve diğerleri, 2009). Bazı çalışmalar ise çocuğa yapılan yatırımlarda ebeveynlerin aktif rol oynamasını sağlayan etkenlerden birinin de onların eğitim düzeyi olduğunu göstermiştir. Yüksek eğitim düzeyine sahip ebeveynler çocukların gelişimine ve onların okul ve okul sonrası başarılarına daha çok önem vermekte, bu yüzden çocuklarıyla daha çok zaman geçirerek daha eğitici öğretici aktiviteler gerçekleştirmektedir (Davis-Kean, 2005).

Beşeri sermayenin üretim fonksiyonu tam olarak bilinmese de, literatürde ebeveynlerin çocuklarıyla geçirdiği zamanın önemini ortaya koyan pek çok çalışma yer almaktadır (Leibowitz, 1974; Datcher-Loury, 1988; Davis-Kean, 2005; Rasmussen, 2009; Hsin, 2008; Gayle, Golan ve Soytaş, 2011). Bu çalışmalar, ebeveynleriyle daha çok zaman geçiren çocukların IQ seviyelerinin yükseldiğini, okuldaki başarılarının arttığını ve eğitim düzeyinin yükseldiğini, buna bağlı olarak sonraki dönemde gelir seviyesinin arttığını göstermiştir. Ebeveynlerin fiziksel varlığı, duygusal ve ahlaki olarak çocukları desteklemeleri beşeri sermayenin aile içinde bir nesilden diğerine geçmesi için önemlidir. Ebeveynlerin çocuklarını yetiştirme tarzı ile çocuklarına karşı tutum ve davranışlarını ise onların eğitim düzeyleriyle ilişkilendirmek mümkündür. Davis-Kean ve Davis-Kean, Sexton ve Magnuson'ın 2005 yılında yaptıkları çalışmalar ailelerin eğitim düzeylerinin çocuk yetiştirmedeki inanç, beklenti, davranış ve tutumlar yoluyla çocuğa geçtiğini, bu şekilde çocuğun eğitim düzeyini arttırdığını göstermiştir. Eğitim düzeyi yüksek ailelerin çocuklarından başarı beklentisi yüksektir, bu nedenle bu aileler çocukların eğitimiyle daha ilgilidirler ve onların eğitimine ve gelişimine daha çok zaman ayırırlar. Ayrıca, eğitim düzeyi yüksek ebeveynlerin çocuklarıyla geçirdiği zamanı

daha çok eğitsel ve öğretici aktivitelere ayırması onlarla geçirdiği zamanın kalitesinin artmasını sağlamaktadır (Hsin, 2008).

Çocuk bakımı ve ebeveynlik, sosyoekonomik durum üzerindeki pozitif etkilerinden dolayı, ülkelerin politik ve ekonomik gündemlerinde, sivil toplum kuruluşlarının programlarında yer almıştır. Anne-babalara çocuklarıyla ilişkilerinde yol göstermek ve çocuğun gelişimine katkı sağlamak adına anne-baba destek programları yıllardır varlığını sürdürmektedir. İsrail 1960'lardan beri bu amaçla "*Home Instruction Program for Preschool Youngsters"* isimli bir program uygulamaktadır. Programın amacı çocukların eğitim çıktıları üzerinde eğitimli annelerin etkisini görmektir. Program kapsamında, anneler çocuklarıyla oyun oynamakta, ev içi aktiviteler yapmakta ve onlara kitap okumaktadır. Sonuç olarak bu aktivitelerin çocukların sosyal, duygusal ve bilişsel gelişimlerine olumlu etkisi olduğu gözlemlenmiştir. Türkiye'de ise 1993 yılında kurulmuş olan Anne Çocuk Eğitim Vakfı (AÇEV) en önemli sivil toplum kuruluşlarındandır. Vakıf, çocukların gelişimine katkıda bulunmak için anne, baba ve çocuklara yönelik pek çok proje ve program geliştirmektedir. Bu anlamda, hem resmi kurumların hem de sivil toplum kuruluşlarının ebeveyn davranışlarını iyileştirmeye yönelik çabaları, ebeveynlerin çocuklarıyla geçirdikleri zamanın önemini ortaya koymaktadır. Özellikle Türkiye gibi erken çocukluk eğitimine kayıt oranlarının çok düşük olduğu ülkelerde (2013 yılı Dünya Bankası göstergelerine göre Türkiye'de %28), ailenin ve ev ortamının önemi daha da artmaktadır.

