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Investigation of the Relationship Between the Parental Attitudes Applied by the Parents of Preschool Children and Their Science Learning Skills[1]

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Abstract

The main purpose of this study is to test the relationship between science learning skills of 60-72 months old preschool children attending preschool education and the parental attitudes applied by the parents of these children. The research has a quantitative pattern and relational survey model which is one of the general survey models is used in this study. While the independent variable of the study is the parental attitudes of the parents; dependent variable is children's science learning skills. The research group of the study consists of 395 pre-school children and their parents. In order to collect data, "Personal Information Form", "Parenting Styles and Dimensions Scale" and "Science Learning Assessment Test" are used. Also, correlation analysis is conducted to examine the relationship between the parental attitudes applied by the parents of preschool children and science learning skills. As a result, it is concluded that there is no statistically significant relationship between the science learning skills of 60-72 months old children attending preschool education and attitudes applied by the mothers towards their children. Hierarchical Multiple Regression analysis is used to predict the science learning skills of the preschool children by using the parental attitudes of parents of preschool children and socio-demographic characteristics of the mother. Consequently, the socio-demographic characteristics and attitudes of the mothers are statistically significant in explaining their children's total score obtained from the Science Learning Assessment Test and the Scientific Research Process sub-dimension, but it is concluded that the socio-demographic characteristics and attitudes of the mothers does not explain the sub-dimension of Life Science Concepts in a statistically significant way.

Keywords: *Preschool, parental attitudes, science learning skills..*

[1] *Bu makale, Dr. Öğr. Üyesi Büşra Ergin'in danışmanlığında Vildan Demir tarafından hazırlanan yüksek lisans tezinden üretilmiştir.*

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Okul Öncesi Dönem Çocuklarının Ebeveynlerinin Uyguladıkları Anne-Baba Tutumları İle Bilim Öğrenme Becerileri Arasındaki İlişkinin İncelenmesi*

Öz

Bu araştırmanın temel amacı, okul öncesi eğitim kurumuna devam eden 60-72 aylık okul öncesi dönem çocuklarının bilim öğrenme becerileri ile ebeveynlerinin uyguladıkları anne-baba tutumları arasındaki ilişkinin sınanmasıdır. Araştırma nicel desende olup, genel tarama modellerinden ilişkisel tarama modeli kullanılmıştır. Araştırmanın bağımsız değişkenleri, ebeveynlerinin uyguladıkları anne baba tutumları iken; bağımlı değişkenleri, çocukların bilim öğrenme becerileridir. Çalışma grubunu, okul öncesi eğitimi alan 395 çocuk ve onların ebeveynleri oluşturmaktadır. Verilerin toplanması amacıyla, "Kişisel Bilgi Formu", "Anne-Babalık Stilleri ve Boyutları Ölçeği" ve "Bilim Öğrenmeyi Değerlendirme Testi" kullanılmıştır. Okul öncesi dönem çocuklarının ebeveynlerinin uyguladıkları anne-baba tutumları ile bilim öğrenme becerileri arasındaki ilişkinin incelenmesinde ise korelasyon analizi yapılmıştır. Neticesinde, okul öncesi eğitim kurumuna devam eden 60-72 aylık çocukların bilim öğrenme becerileri ile annelerin çocuklarına uygulamış oldukları tutumlar arasında istatiksel olarak anlamlı bir ilişkinin olmadığı sonucuna ulaşılmıştır. Okul öncesi dönem çocuklarının ebeveynlerinin uyguladıkları anne-baba tutumları ile annenin sahip olduğu sosyo-demografik özelliklerin, çocuklarının bilim öğrenme becerilerini yordamasında ise Hiyerarşik Çoklu Regresyon analizi kullanılmıştır. Sonuç olarak, annelerin sahip olduğu sosyo-demografik özelliklerin ve tutumların, çocuklarının Bilim Öğrenmeyi Değerlendirme Testi'nden elde ettikleri toplam puanı ve Bilimsel Araştırma Süreçleri alt boyutunu istatiksel olarak anlamlı şekilde açıklarken, Yaşam Bilimi Kavramları alt boyutunu istatiksel olarak anlamlı bir şekilde açıklamadığı görülmüştür.

Anahtar Kelimeler: *Okul öncesi, anne baba tutumları, bilim öğrenme becerisi*

Introduction

A newborn baby comes to the world with a certain potential with the genetic features it receives from its parents. The stimuli received by the baby from the mother's womb, besides contributing positively to the development of these potential features, as well as physical, cognitive, psychological, etc. It can also affect the aspects negatively. In this regard, the first living environment and the effects it takes in this environment are extremely effective in determining what the child will be like in the future (Oktay, 2004).

The family institution, which has an impact on the growth and development of the individual throughout its life, is the smallest unit of the society. Since the family, which we call the child's first living environment, is an institution where face-to-face relationships are experienced, it can be stated that discipline understanding and parents' attitudes play an important role in the social and emotional development of children (Dönmezer, 1999). Gordon (1993) states that the effect of parents on the child is very extensive. According to him, parents, who are the closest of all people meeting the needs of their children in the period of 0-6 years, both meet the needs of them and are the first teachers to be effective in their upbringing (Gordon, 1993). Interaction within the family enables the child to develop a feeling of 'I am precious' or 'I am worthless' (Cüceloğlu, 1998). From this point of view, the importance of parent-child relationships is better understood in the development of a healthy personality and adaptation to the environment in which the child resides (Senemoğlu, 2002; Çağdaş and Seçer, 2006; Bacanlı, 2007).