Ebeveynlerin çocuğa ne kadar zaman ayıracağı ise pek çok faktör tarafından belirlenir. Bunlar eğitim seviyesi, çalışma durumu, gelir düzeyi, çocuk sayısı, çocuğun yaşı gibi değişkenlerdir. Bunları genel olarak anne-babanın kişisel özellikleri, hanenin özellikleri ve çocuğun kişisel özellikleri başlıkları altında toplayabiliriz.

Bu çalışmada anne-babanın çocuğuna ayırdığı zaman üzerinde durulmaktadır. Çalışma, ebeveynlerin eğitim düzeyinin çocuklarına ayırdıkları zaman üzerinde bir etkisi olup olmadığını değerlendirmeyi amaçlamaktadır. Bunun yanında, gelir düzeyi, çalışma durumu, yaş gibi diğer değişkenlerin de bu zaman üzerinde etkisi olup olmadığı da analiz edilmektedir. Ebeveynlerin çocuklarıyla geçirdiği zaman gelişmiş ülkelerde zaman kullanım verisiyle çokça çalışılmış olsa da Türkiye'de böyle bir çalışma gerçekleştirilmemiştir. TÜİK'in 2006 Zaman Kullanım Anketi Türkiye'de zaman kullanımının araştırılmasının önünü açmıştır. Bu çalışmanın amaçları:

1. Ebeveynlerin çocuklarına ayırdıkları zamanı değerlendirme ve anne-babanın zaman kullanım farklılıklarını gözlemlemek,
2. Ebeveynlerin çocuklarına ayırdıkları zamanı etkileyen faktörleri belirlemek,
3. Anne-babanın eğitim seviyesi ile bu zaman arasındaki ilişkiyi tanımlamak,
4. Anne-babanın eğitim düzeyi dışında çalışma durumu, yaş gibi diğer faktörlerin çocuklarına ayırdıkları zamana etkisini belirlemektir.

Bu çalışmada kullanılan veriler, TÜİK tarafından 1 Ocak – 31 Aralık 2006 döneminde yapılan Zaman Kullanım Anketinden alınmıştır. Bu ankette 15 yaş ve üstü her bir bireyin hafta içi bir ve hafta sonu bir olmak üzere iki günlüğü bulunmaktadır. Bunun yanında, kişisel bilgileri ve hane bilgilerini de içermektedir.Bireyler 24 saat boyunca on dakika aralıklarla bu günlükleri tutmuş, yaptıkları aktiviteler ise şu kategoriler altında toplanmıştır: Kişisel bakım, istihdam, eğitim, hane ve aile bakımı, gönüllü işler ve toplantılar, sosyal yaşam ve spor, hobiler ve oyunlar, kitle iletişim araçları, uyku, seyahat ve tanımlanmamış zaman. Çocuk bakımı ise bunlar arasında hane ve aile bakımının içinde yer almaktadır ve çocuğun fiziksel bakımı ve kontrolü, çocuğa eğitiminde ve oyunlarda eşlik etme, çocukla zaman geçirme gibi aktiviteleri içerir.

Bu veriler, her ay 390 haneden alınmak üzere toplamda 16413 kişiyi kapsamaktadır. Bu çalışmada ise 18 yaşından küçük en az bir çocuğu olan çekirdek

aileler ele alınmıştır. Bu durumda anne, baba ve çocuk gözlem sayıları sırasıyla 2082, 1954 ve 4204'tür.

Bu çalışmanın temel olarak ilgilendiği şey, anne-babaların gün içerisinde çocuklarına ayırdıkları zamandır. Kullandığımız veride harcanan zamanın kalitesi konusunda bilgi olmamakla beraber (ebeveyn ve çocuğun birlikte yaptıkları aktivitelerin ne olduğu veride belirtilmemiştir) ebeveynlerle geçirilen zamanın çocukların beşeri sermayesini arttırdığını varsaymaktayız. Ayrıca, verinin bir diğer sınırlaması da ikincil aktivitelerin görülemiyor olmasıdır. Herhangi bir aktivitede bulunurken ebeveyn çocuğuyla da ilgilenebilmektedir. Örneğin, anne-baba yemek yaparken bir yandan çocuğuyla konuşabilmektedir. Fakat bu zaman sadece yemek yapmaya ayrılmış olarak görülmektedir.