Each child is an independent individual with his unique intelligence and personality traits. In addition to the individual characteristics of the child, the attitude of the parents and the environmental conditions affect his positive and negative behavior and development (Yavuzer, 1998). It is possible for the capacity brought from birth to reach the highest point where it can develop, with appropriate environmental conditions (Çağdaş and Seçer, 2006).

When the literature is examined, it is seen that many definitions are made for attitude. It can be said that behavioral scientists, especially sociologists, psychologists and even political scientists tend to highlight items related to their interests while making this definition. This situation also

causes diversification of the definitions made for the concept of attitude (İnceoğlu, 2004). Robbins (1994) argued that attitudes are positive or negative evaluations about objects, people or events. Chapman (1999) explains the attitude as "*the way the individual expresses his / her own mood to other people*". According to Alport, while the attitude is "*the state of being ready to act rationally and nervously, which creates a guiding or effective power on the individual's reactions and situations against all objects and organized in experimental information*"; Kanz defines "*the tendency to evaluate an icon, an object or an event around the individual in a positive or negative way*". While Lambert explains the attitude as "*an organized and consistent way of thinking, emotion and reaction about the individual, people, groups, social issues and more generally any environmental event*", Doob stated that "*a potential and motivational response to the subjects that are considered important in the society in which the individual lives, on the other hand*", Maier thinks that attitudes represent pre-trends that are effective in forming certain opinions (İnceoğlu, 2004).

All parents have clear or hidden ideals about what their child should be like in the future. Parents try many different methods to direct their children to this goal. They reinforce or punish their children's behavior, use themselves as role models, and choose neighbors, peer groups and schools, which we call the immediate environment to support their values and judgments by explaining their beliefs and expectations. Thus, these different methods adopted and applied by each parent lead to different child-rearing attitudes and behaviors (Argun, 1995). When these attitudes and behaviors are examined, different dimensions come to the fore in the mother-father-child relationship. Acceptance-rejection and audit-autonomy dimensions are the most prominent dimensions that form parental attitudes. Acceptance-rejection dimension; it includes parental behaviors that accept-approve or reject-disapprove. Looking at the accepting parents' attitudes, it is seen that the behaviors and attitudes that are child-oriented, are sensitive to the needs of their children, do not resort to violence, and clearly explain the causes and consequences of the discipline they apply. However the rejection size includes anger, physical punishments, displaying attitudes such as dislike of the child, acting indifferent, loveless and being destructive in criticism. Audit-autonomy dimension includes the permissive and restrictive attitudes of parents in applying and maintaining their rules of conduct. We can express parents' attitudes which will negatively affect the develop-

ment of children as overly strict and controlling or overly tolerant and uncritical attitudes (Saruhan 1996; Tola 2003; Döğücü 2004). As a result of these dimensioning studies, the attitudes adopted by parents are classified.

In this study, based on Baumrind; authoritative, authoritarian and permissive attitude of parents is based. Authoritative parenting is also called strict parenting. There is very little dialogue between parents with this attitude. Parents have high expectations of the child. Such parents control their children, but they do not listen to them, they are restrictive, they are punitive (Bacanlı, 2007). This attitude can be in the form of threatening or using physical violence, as well as withholding love, ignoring the child by disconnecting communication or making humiliating comparisons (Yavuzer, 2006). Looking at the authoritative attitude, democratic parents are good guides to their children. They politely describe their behaviors and the rules they must follow. They convey the behaviors that should not be done to the child with their reasons. For this reason, it has been stated that children raised with a competent parental attitude are raised as a self-confident, tolerant, open-minded, socially compatible person who can respect themselves and their environment, know their limits, be creative, active, sociable and positive (Bacanlı, 2007; Yılmazer, 2007; Olcay, 2008). On the other hand, Cüceloğlu (1992) states that tolerant parents do not see their children as a tool to fulfill their own needs. It states that the normal tolerance of parents to their children is very important for the child's self-confidence (Yavuzer, 2008). However, when the parents' tolerant attitude is not normal, it can lead to negative attitudes and behaviors of the child. Yörükoğlu (2000) states that parents with excessively tolerant attitude give their children numerous rights. These parents actually confuse being tolerant and giving up. These parents can cause their children to develop selfish feelings (Yörükoğlu, 2000; Yavuzer, 2008).