Bu çalışma, Türkiye'de ebeveynlerin eğitim düzeyi ile çocuklarıyla geçirdikleri zamanı inceleyen ilk araştırmalar arasında yerini almayı amaçlamaktadır. Ayrıca, ebeveynlerin çocuklarıyla geçirdiği zamanı etkileyen diğer faktörleri de tartışmaktadır. Bunun sonucu olarak bu çalışma aile ve çocuklara yapılan yatırım ile ilgili çalışmalar yürüten araştırmacılara bir yol açacak, politikacıların aile ile ilgili uygun politikaları geliştirmesine yardımcı olacaktır.

Her ne kadar son yıllarda erkeklerin ev işlerine ayırdıkları zaman artsa da (Cohen, 2004), evdeki işbölümünde bariz bir cinsiyetçilik varlığını sürdürmektedir. Kadınların iş gücüne katılımı artıyor olsa da ev işlerinin önemli kısmını kadınlar yapmaya devam etmektedir. Erkekler ise ev işlerinde daha az sorumluluk almakta, çocuklarıyla da daha az zaman geçirmektedir. Başka bir deyişle, çocuk bakımı açıkça cinsiyetçi bir aktivitedir (Gracia, Ghysels ve Vercammen, 2011).

Bu çalışmanın bağımlı değişkeni çocuğa ayrılan zamandır. Bunun için ebeveynlerin çocuklarıyla geçirdikleri zaman ailedeki çocuk sayısına bölünmüştür. Fakat bu zamanın sıfır olduğu gözlem sayısının çok olması, bu değişkenin sağa yatık bir dağılıma sahip olmasına neden olmaktadır. Bu yüzden, bağımlı değişken olarak çocuklara ayrılan zamanın logaritması kullanılmıştır. Böylece, en azından zaman ayıran ebeveynler için normal dağılım elde edilmiştir. Ayrıca haftaiçi, haftasonu ve

ortalama zamanı etkileyen faktörler her iki ebeveyn için de ayrı regresyonlarda incelenmiştir. Çalışmanın bağımlı değişkenleri hafta içi, hafta sonu ve bu iki günün ortalaması olarak bir çocuğa ayrılan zamandır.

Bağımsız değişken olarak ebeveynlerin ve hanenin özellikleri kullanılmıştır. Ebeveyn özellikleri ebeveynin eğitim durumu, yaşı, çalışma durumu ve sağlık durumu değişkenlerini içerir. Ebeveynlerin çalışma durumu ve sağlık durumu 1 veya 0 değerlerini alan kukla değişkenlerdir. Çalışan ve sağlık durumu iyi olan ebeveynler için 1, diğer durumlarda 0'dır. Çalışan ebeveynlerin özel sektörde veya kamu sektöründe çalışıyor olması zaman ayırma kararlarını etkileyebileceğinden bağımsız değişken olarak eklenmiştir. Bu değişken kamu sektöründe çalışan ebeveynler için 1, özel sektörde çalışan ebeveynler için 0 değerini almaktadır. Aynı sebeple ebeveynin ücretli çalışan olup olmadığı, kendi işini yapıp yapmadığı veya ücretsiz aile işçisi olması da kukla değişkenler olarak eklenmiş, ücretsiz aile işçisi referans grup olarak seçilmiştir. Yaş değişkeni ise sürekli değişkendir. Yaşla çocuğa ayrılan zaman arasındaki ilişkinin lineer olup olmadığını inceleyebilmek için "yaşın karesi/100" değişkeni de eklenmiştir.

Çalışmanın esas ilgilendiği nokta olan ebeveynlerin eğitim düzeyi ise beş gruba ayrılmıştır; okuma-yazma bilmeyen veya hiç okula gitmemiş, ilkokul mezunu, ortaokul mezunu, lise mezunu, üniversiteden veya daha ileri dereceden mezun. Bu değişkenler arasından da okuma- yazma bilmeyenler veya hiç okula gitmemiş olanlar referans grup olarak seçilmiştir.

Kendig ve Bianchi (2008), eşi olmayıp çocuğunu kendisi büyüten anne/babanın artan sorumluluklar ve ekonomik kaygılar sebebiyle çocuklarıyla daha az zaman geçirdiklerini göstermiştir. Bu yüzden hanede eşin olması ve sorumlulukların paylaşılması ebeveynin farklı aktivitelere ayırdığı zaman üzerinde etkilidir. Ayrıca annenin(babanın) çocuk bakımına ayırdığı zaman üzerinde babanın(annenin) özeliklerinin etkisini tartışan çalışmalar olduğundan (Hill ve Stafford, 1980; Gimenez- Nadal ve Molina, 2013); hanede eşin olup olmadığı, varsa

da, eşin eğitim durumu, çalışma durumu ve sağlık durumu değişkenleri de bağımsız değişken olarak eklenmiştir.