Until now, parental attitudes have been mentioned in general and it has been deemed necessary to refer to the concept of motherhood as our research focuses on mothers. The concept of motherhood can be explained as reaching "*emotional maturity*" and "*parenting consciousness*" that women can adopt motherhood (Yavuzer, 2013). Bilge (1979) explains the concepts of femininity and motherhood and the basics of being ready for motherhood with the following expressions: "*Pregnancy is a femininity function that starts with 'fertilization', ends with 'birth' and covers a period of 280 days. While per-*

forming this function, a series of physical and spiritual changes take place in the woman, moving her from 'woman' to 'mother'. The transformation of women into 'mothers' has increased from an evolutionary step to a higher level of evolution in terms of biological, spiritual and social aspects. This rise starts with femininity functions and sexual instincts and continues with maternal instincts and maternal functions that develop accordingly" (Bilge, 1979). As a guide, development and change in "*mother*" as a parent will undoubtedly have an important role in raising our future generations as "*questioning*" and "*researching"* individuals (Yavuzer, 2013). In addition, the mother's work can affect the attitude of raising children. As stated by Yavuzer (2006), it is seen that the ones who can be explained as the least satisfied among the parents and who are in the greatest spiritual depression are mostly in the group of mothers who have children at a young age and do not work. It emphasizes that this dissatisfaction can be largely due to the weight of the duties and responsibilities that the role of caring brings to the mothers and therefore to restrict maternal life and behavior (Yavuzer, 2006: 122). According to psychologist Hoffman, mothers engaged in "*full-time housewife"* adopt an authoritarian and freeing attitude compared to 'full-time working' mothers. This type of mothers show their behaviors on establishing authority and showing their power more. However, working mothers encourage their children to be "*independent*" more (Yeşilyaprak, 2003).

When the literature is analyzed for the definition of science, it is seen that many definitions are made about science, but there is no common and simple science definition agreed. According to Çepni (2014), science can be defined as the process of thinking right, researching the truth and information, obtaining systematic information using scientific methods and organizing the information efforts to understand and define the universe. According to another definition, science is a regular and systematic knowledge that people obtain through neutral observation and controlled experiments (Topsakal, 1999). According to some researchers, science is defined as studies conducted through scientific research processes (Canpolat and Pınarbaşı, 2002; Worth, 2010). Science in a nutshell is the way of seeing the World, the way of thinking, and problem solving. According to the nature of science, the scientist cannot know the answer to everything, because scientific knowledge is variable. At any moment, a new scientific discovery can lead to radical changes in the world's explanation (Jarrett, 2013).

People are constantly in a position to recognize themselves and those around them, explain what is going on around them and try to find solutions to the problems they face. Finding the right solution to the problems depends on making the right decisions, and making the right decisions depends on using the right information (Karasar, 2015). In this context, it is certain that people need the light of science to make better decisions and they should feel the rational dimension of science (Atasoy, 2004). Scientific thinking skills should be developed in order to provide progress in the field of science to comply with these advances and to provide effective solutions against the problems encountered in this process in an ever-evolving and changing World (Celep, Gültekin, Karamustafaoğlu, and Karamustafaoğlu, 2012). That is why students are expected to be individuals who ask, wonder and investigate the reason, catch contradictions and inconsistencies, make observations and good conclusions from good observations, have scientific thinking, entrepreneurial, creative, multi-faceted thinking, decision-making skills, responsibility, express knowledge, do not memorize but who know how to access, use, share and produce information (Akar, 2007). In order for children to discover and understand the world around them, the National Science Teachers Association actually emphasizes the need to actively engage young children in exploratory science-related games from birth. NSTA states that focusing on learning science from kindergarten should be as much as going to secondary and high school. Current research shows that young children have the ability to learn and judge conceptually through research practices (National Research Council, 2007; 2012). Montessori (2016) makes the definition as follows, while emphasizing that the scientist is not a person who can use physical devices in the laboratory or create different chemical reactions, and can prepare organic tissue slides for microscope examination; "*We can define the scientist as a person who can see something that will lead to a closer look at the deeper realities of life during an experiment, who uncovers these amazing secrets, always catching knowledge, and who has passionate love that he forgets himself beyond mysteries of nature*" (Montessori, 2016). For this reason, the scientist is not the person who can use different tools, but the person who knows nature. This is how nature opens its secrets to these people and crowns them with the victory of inventions. That is, the "*spirit*" of the scientist is beyond his mechanical skills, and his mental attitude reaches a climax in his field when he exceeds his mechanical skills.

Science is enriched not only by natural discoveries, but also by new philosophical syntheses (Montessori, 2016). One of the main goals of the modern education system is to raise individuals who have knowledge, skills, attitudes and understanding related to science and who can also solve problems. In this context, the definition of science is expressed as studies conducted through scientific research processes (Canpolat and Pınarbaşı, 2002; Worth, 2010).

As many researchers have noted, "*children are natural scientists*" (Edwards, 1998; Aktaş Arnas, 2002; Tan and Temiz, 2003; Bosman, 2006; Ayvacı, 2010; Çabuk and Haktanır, 2010; Alabay, 2011; Dubosarsky, 2011; Durbin, Pickett, and Powell, 2011; Ergül, Şimşekli, Çalış, Özdilek, and İlkörücü Göçmençelebi, 2011; Uyanık Balat, 2011; Bryant et al., 2012; Büyüktaşkapu, Çeliköz, and Akman, 2012; Campell and Jobling, 2012; Nuhoğlu and Ceylan, 2012; Atasoy and Zoroğlu, 2014; Gözün Kahraman, Ceylan and Ülker, 2014). The name of the exciting stirring in the child is "*a sense of curiosity*" and "*eagerness to imitate*". Although the guide, who responds to the feeling of curiosity, finds an adult, he can reveal his superior talents arising from being human (Güneş, 2013). Children's acquaintance with science coincides with early childhood (Hamurcu, 2003). Children in early childhood are "*active learners*" (Demirtaş and Sucuoğlu, 2009). As a result of this active relationship with science, children see themselves as science students, active participants in science and begin to develop a positive attitude towards science (Mantzicopoulos, Patrick, and Samarapungavan, 2009).