Bunların yanı sıra çocukların yaş ve cinsiyeti ve hanenin özellikleri de bireylerin ayırdığı zamanı etkileyeceğinden bağımsız değişken olarak eklenmiştir. Hanedeki 0-2, 3-5, 6-14 ve 15-17 yaş grubunda kız ve erkek çocuklar toplam çocuk sayısına bölünmüş, böylece sekiz farklı değişken elde edilmiştir. Referans grup olarak ise 15-17 yaş grubundaki kız çocuklarının sayısının toplam çocuk sayısına oranı kullanılmıştır. Hane özelliklerinden ilki olan hanenin refah seviyesi, temel bileşenler faktör analizi (principal components analysis) kullanılarak belirlenmiş ve 1 ila 5 arasında bir değer almıştır. Refah seviyesi için de beş farklı değişken yaratılmış, refah seviyesi en düşük olan grup referans olarak seçilmiştir. Hane özelliklerinin diğeri ise ailenin kır/kent bölgesinde yaşamasıdır. Becker (1993)'a göre kırsal bölgede yaşayan aileler tarımla uğraştıklarından daha çok sayıda çocuk yapmaktadır. Ayrıca da çocukların gelişimini göz ardı etmektedir. Bu sebeple kır/kent bölgesinde yaşama kukla değişken olarak regresyona eklenmiş, kırsal bölgelerde yaşayan ebeveynler için 1, kentlerde yaşayan ebeveynler için 0 değerini almıştır.

Literatürdeki çalışmalarda zamanı etkileyen değişkenleri incelemek için Tobit model veya çift engelli model (double hurdle model) kullanılmıştır. Bu çalışmada ise çift engelli model tercih edilmiştir. Bu model iki aşamalıdır; ilk aşamada anne babaların çocuğa zaman ayırma kararlarını etkileyen değişkenler test edilirken ikinci aşamada ebeveynlerin ayırdıkları süreyi etkileyen değişkenler test edilir.

İlk aşamaya baktığımızda, ebeveynlerin eğitim seviyesinin çocuk bakımına zaman ayırma kararına etkisi çok fazla gözlemlenememektedir. Sadece üniversiteden veya daha yüksek dereceden mezun olmanın anne ve babanın zaman ayırma ihtimalini arttırdığı görülmüştür. Okula gitmemiş babalara göre üniversiteden veya daha yüksek bir okul derecesine sahip babaların hafta sonu çocuklarına zaman ayırma ihtimali 14 yüzde puan fazla iken aynı durumdaki anneler

için bu ihtimal hafta içi 15 yüzde puan daha fazladır. Diğer yandan üniversite mezunu eşin olması da hafta sonu zaman ayırma ihtimali üzerinde etkilidir. Üniversite mezunu eşi olan erkeklerin zaman ayırma olasılığı hafta sonu 13,6 yüzde puan artarken, kadınlar üniversite mezunu eşe sahip olduklarında zaman ayırma olasılığı hafta sonu 12,4 yüzde puan azalmaktadır.

Ebeveynlerin diğer özelliklerine bakıldığında yaşın sadece annenin zaman ayırma olasılığı üzerindeki etkisi görülmektedir. Kadınların zaman ayırma olasılığı her yeni yaşla 2 yüzde puan azalmaktadır ve bu azalma artandır. Diğer yandan çalışan kadınların çalışmayan kadınlara göre hafta içi çocuklarına zaman ayırma olasılığı 13 yüzde puan daha fazladır. Çalışan kadınlar arasında ise kamu sektöründe çalışan kadınların özel sektörde çalışan kadınlara göre zaman ayırma olasılığı hafta sonu 13 yüzde puan daha fazladır. Özel sektör daha yoğun iş saatlerine sahip olabildiğinden bu beklenen bir sonuçtur. Çalışan kadınların zaman ayırma olasılığını etkileyen bir diğer değişken de kendi hesaplarına çalışıp çalışmadıklarıdır. Kendi hesabına çalışan kadınların hafta sonu çocuklarına zaman ayırma olasılığı, ücretsiz aile işçisi kadınlara göre 12 yüzde puan daha fazladır.

Hanede eşin olması ve eşin çalışma durumunun ise sadece kadınların zaman ayırma olasılığını etkilediği görülmüştür. Hanede eşi olan kadınların zaman ayırma olasılığı hafta içi 14, hafta sonu ise 11 yüzde puan azalmaktadır. Hanede eşi olan kadınlar bu sorumluluğu eşleriyle bölüşmektedir. Fakat kadınların zaman ayırma ihtimali eşlerinin çalışıyor olması durumunda artmaktadır. Zaman ayırma ihtimalleri çalışmayan eşe sahip kadınlara göre hafta içi 7,6 yüzde puan, hafta sonu ise 13,5 yüzde puan daha fazladır.

Çocuğun yaş ve cinsiyet özellikleri incelendiğinde, çocuğun yaşının hem annenin hem babanın zaman ayırmasında istatistikî olarak önemli olduğu görülmüştür. Fakat erkek ve kız çocuk arasında bir farklılık gözlemlenememiştir. 15-17 yaş grubundaki kız çocuklarıyla karşılaştırıldığında, anne babanın 15 yaşından küçük çocuklarına zaman ayırma olasılığı hem kız için hem de erkek için daha fazladır ve bu istatistikî olarak anlamlıdır. Küçük yaştaki çocuklar ebeveynleriyle

daha çok zaman geçirmek zorundadır, bunun doğal bir sonucu olarak da küçük çocuklara zaman ayırma olasılığı en yüksektir.

Çift engelli modelin ikinci aşamasında ise anne babaların çocuklarına ayırdıkları süreyi etkileyen değişkenler test edilmiştir. İkinci aşama, bağımlı değişkenleri pozitif olan ebeveynleri ele almaktadır, bu yüzden gözlem sayısı daha düşüktür. Çalışmanın öncelikli amacı ebeveynlerin eğitim düzeyinin çocuklarına ayırdıkları zamana etkisini test etmektedir. Bu sebeple öncelikli olarak anne babanın eğitim seviyesi test edilmiş ve hem anne için hem de baba için eğitim seviyesinin istatistikî olarak anlamlı olduğu görülmüştür. Okumamış veya hiç okula gitmemiş ebeveynlere göre, herhangi bir eğitim almış ebeveyn çocuğuyla daha çok zaman geçirmektedir. Okuma-yazma bilmeyen veya hiç okula gitmemiş babalara göre ilkokul mezunu babalar çocuklarına ortalama olarak %54, ortaöğretimden mezun olanlar %52, liseden mezun olanlar %64 ve üniversiteden veya daha ileri seviyeden mezun olan babalar ise %81 daha fazla zaman ayırmaktadır. Bu durum anneler için de aynı şekilde gözlemlenmiştir. Okuma-yazma bilmeyen veya hiç okula gitmemiş annelere göre ilkokul mezunu anneler çocuklarına ortalama olarak %19, ortaöğretimden mezun olanlar %44, liseden mezun olanlar %32 ve üniversiteden veya daha ileri seviyeden mezun olan babalar ise %30 daha fazla zaman ayırmaktadır.

Literatürde annelerin eğitim düzeyinin çocuklarla geçirilen zaman üzerindeki etkisi daha fazla incelenmiştir, bunun sebebi annenin eğitim düzeyinin erkeklerin zamanını da etkiliyor olmasıdır. Bu çalışma, bunu destekler niteliktedir. Annelerin eğitim düzeyinin babaların çocuklarıyla geçirdiği zaman üzerinde istatistikî olarak pozitif ve anlamlı bir etkisi vardır. Okuma yazma bilmeyen veya hiç okula gitmemiş eşe sahip erkeklere göre eşi ilkokul mezunu olan erkekler çocuklarıyla hafta içi %27, eşi ortaokul mezunu olanlar %35, lise mezunu olanlar %46 ve üniversite mezunu olanlar %56 daha çok zaman geçirmektedir. Görüldüğü gibi, artış eğitim düzeyiyle monotondur. Annelerin eğitim düzeyi arttıkça babalar çocuklarıyla daha çok zaman geçirmektedir. Bu sebeple annelerin eğitim düzeyi iki açıdan önemlidir; hem daha

eğitimli anneler çocuklarıyla daha çok zaman geçirmektedir, hem de eğitim seviyesi yüksek eşe sahip babalar çocuklarıyla daha çok zaman geçirmektedir.