During the preschool period, children's inherent curiosity leads them to find answers to the situations and events they are curious about by observing and using the objects around them. Thanks to these experiences, children begin to understand that natural phenomena can be observed, measured and sometimes controlled. Thus, scientific process skills begin to be formed (Durbin, Pickettn, and Powell, 2011). Because they use all these processes, children are called "*congenital scientists*" (Çabuk and Haktanır, 2010). Although there are no sharp boundaries between development periods, the acquisition of scientific knowledge, science-related concepts and scientific process skills of children may differ according to age and development characteristics (Yurt, 2013). The content of science for children is to make sense of the basic concepts and understand the relationships between the concepts, and to participate in science studies by actively using the skills of

scientific processes (Worth, 2010). In this process, children gather information from early ages, organize and classify them, combine them in a way they can base on logic, and construct simple theories to explain the world. Therefore, science is the most important tool in satisfying children's inborn curiosity (Dubosarsky, 2011). The first educational environment in which children respond to their inner curiosity is family (MEB, 2013). As Tolstoy (2015) said; "*Children are alike in every corner of the earth. However, the parents who educate them are very different*."

Therefore, it is thought that parental attitudes, which have such importance on children, may affect the sense of curiosity, which is a potential feature of children. In this context, the research was planned and conducted to examine the relationship between the parents' attitudes and science learning skills applied by preschool children. In line with this basic purpose, answers to the following questions were sought;

1. Are the science learning skills of 60-72 months old children attending pre-school education institution significantly related to their parents' attitudes towards their children?
2. Does the socio-demographic characteristics of the mothers of 60-72 months old children attending the pre-school education institution and the parents' attitudes applied explain the science learning skills of their children significantly?
   a) Does the socio-demographic characteristics and parents' attitudes of the mothers of children attending pre-primary education institutions explain their child's overall assessment of science learning significantly?
   b) Does the socio-demographic characteristics of the mothers of the children attending the pre-school education institution and the parental attitudes they have applied explain their children's scientific research process subtest scores significantly?
   c) Does the socio-demographic characteristics of the mothers of the children attending the pre-school education institution and the parental attitudes they have applied significantly explain their children's life science concepts subtest scores?

Method

The study is a quantitative research and relational survey model is used. While the independent variable of the study is the parental attitudes of the

parents; Dependent variable is children's science learning skills. In this way, the subject of the research is tried to be described according to the data obtained and to what extent the variables determined are related to the situation.

Survey model; is a research approach that aims to describe and define what a situation existed in the past or present is. There is no attempt to change or influence the subject of the research. The thing wanted to be known is there. The aim is to be able to observe and identify that thing correctly. The main objective is to observe without attempting to change (Karasar, 2015). In the survey model, there is observation, recording, detection of relations between events and generalizations on invariant relations of science. In other words, the descriptive function of science is in the foreground (Yıldırım, 1966, p.67).

The relational survey method is used to determine relationships between variables and to predict possible outcomes. The relationship between two or more variables is measured using statistical tests. Correlation test is used to determine the level of relationship. Correlation reveals whether two or more variables (individually) show a consistent change together. Regression analysis is performed when the power of the relationship between two or more variables is revealed. Regression analysis is performed by calculating the correlation coefficient between the variables to reflect the change in one variable in the other (Metin, 2014).

Research Group

In the 2017-2018 academic year, 49 independent kindergartens affiliated to the Ministry of National Education located in the central districts of Konya (Selçuklu, Meram, Karatay), 16 kindergartens of 190 primary schools and 156 secondary schools that have kindergartens content are designated as study group by random cluster sampling (Ministry of Education Konya Provincial Directorate of National Education, 2019). In the schools determined as a result of random cluster sampling, random element sampling is conducted and the children to be included in the research group are determined. As a result, the sample of the study consisted of 395 60-72 months old children and their mothers. Children in the school are not included in

the study if they are far from representing the group and have any disabilities.

Data Collection Tools

In order to collect data related to research; "*Personal Information Form*" prepared by the researcher containing general information about mother, father and child, "*Parenting Styles and Dimensions Scale*" developed by Robinson, Mandleco, Olsen, and Hart (2001) to measure the attitudes of parents and their suitability for use in Turkish mothers by Kapçı and Erdinç-Demirci (2009) and "*Science Learning Assessment Test*" developed by Samarapungavan, Mantzicopoulos, Patrick, and French (2009) in order to measure the science learning skills of children which the validity and reliability study of the Turkish form conducted by Yurt (2013) are used.

Personal Information Form: Personal Information Form consisting of a single part is used in the research. The personal information form includes information about the age, education level, occupation and total number of children of the mothers and the monthly income level of the family.

Parenting Styles and Dimensions Scale: Developed by Robinson et al. (2001) based on Baumrind's classification called the Parenting Styles and Dimensions Scale evaluates the attitudes of parents with children aged 2-13 years and evaluated the appropriateness of the scale's use in Turkish mothers by Kapçı and Erdinç-Demirci (2009) and obtained the necessary permission via e-mail from them. The original scale, called "*Parenting Styles and Dimensions Scale* ", consisted of 62 items. However, as a result of the studies carried out in the following years, the number of items in the scale was reduced to 32. The scale consists of 32 items and is evaluated with a 5-point rating, ranging from "*1 = Never*" to "*5 = Always*".

The scale which of the validity and reliability is conducted by Kapçı and Erdinç-Demirci (2009) has 4 different versions as: mother form, father form, the form that mother evaluates her husband and the form that father evaluates his wife. These four versions consisted of 3 factors. The first factor that measures competent and democratic parenting is called "*authoritative*" and consists of a total of 15 items (for example, "*I am sensitive to my child's feelings and needs*"). The second factor (authoritarian) that measures authoritarian

parenting is a total of 12 items (for example, "*I use physical punishment to discipline my child*"). The third factor consists of 5 items and is called "*Permissive*" (For example, "*I say I will punish my child but I do not actually punish my child*"). The first factor consists of three sub-factors called "*warmth and support*", "*reasoning and induction*" and "*democratic participation*". Authoritarian parenting factor consisted of "*physical pressure*", "*verbal hostility*" and "*non-disclosure punishment*"sub-factors, and the permissive factor consist of "*permit*" subfactor. The internal consistency of the scale that is evaluated by Cronbach Alfa is calculated as .88 for the authoritative factor, .74, for the "*authoritarian*" factor, and .64 for the so-called non-disclosure permissive factor. Test-retest stability is evaluated with measurements obtained from a total of 43 mothers at two-week intervals and this value is found to be .64 ($p < .0001$) (Kapçı and Erdinç-Demirci, 2009).

Scientific Learning Assessment Test: The Science Learning Assessment Test was developed by Samarapungavan et al., (2009) for children attending kindergartens in public schools in Midwestern (n= 100). The test aims to evaluate the science learning of preschool children. The Science Learning Assessment Test consists of two sub-tests that measure children's scientific research processes and life science concepts. Scientific Research Processes subtest consists of 9 items and Life Sciences subtest consists of 15 items. The test consists of 24 items totally.

Scientific Research Processes [SRP] subtest; consists of 9 items that include understanding the experimental basis of science, using simple tools to collect, record, analyze and share data by understanding and seeing science as a research process by evaluating similarities between scientific ideas or basing on experimental evidence by asking and predicting questions about natural life.

Life Science Concepts subtest consists of 15 items that include understanding of the characteristics of living beings, understanding of the existence of certain structures and features such as physical and behavioral characteristics that help animals and plants to live, grow and reproduce (Yurt, 2013).

The test is conducted in a format in which children are shown individual pictures of each item and the questions are asked by the researcher and the children can answer verbally or by pointing to the correct pictures. If the

child's answer is not certain, the person performing the test continues by asking the child to repeat the answer. If the child cannot answer, the tester repeats the question once more. If there is still no answer, the question is passed. The test is administered individually and lasts between 15 and 25 minutes on average. A binary coding system is used to evaluate the test. "0" points are given to the wrong answers or items left blank and "1"points are given to the correct answers. Thus, total test values vary between 0 and 24 points (Yurt, 2013).

The Cronbach Alpha (α) value is found to be .71 in the internal consistency reliability analysis of 9 items in the Scientific Research Processes subtest for the original test and .70 was found to be in the internal consistency reliability analysis of 15 items in the Life Sciences subtest. In the internal consistency reliability analysis of 24 items of the Science Learning Assessment Test, Cronbach Alpha (α) value is determined as .79. The necessary permission is obtained for use via e-mail from Yurt (2013) who has done the validity and reliability study of Turkish form.

Process

The schools determined by the researcher during the data collection period are visited perodically. The researcher devotes 20-25 minutes to each child. The questions that are left blank, unanswered or answered as "*I don't know*" are accepted as wrong as stated in instructions in the test. Science Learning Assessment Test applied to children and Parenting Styles and Dimensions Scale applied to their mothers are numbered during the application. After the forms are matched, a total of 440 scales that must be filled in by the mothers of the children are sent to the homes. A week later, the same schools are visited and the scales distributed are collected. The tests applied to the children of 45 mothers who does not want to fill the scales are considered as invalid and not used.

Data Analysis

The data obtained from the tests applied to the children attended to research are coded and uploaded to the computer. These data are analyzed with SPSS 21 statistical package program.

Correlation analysis is conducted to examine the relationship between parents' attitudes and science learning skills of preschool children. Hierar-

chical Multiple Regression Analysis is used to predict Parental attitudes of parents of preschool children and sociodemographic characteristics of the family's effect on children's science learning skills. Demographic variables (mother's age, monthly income of the family, mother's education level, mother's working status and number of children) are taken as the control variable and "*mother's working status*" variable is coded as dummy variable. Afterwards, general scores related to the variables determined as control variables and concepts are analyzed using enter method.

Before starting the regression analysis, it was examined whether the necessary assumptions are met. Skewness and kurtosis values of the data are checked for 0.05 significance level. In addition, the data set is examined in terms of multicollinearity hypothesis, correlation coefficients between independent variables are examined, VIF (Variance Inflation Factor) and Tolerance values are examined and it is observed that there are no multiple linearity problems between independent variables. After all these analyzes, the data set is found to be suitable for multiple regression analysis and the analysis is performed.

Results

In this section, the findings obtained as a result of statistical analysis of the data collected in accordance with the main and sub objectives of the research are presented and interpreted on the basis of the main and sub objectives.

Table 1. Correlation Values for Parenting Styles and Dimensions Scale and Science Learning Assessment Test

	Science Research Processes Sub Test	**Life Science Concepts Sub Test**	**Science Learning Assessment Total**
Authoritative	-,089	,038	-,019
Authoritarian	,090	-,063	,001
Permissive	,062	-,067	-,017

*p<0.05**

As can be seen in Table 1, there is no statistically significant relationship between the mean scores of the Scientific Research Process Tests and the average of authoritative scores (p= 0.077> 0.05), between the average scores of the Life Science Concepts Sub-Test scores and the average scores of au-

thoritative (p= 0.449> 0.05) and between the total assessment of science learning and mean scores of authoritative (p= 0.708> 0.05) (p> 0.05).

According to the table, there is no statistically significant relationship between the mean scores of Scientific Research Process Tests and the average of Authoritarian points (p= 0.075> 0.05), between the mean scores of Life Science Concepts Sub-Test and average of Authoritarian points (p= 0.208> 0.05) and between Evaluation of Science Learning total and the mean scores of authoritarian (p= 0.990> 0.05) (p> 0.05).

When the table is examined, there is no statistically significant relationship between the average of the Scientific Research Process Test scores and the average of the permissive points (p = 0.218> 0.05), between the average scores of Life Science Concepts Sub-Test scores with the average of the permissive points (p= 0.181> 0.05) and between the average total score of science learning evaluation and the mean permissive scores (p= 0.738> 0.05) (p> 0.05).

Consequently, it is concluded that there is no statistically significant relationship between science learning skills of children attending preschool education institutions and mothers' attitudes towards their children.

Table 2. The Results of the Hierarchical Multiple Regression Analysis Regarding the Socio-Demographic Characteristics and Attitudes of Mothers to Predict Children's Science Learning Skills

	F	**P**	**R**	**R^2**	**ΔR^2**	**β**	**p**
Step 1	3,939	,002	,220	,048	,048		
Mother's Age						,008	,893
Monthly Income of Family						-,019	,758
Mother's Education Level						,107	,111
Mother's Working Status						,146	,018
Number of Children						,134	,033
Step 2	2,562	,010	,225	,051	,002		
Authoritative						-,049	,392
Authoritarian						,001	,987
Permissive						-,026	,652

When Table 2 is examined, as a result of hierarchical multiple linear regression analysis: In step 1, demographic variables (mother's age, family's monthly income, mother's education level, mother's working status and number of children) were taken as control variables. Among the control variables, the mother's working status (β= .146) and the number of children

(β= .134) significantly predicted the total score obtained from the Science Learning Assessment Test as 4.8%. The variance of the total score obtained from the Science Learning Assessment Test is explained by this model (R^2 model = .048, p <0.5).

In step 2, the Authoritative, Authoritarian and Permissive points were added to the model. Authoritative (β= -. 049), Authoritarian (β= .001), Permissive (β= -. 026) do not significantly predict the total score averages obtained from the Science Learning Assessment Test. 5.1% of variance of the total score means of evaluating science learning is explained by this model (R^2 model= .051, p <0.5).

Table 3. The Results of the Hierarchical Multiple Regression Analysis Regarding Socio-Demographic Characteristics and Attitudes of Mothers to Predict Children's Scientific Research Processes

	F	p	R	R^2	ΔR^2	β	p
Step 1	5,626	,000	,260	,068	,068		
Mother's Age						-,024	,685
Monthly Income of Family						-,063	,288
Mother's Education Level						,154	,021
Mother's Working Status						,130	,034
Number of Children						,237	,000
Step 2	4,049	,000	,279	,078	,010		
Authoritative						-,074	,194
Authoritarian						,029	,651
Permissive						,029	,610

As can be seen in Table 3, as a result of hierarchical multiple linear regression analysis: In step 1, demographic variables (maternal age, family monthly income, mother's education level, mother's working status and number of children) were taken as control variables. Among the control variables, mother's working status (β= .130) and number of children (β= .237) significantly predicted the mean scores of the Scientific Research Processes Sub-Test. 6.8% of the variance of the Scientific Research Processes Sub-Test score is explained by this model (R^2 model= .068, p <0.5).

In step 2, the average scores of Authoritative, Authoritarian and Permissive were added to the model. Authoritative (β= -. 074), Authoritarian (β = .029), Permissive (β = .029) do not significantly predict the mean scores of the Scientific Research Processes Sub-Test. 7.8% of the variance of the mean

scores of Scientific Research Processes Sub-Test is explained by this model (R^2 model= .078, p <0.5).

Table 4. The Results of the Hierarchical Multiple Regression Analysis Regarding Socio-Demographic Characteristics and Attitudes of Mothers to Predict Children's Life Science Concept Skills

	F	P	R	R^2	ΔR^2
Step 1	1,640	,148	,144	,021	,021
Step 2	1,232	,279	,158	,025	,004

In the first step, demographic variables (maternal age, family monthly income, maternal education status, maternal employment status, and number of children) were taken as control variables in the hierarchical multiple regression analysis related to predicting the socio-demographic characteristics and attitudes of the mothers in predicting children's life science concept skills. In step 2, Competent, Authoritative / Authoritative and Permissive mean scores were added to the model. When Table 4 is examined, the Life Science Concepts Sub-Test dependent variable is not explained by the number of children, monthly income of the family, mother's working status, mother's age, mother's education status, permissive, authoritarian, authoritative independent variables and no significant model is formed (p> 0.05).

As a result, it is concluded that the sociodemographic characteristics and attitudes of the mothers of the children attending preschool education institutions explain the significant dimension of Scientific Research Process Sub-dimension and Evaluation of Science Learning Sub-dimension of the children's science learning skills and do not explain the Sub-dimension of Life Science Concepts statistically. . In the Sub-dimension of Life Science Concepts, it is seen that there is not a model explaining the dependent variable in a significant way.

Discussion and Conclusion

One of the aims of this study is to examine the relationship between parents' attitudes and science learning skills applied by their parents of 60-72 months preschool children. Another one; the answer is sought to the question of "*Do the socio-demographic characteristics and parents' attitudes of the mothers of 60-72 months of preschool children express their science learning skills significantly?"*. In

this section, the findings obtained from the study are discussed and the results are given.

When the relationship between science learning skills of 60-72 months old children attending preschool education and parental attitudes of mothers to their children are examined, it is concluded that there was no statistically significant relationship. While similar studies are possible to reach similar conclusions, it is seen that there are studies that conclude that science, mathematics, critical and creative thinking skills and family attitudes are effective in other social areas.

Korkmazlar (1980), in his study, examine the relationship between cognitive thinking styles of preschool children aged 5-6 years and the parenting attitude of the family. The result of the study partially supports the relationship between cognitive thinking styles of children and child rearing styles of the family. In addition, families from different educational and occupational levels play an important role. Dinçer (1993), in a study examining the relationship between parental attitudes and the creativity of the child, concludes that the restrictive behaviors of the parents prevent the independence of the child and thus the child is less creative. In addition, it suggests that further studies that would look at the relationship between parental attitudes and creativity level should be carried out on a larger scale so that the development of creativity should be determined with the existing studies and individuals' interest should be intensified.

Durmuş (2006) examined the personality traits and parental attitudes of parents with children aged 3-6 years. Data are collected with "*Adjective Check List*" and "*Family Life and Child Raising Attitude Scale*". As a result, it is found that as the education level increased, parents exhibited less "*overprotective*" and "*repressive*" attitudes, independent individual characteristics such as creativity and ideal self are inhibited when excessive protection and oppression are applied, and the parental attitude recognizing democratic equality developed sharing and cooperative characteristics they have.

Bayraktar (2009) states in his study titled "*Environmental/Cultural Accents in Cognitive Development*" that as a result of his researches, cognitive development is initially determined as biological but increases the effect of cultural/contextual factors over time. In the study, cultural/contextual factors are discussed as parent-child relations, teachers' teaching methods, culture and language and Vygotsky and Gal'perin's theories and thoughts on edu-

cation-teaching methods which emphasize the importance of environmental factors in cognitive development are examined. According to the literature surveys, it is stated that cognitive and behavioral development is ensured through intergenerational and interpersonal interactions in life process, and an important element of culture-status interaction in individual development is culture-specific language and it affects the individual's cognitive development through social interactions. It also states that there is ongoing debate about what influences or shapes cognitive development and studies emphasizing the role of environment/culture in cognitive development should continue.

Kurşunlu (2014) in his research, examines pre-school education program in Turkey in terms of support thinking skills, according to the findings, teachers state that students have high-level thinking skills, but environmental factors are quite decisive on these skills. When the achievement level is examined; cognitive and language domains were higher and social emotional domain gains were lower than other domains. Teachers believe that false family attitudes, physical inadequacies, and excessive class size are the obstacles.

As a result of the hierarchical multiple linear regression analysis related to the prediction of 60-72-month-old children who attend preschool education and their parents' socio-demographic characteristics and parental attitudes to predict children's science-learning skills, the result reached is that the mother's work and number of children significantly explain the total score averages. 4.8% of the total score of the assessment of science learning is explained by this model. It does not significantly predict the total score averages of learning science assessment of authoritative, authoritarian and permissive. It was determined that 5.1% of the total variance average of the evaluation of science learning was explained by this model.

As a result of the hierarchical multiple linear regression analysis regarding the socio-demographic characteristics and parental attitudes of the mothers of 60-72 months old children attending pre-school education institution and predicting the scientific research processes sub-dimension points: It was determined that the research process sub-test significantly predicted the mean scores. 6.8% of the variance of the scientific research process subtest score is explained by this model. It is observed that authoritative, authoritarian, permissive scientific research processes subtest do not signifi-

cantly predict the mean scores. 7.8% of the variance of the scientific research process subtest score is explained by this model.

When the hierarchical multiple regression analyzes of predication of socio-demographic characteristics of mothers of 60-72 months old children attending pre-school education institutions and their parental attitudes the sub-dimension of life science concepts from the science learning skills of children is examined; the sub-dimension of life science concepts is not explained by monthly income, mother's working status, mother's age, mother's education status, authoritative, authoritarian and permissive independent variables and no significant model is found.

Research on the subject shows that children of working mothers who participate in family support programs and develop themselves have an understanding and interest in science-related concepts. Irkörücü (2006) examines the effect of the mathematical support program and family participation applied to mothers on the mathematical concept skills of 6-year-old children. Within the scope of the research, "*Control Checklist of Mathematical Concept Skills*" is applied to measure the mathematical concept skills of children. As a result of the study, it is concluded that the parent-centered mathematical support program has a positive effect on the process of learning mathematical concept skills of children.

Crowley and Callanan (2001), in their research titled "*Scientific Thinking in Daily Family-Children's Activities*" observe the communication of children with their parents in a museum and observed how the scientific thinking styles of parents and children developed in daily life. The research data are collected and recorded by the children and their families at the museum. As a result of the study, it is found out that the families support their children to access the information themselves and try to provide more guidance in this context. It is concluded that parents sometimes play an explanatory role and lead children to access information, and that supportive and guiding interventions of parents affect children's knowledge and skills positively.

Uzun (2013) aims to examine the effect of family participation-oriented mathematical support program on the mathematical concept skills of 6-year-old children attending kindergarten and the development of children's education as a result of the participation of families in education. Forty children aged 60-72 months and their mothers are studied, and "*Mathematical Conceptual Skills Test*" is used to measure the conceptual skills of children.

According to the findings of the study, the mathematical concept skills of the experimental group children participated in the "*Family Participation Oriented Mathematical Support Program*" increases significantly compared to the children who does not participate.

In their research, Pan, Gauvain, Liu, and Cheng (2006) aim to compare American and Chinese mothers' learning the numbers in their daily lives of five and seven-year-old children and the contribution of mother-child interaction to children's proportional reasoning abilities. As a result of the study, it is found that Chinese mothers taught their children more mathematical calculations in their daily lives than American mothers. They observe that Chinese children's mothers' interaction with their children has a positive effect on their reasoning skills with numbers. On the other hand, they do not observe a significant change in the ability of American children to reason with numbers.

Jones, Taylor, and Forrester (2011), in their research, investigate the relationship between being a scientist and the factors that are affected in early childhood, find that it is important to observe their teachers and family members during childhood and to consider their suggestions.

Proposals

Proposals for Parents and Educators

In preschool institutions, during the hours when children are educated, presentations to parents to improve parental attitudes should be made by related persons, selection of in-school hours to enable participation in these seminars, and the presence of special play rooms for 0-3 years old for mothers with small babies. It can be suggested that the people who are interested should be selected who have at least the educational motherhood certificate and that they should be offered employment for work.

It may be suggested to organize activities in which parents can participate with their children aged 0-3. In this context, planning of play times for 0-3 age group children in every neighborhood, bringing mothers 0-3 age group babies and children to these areas and ensuring that they can benefit from rich materials free of charge within 1-1.5 hours, both mothers exhibit positive attitude and children curiosity and discovery.

As a result of the research, there is no significant relationship between mother attitudes and children's science learning skills, and it is concluded that mother attitudes are affected by the socio-demographic characteristics of the family. In order to minimize the impact of socio-demographic characteristics on applied mother attitudes, the following can be done; during the planning and implementation of the mentioned children's playgrounds, it may be suggested to provide these services in cooperation with municipalities, family physicians, schools, universities, related departments, libraries and mosques and to provide these services once a week for 2 hours. It is thought that these contributions will positively affect parental attitudes, especially children coming from families with low socioeconomic status and will develop children's curiosity feelings and scientific skills by encountering rich materials early.

Proposals for Researchers

1. In this study, the effect of mothers' attitudes on children's science learning skills is investigated. In other researches, fathers' attitudes can be examined and added as well.
2. This study is applied to 60-72 months old children. With the different scales to be developed, a group of various aged children can be added to other studies.
3. This study focuses on parental attitudes. In the other researches, the attitudes of the teachers can be examined.
4. This research focuses on the circumstances of the family, the first environment of the child. Other studies can be examined by adding the effect in the immediate environment.
5. In this study, maternal attitudes are examined under democratic, authoritarian and permissive dimensions. In other studies, the effect of other parental attitudes (negligent, anxious, etc.) can be examined by adding.

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