Eğitim dışındaki ebeveyn özelliklerine bakılırsa, yaş, çalışma durumu, çalışan ebeveynler için iş türü ve sektörü ve hanede eşin olup olmamasının anne babaların çocuklarına ayırdıkları zamanı etkilediği görülmüştür. Anne babalar yaşlandıkça çocuklarına ayırdıkları zaman artan bir şekilde azalmaktadır. Yaş, babalar için hafta içi ayırdıkları zamanda, anneler için ise hafta sonunda ayırdıkları zamanda istitatistiki olarak anlamlıdır. Ebeveynlerin yaşlarının çocuklarına ayırdıkları zaman üzerindeki negatif etkisini çocukların da büyümesiyle açıklamak mümkündür. Anne babaların yaş ortalaması artarken çocuklarınki de artmakta, bu sebeple ayırdıkları zaman da azalmaktadır. Çalışma durumu babaların zamanını arttırırken annelerin zamanını azaltmaktadır. Çalışan babalar, çalışmayan babalara göre hafta içinde çocuklarına %50 daha fazla zaman ayırmaktadır. Çalışan annelerin ayırdığı zaman ise hafta içi %64, hafta sonu %38 azalmaktadır. Çalışan annelerde ise kamu sektöründe çalışan anneler daha düzenli çalışma saatlerinden dolayı çocuklarına daha çok zaman ayırabilmektedir. Kamu sektöründe çalışmanın istatistiki olarak pozitif etkisi görülmektedir. Bunun yanı sıra, hanede eşin olması hafta içi erkeklerin ayırdığı zamanı azaltırken kadınların ayırdığı zamanı arttırmaktadır. Eşin çalışması durumunda da kadınların hafta sonu ayırdıkları zaman artmaktadır.

Çocuğun yaş ve cinsiyetinin anne babaların zamanı üzerindeki etkisine bakıldığında, babaların çocuklarıyla geçirdiği zaman üzerinde ne çocuğun yaşının ne de cinsiyetinin bir etkisi bulunamamıştır fakat annenin çocuğuyla geçirdiği zaman çocuğun yaşıyla beraber azalmaktadır.

Hane özellikleri incelendiğinde, hane özelliklerinin esas olarak annelerin çocuklarına ayırdıkları zamanı etkilediği görülmüştür. Refah seviyesi en düşük kadınlara göre yüksek refah seviyesindeki kadınlar çocuklarına daha çok zaman ayırmaktadır. Ayrıca kırsal bölgelerde yaşayan kadınların da çocuklarıyla ortalama

olarak daha az zaman geçirdiği görülmüştür. Kentte yaşayan annelere göre kırsal bölgelerde yaşayanlar çocuklarıyla %17 daha az zaman geçirmektedir.

Sonuç olarak bu çalışmanın odak noktası ebeveynlerin eğitim düzeyinin çocuklarına ayırdıkları zaman üzerindeki etkisidir. Eğitim seviyelerinin çocuklara zaman ayırma kararında bir etkisi gözlemlenmezken (üniversite ve daha yüksek eğitim hariç), zaman ayıran ebeveynlerin ayırdığı süre eğitimli ebeveynler için daha yüksektir. Eğitimli bireyler, çocukla zaman geçirmenin çocuğun gelişimi ve eğitimi üzerinde olumlu etkisinin farkında olduklarından çocuklarına daha çok zaman ayırmaktadır. Ayrıca kadının eğitim seviyesinin daha önemli olduğu görülmüştür çünkü kadının eğitimi sadece kendi zamanını değil, babanın çocuğuyla geçirdiği zamanı da pozitif olarak etkilemektedir.

Bu çalışma Türkiye'de zaman kullanımı üzerine yapılmış ilk çalışmalardandır. Bu yüzden ileriki zamanlarda da bu konu üzerine çalışmaların genişletilmesi, Türkiye'de zaman kullanım alışkanlıklarının farklı sorularla incelenebilmesi faydalı olacaktır. İleriki çalışmalarda ise, anne babanın çocuğuyla geçirdiği zamanın çocuğun gelişimine katkısı olup olmadığı incelenebilir. Ayrıca TÜİK Zaman Kullanım Anketi çalışmalarını devam ettirirse, bireylerin değişen zaman kullanım alışkanlıkları incelenebilir.

APPENDIX B

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı : Tanrıvere
Adı : Gizem
Bölümü : İktisat

TEZİN ADI (İngilizce) : Parental Education and Time with Children: An Analysis Using 2006 Turkish Time Use Survey

TEZİN TÜRÜ: Yüksek Lisans [X] Doktora [ ]

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. [X]
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. [ ]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: