# EFFECTS OF EDUCATION-ORIENTED AND MAINTENANCE-ORIENTED PRESCHOOLS ON THE COGNITIVE FUNCTIONING OF THE CHILD

by

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EFFECTS OF EDUCATION-ORIENTED AND MAINTENANCE-ORIENTED PRESCHOOLS ON THE COGNITIVE FUNCTIONING OF THE CHILD

The present study investigated the hypotheses of differential effects of education-oriented and maintenance-oriented preschools on the cognitive functioning of preschool children.

Piaget's classification and seriation tasks were chosen as indicants of cognitive development. The general hypotheses was that children attending education-oriented preschools would develop more in cognitive functioning than those children attending maintenance-oriented preschools. Operationally it was hypothesized that children attending education-oriented preschool centers would perform in developmentally more advanced level in cognitive functioning measured by Piaget's task of classification behavior than children attending maintenance-oriented preschool centers. The second operational hypothesis was that children attending education-oriented preschool centers would perform in developmentally more advanced level in cognitive functioning measured by Piaget's task of seriation behavior than children attending maintenance-oriented preschool centers.

There were 72 subjects who were between the ages of five years and six years six months. Half of the subjects were from education-oriented preschools and the other half were from maintenance-oriented preschool centers. The materials used to test the above hypotheses were taken from Piaget's original work. They consisted of different sizes and colors, of wooden geometric blocks, wooden sticks and paper dolls.

The children were asked to perform tasks of classification and seriation in a separate room individually by the researcher. The performance of each child on each task was evaluated and assigned to one of the three developmental cognitive level of Piaget. Stage one signifies least

advanced stage three signifies the most advanced level of cognitive functioning. The data was further analyzed by the Mann-Whitney- U method.

The results of the present study support the pedicted level of performance among the education-oriented preschool attenders on the classification tasks. Specifically it was observed that the education-oriented preschool attenders attained scores at a more advanced cognive level than the maintenance-oriented preschool attenders on the classification tasks. For the seriation tasks there was a difference in favour of the education-oriented preschool children but it was not profound. The present study strongly suggests the need for longitudinal research in this area.

# EĞİTİM VEREN VE BAKIMA YÖNELİK YUVALARIN OKULÖNCESİ ÇOCUĞUN BİLİŞSEL GELİŞİMENE ETKİLERİ

Bu çalışmada, eğitim veren yuvalarla bakıma yönelik yuvaların okul öncesi çocukların bilişsel gelişimleri üzerindeki değişik etkileri araştırıldı.

Bilişsel gelişimin göstergeleri olarak sınıflandırma ve sıralama işlemleri seçildi. Genel beklenti eğitim veren yuvalara devam eden çocukların bilişsel gelişimlerinin bakıma yönelik yuvalara devam edenlere kıyasla daha ileri düzeyde olacağı yönündeydi. İlk denence eğitim veren yuvalara devam eden çocukların, Piaget'nin sınıflandırma işleminde, bakıma yönelik yuvalara devam edenlere kıyasla daha yüksek bilişsel gelişim gösterecekleri doğrultusundaydı. İkinci denence de sıralama işleminde, eğitim veren yuvalara devam eden çocukların bakıma yönelik yuvalara devam edenlere kıyasla daha yüksek bilişsel gelişim gösterecekleri doğrultusundaydı.

Çalışmaya yaşları beş ile altı yaş altı ay arasında değişen 72 denek katıldı. Bu deneklerin yarısı eğitim veren yuvalardan diğer yarısı bakıma yönelik yuvalardan seçildi. Yukardaki denenceleri sınamak için Piaget'nin orjinal çalışmasından alınan materyaller kullanıldı. Materyaller değişik renk ve büyüklükteki geometrik tahta bloklar, tahta sopalar ve karton bebeklerden oluşmaktaydı.

İşlemler çocuklara bireysel olarak ayrı bir odada araştırmacı tarafından verildi. Çocuklardan önce sınıflandırma sonra sıralama işlemlerini uygulamaları istendi. Her bir çocuğun, her bir işlem için gösterdiği başarı Piaget'nin üç bilişsel gelişim aşamasından uygun gelen birine yerleştirildi. Bu aşamalardan birincisi en düşük, üçüncüsü en ileri bilişsel gelişim düzeyini belirlemektedir. Veriler Mann-Whitney-U istatistiksel metodu kullanılarak analiz edildi.

Bu çalışmanın bulguları birinci denenceyi destekler nitelikte çıktı. Şöyle ki eğitim veren yuvalara devam eden çocukların sınıflandırma işleminde bakıma yönelik yuvalara devam edenlere kıyasla daha ileri bilişsel gelişim düzeyinde oldukları manidar bulundu. Sıralama işleminde de eğitim veren yuvalara devam eden çocukların lehine bir fark görülmüştür. Ancak bu fark sınıflandırma işlemindeki kadar belirgin değildir. Çalışma bulguları bu alanda boylamsal çalışmalara gerek olduğunu vurgulamaktadır.

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# I. INTRODUCTION

## A. Introduction to the Study

In order to respond to the demands of living in modern society and to have a better quality of life as an adult, the child's intellectual and social life must be enhanced. One way to facilitate this is by providing specific education to children and/or their families and teachers If interventions are provided at early ages, such as in preschool years, it needs less effort to reach the goal of better functioning of the individual and a more constructive, satisfied life.

A recent effort in this line is the "Comprehensive Preschool Education Project" carried out by the Psychology Department of Boğaziçi University. In this project, where mothers are also given training, the impact of various types of preschool experiences on the cognitive, social and personality development of the child is assessed. The project includes three context of child care environments. They are; 1) educational preschools, that is, preschools with an educational program and aim, 2) custodial preschools, that is, preschools which have as their main aim the physical care of the child; and 3) home care, that is, no preschool experience. Half of the mothers of children in each group receive instruction in their homes.

It is a longitudinal study that began in 1982 and will go on until 1986. The aim is to study "multidimensional development of the child" which is explained under four categories: 1) Development of the self, 2) cognitive development including language development, 3) physical development, and, 4) social-emotional development.

The design of the study is presented in Table 1. Three groups of children and their mothers constitute the sample population.

Table 1

The Design of the Comprehensive Preschool Education Project

| | Type of Care | | | | | |
|---|---|---|---|---|---|---|
| | Educational Comprehensive Preschool care | | Custodial Preschool Care | | Home Care | |
| Mother Training | 5 year olds | 3 year olds | 5 year olds | 3 year olds | 5 year olds | 3 year olds |
| No Mother Training | 5 year olds | 3 year olds | 5 year olds | 3 year olds | 5 year olds | 3 year olds |

This project includes a number of smaller studies. The present study was one such study. The aim was to investigate the differential effects of education-oriented and maintenance oriented preschools on the cognitive functioning of preschool children assesed by their performance on Piaget's classification and seriation tasks.

B. History of Preschool Education

Before discussing the specifics of this study some background information about preschool education will be given.

In Turkey preschool education models have been taken from the West. In this section the evalution of these models will be briefly presented.

Great educators such as Comenius, Pestalozzi, Froebel and Mantessoir sensed the importance of children's experiences before the primary school years. Early childhood education was affected broadly by their thoughts and ideas about education.

Comenius in the mid-seventeenth century (1592-1670) emphasized the importance of family on the development of the young child up to school age (Dowley, 1971). In the eighteenth century, Jean Jacques Rousseau (1712-1778) influenced educators with his ideas, eventhough his education system was not applied totally in schools. In his novel Emile he shows the aim of education to be the development of the natural endowment of

the child (Berktin, 1971). In the nineteenth century famous educators were Pestalozzi and Froebel. Pestalozzi (1746-1827) put emphasis on primary school education. He pointed out the importance of parents and the social environment on the development of the child. His education method broadly effected the whole world of education (Berktin, 1971), Froebel (1782-1852) was influenced by the ideas of Pestalozzi. Froebel emphasized the importance of sensory training for children and designed a series of play materials which are called "A Complete Series of Gifts for Play" (Bowen, 1910).

The "First Gift" consists of woolen balls of different colors.
The "Second Gift" consists of spheric, cubic and cylindrical objects.
The "Third Gift" is a wooden cube constructed from eight small cubes of equal size.
The "Fourth", "Fifth" and "Sixth Gifts" are cubes constructed with different shapes of different sizes.
The "Sevent Gift" is a card-board including different surface shapes such as squares, triangles etc.
The "Eight" and "Ninth Gifts" are introductory to drawing; consisting of sticks, letters, circular and semi-circular rings.

As it is seen these "Gifts" follow a certain sequence related to children's developmental levels.(Bowen, 1910).

Froebel opened a school for young children in Germany (1837) based on his notion of education. He is the first known educator putting emphasis on preschool education in "Kindergartens" (Berktin, 1971). Early in the twentieth century in Italy Maria Montessori (1869-1952) agreed with Froebel in allowing the child freedom to explore and teach himself. She replaced Froebel's materials with her own. The child in her system was left to pursue his own interest and was free to solve problems without interference. In this way she claimed to be able to develop and foster in the child a sense of competence. Her education method affected the other countries. Many schools were opened in Europe and United States that applied the Montessori Method (Berktin, 1971).

Considerable support for stressing cognitive learning in early childhood schooling is lent by the work of Jean Piaget. Pieaget sees the development of a child as taking place in sequential stages. Piaget, describes the early childhood years in terms of learning which takes place

during that period. The child evolves through stages of "knowing". His experiences and interactions with the environment act on the quality of this knowledge. When the experiences and the interactions with the environment are severely limited in number and variety, development of logical thought processes will be retarded (Goodlad, Klein and Novotney, 1973). Piaget's work provides a theoretical foundation for emphasizing cognitive development in the preschool years.

Some of Bloom's (1966) works pointed to the preschool years as a time of very rapid growth in intelligence and to the early environment in encouraging his development. He indicated the importance of children's early years for their cognitive growth for three reasons: (1) There is rapid growth in the early years thus early environment is very important because it shapes the characteristics of cognitive functioning during this period of most rapid formation. (2) Each characteristic is built on a base of that same characteristic at an earlier time. (3) It is much easier to learn something new than to learn something and replace it by a different set (Bloom, 1966).

Hunt (1971) argued that "intelligence is a network of central neural processes and information-processing strategies" and stresses the environment's effect on cognitive functioning. Hunt supported Bloom's idea about the necessity of early intervention before the age of four to provide the appropriate conditions for full cognitive growth (Evans, 1975).

Montessori believes that the child, given the opportunity, will select activity which is right for him in terms of his development and maturity and will stay at it as long as is necessary to master the principles involved. Children enjoy repetition and actually maintain a much longer attention span than adults do if they are engaged in something which interest them (Goodlad, et al., 1973).

The Montessori method of instruction has similarities with Piaget's formulation of cognitive development. The child in choosing his own activity presumably will select one which will provide the appropriate degree of dissonance at that particular time. The activities, however, are intended to be undertaken in a predetermined sequence, since each builds upon or expands a skill learned in a preceeding one (Evans, 1975).

The ideas and practices of these educators affected the movement of early childhood education in Europe and especially in the United States. Because of its impact on the practices of preschool education, the post-war developments in the United States will also be briefly reviewed here. During World War II, as a result of the increase in the number of working mothers in the U.S.A., nursery school classes and child care centers located near war-related industries were made available to many children (Goodlad, et al., 1973).

After World War II a lot of people moved out to the more attractive suburban areas. They were replaced in the cities by poor whites, this created the need for day-care centers and nursery schools for their disadvantaged children. The main objective of the kindergarten was to protect children's physical health and to provide jobs for teachers, nurses and other helpers (Dowley, 1971 and Goodlad et al., 1973).

During the period in the 1960's, due to the civil rights movement attention was paid to the underprivileged areas thus their children's success in school became an issue. At the same time the growing knowledge about the impact of early experiences on cognitive growth led early childhood education's emphasis to be put on the development of cognitive functioning.

According to the U.S. Department of Labor Reports (Goodlad, et al., 1973) 40 percent of the married women in the United States were members of the labor force during 1970, and of these some 10.200.000 had children. Very often a mother works because she must. Some middle-class mothers do not need to work in order to live. In that case they need to work for other reasons, such as to bring home some extra income or because they have a profession and they want to use it. About one fourth of all mothers with children under three years of age hold jobs. About one third of those have children between the ages of three to five. These children are either left with relatives, baby-sitters, or attend private nursery schools and some are looked after in groups by women at their home. The current status of preschool education in United States presents a picture of variations both in style and programs. There are both commercial and non-profit nursery schools in the U.S.A. accomodating different age groups and offerring either half-day or full day programs

that convene two or three days a week or utilizing the full five days week as stated by Evans (1975).

Currently the general aim in all kindergartens is the development of social, cognitive, sensory-motor and aesthetic skills. Yet programs in their application emphasize different points. Evans (1975) states that the way each program utilizes varying combination of techniques and materials of education makes it very difficult to identify clearcut programs. He proposes that curriculum patterns can be broadly said to emphasize either; a) the social skills of the child, b) individual development thus individualized education and c) teaching content. Uzunkavak (1983), unlike Evan's contention that it is hard to classify, has recently categorized the preschool programs into two: 1) The Traditional Nursery School and 2) The Cognitively Oriented Preschool.

The traditional program is said to be focused on socio-emotional, personal, perceptual-motor and general language development in an informal way. The assumption underlying this approach is that children who are socially and psychologically apt and mature will be ready for academic education (Rappaport, 1977; Uzunkavak, 1983).

The cognitively-oriented preschools focus on establishing and improving skills related to academic content. These programs vary according to what is regarded as preparatory material for formal schooling by people of different organizations (Rappaport, 1977; Uzunkavak, 1983).

Within each category several specific programs are also identified. Among the Piagetian programs one that is proposed by Lavatelli for the ages of four to seven is worth presenting here, since this program happens to teach the specific tasks that this author chose to investigate in the present study. The general objectives of this curriculum consist of three components. They are to develop in children (1) the ability to classify, (2) the conservation concept and (3) the ability to establish relationships between objects.

Classification ability is enhanced by providing the children concepts for discriminations. Children get the idea of "all" and "some". Gradually they possess the abstract ideas of "intention" and "extention". To develop the conservation concept, focus is put on the use of numbers, measurement and space operations. To establish the relationship between

objects, children are trained in the performance of seriation operations (Evans, 1975).

Language training is a very crucial part of this model and covers the above three components. The activities that are structured around there components are applied with the consideration of enhancement of the language skills (Evans, 1975).

## C. History and Current Status of Preschool Education in Turkey

During the Ottoman Empire the first preschools which were called "Sıbyan Mektepleri" were opened at the time of Fatih Sultan Mehmet. In 1915 the first regulations governing preschools were published. According to these regulations preschools could be opened or part of primary schools or independently (Kantarcıoğlu, 1974).

When the Turkish Republic was established in 1923, there were 80 nursery schools in 38 cities. They included 58880 children. After the acceptance of the Latin alphabet in 1928 the emphasis given to reducing the rate of illiteracy changed the governmental interest from preschool education to adult education (Unesco Report, 1977).

Tehcnological changes and economic conditions caused migration from rural to urban settings. As a result of such migration the family structure changed from extended to nuclear. The financial needs of the nuclear family increased in the urban setting forcing the mothers out of their home into the job market. Mothers could not find relatives to care for their children because of the loss of extended family structure. The need for institutions to assist mothers in caring and educating their children came to fore.

In Turkey preschool education consists of two structures (Unesco Report, 1977): Day care centers and Nursery schools. (1) Day care centers cover children between the ages of 0-6 years. These centers are supervized by the Ministry of Health and Social Welfare. (2) Nursery schools cover children between the ages of 3-6 years. These schools are supervised by the Ministry of National Education Youth and Sports.

All preschool centers can be separated into two categories on the basis of funding and support system, as governmental (public) and (private)

non-governmental. Non-governmental centers are privately run and governmental centers receive their financial resources directly or indirectly from the government.

We can also classify these centers as presented in Table 2 terms of utilization and quality of their facilities.

Table 2

Type and Number of Preschool Educational/Care Centers and Number of Children Attending such Centers(x)

| Ministry of Education | Number of Attending Children | % | Number of Existing Institutions |
|---|---|---|---|
| Kindergartens/nursery schools | 1.176 | 2.5 | 19 |
| Preschool classes in primary schools | 17.848 | 38.7 | 676 |
| "Application" Preschools | 5.782 | 12,4 | 275 |
| Ministry of Health and Welfare | | | |
| Boarding child care institution | 2.938 | 6.8 | 21 |
| Day care (veche) institution | 1.529 | 3.2 | 22 |
| Other Public | | | |
| University Preschools | 175 | 0.3 | 5 |
| Public enterprises preschools | 458 | 0,9 | 5 |
| Associations and Foundations | | | |
| Union for Child Walfare | 991 | 2,1 | 14 |
| Other charitable services | 1.439 | 3 | 11 |
| Private nursery schools | 9.062 | 19,4 | 158 |
| Factory/work child care services | 3.758 | 8 | 51 |
| Foreign preschools | 80 | 0,1 | 4 |
| Minority preschools | 1.358 | 2.9 | 30 |
| TOTAL | 46.707 | 99.8 | 1.599 |

x Source Kağıtçıbaşı, Çiğdem, Early Childhood Education And Pre-School Intervention: Experiences of Early Childhood Development and Education Project of Turkey. August 1981 Unesco, Paris.

As it is seen from Table 2 approximately 50,000 (46.707) children attend the 1.599 institutions in Turkey (Comprehensive Preschool Education Project, 1982; Öney, 1980).

It is also possible to classify preschool centers according to their orientation as maintenance-oriented or education-oriented. In the maintenance-oriented preschools children are cared for in terms of their physical needs by minimum number of caretakers, while in the education-oriented preschools they are provided with an enriched environment for purposes of full development and improved functioning.

In Turkey statistics show that there are 8.000.000 children between the ages of 0 to 6. From this population who are potential users of preschool education and day-care services of public or private institutions, the actual users correspond to only .6 percent of the children within this age range (Öney, 1980), due to the limited number of these facilities.

There are no statistical data and formal information about the quality of the existing centers. High quality refers to rich environment and opportunity to learn different concepts, to have different experiences which serve as basis for later learning. Informal observations and knowledge show that except for a few centers the general tendency is custodial care for children. During the process of the selection of centers for Comprehensive Preschool Education Project, same facts were observed. It is reported that it was difficult to find education-oriented centers serving working class population for the study. The shortage of education-oriented preschools forces one to do something to bring about the establishment of such services in Turkey.

The works of great educators such as Froebel, Montessori and Piaget provide theoretical background for stressing cognitive development in the early childhood period. According to Piaget, experience and interaction with the environment provide positive gains for cognitive development. Bloom points to the importance of early years and environmental factors as shaping powers on cognitive functioning. Shapiro and Biber (p.61, 1972) states that "the cognitive functioning - acquiring and ordering information, judging, reasoning, problem solving, using a system of symbols - can not be separated from the growth of personal and interpersonal processes" (Rappaport, 1977).

Recognizing the importance of cognitive development during early childhood, led to the structuring of preschool programs based on such premises in the West after 1960's. To promote such models in Turkey one of the things that can be done is to study and show the differential effects of education-oriented and maintenance-oriented preschool programs on the cognitive functioning of children.

Piaget's theory of cognitive development is taken as the conceptual framework for the dimensions utilized in this study. Piaget's conceptualization stressed the importance of cognitive development as well as the effect of environment on the unfolding of such capacities.

## D. A Summary of Piaget's Developmental Theory

Piaget conceptulazies cognitive development as a continuum of different stages beginning from birth. For development and maturation, continual interaction of the individual and the environment are essential. Development is described by series of phases and subphases. With increasing experience and interaction the individual completes are phase and reaches an equilibrium. While reaching an equilibrium for one phase the child begins with an imbalance for a new phase Maier (1965, p. 92) summarized this development as follows:

"1. There is an absolute continuity of all developmental process.
2. Development proceeds through a continuous process of generalizations and differentiation.
3. This continuity is achieved by a continuous unfolding each level of development finds its roots in a previous phase and continues into the following one.
4. Each phase entails a repetition of processes of the previous level in a different form of organization (schema). Previous behavior patterns are sensed as inferior and become part of the new superior level.
5. The differences in organizational pattern create a hierarchy of experience and actions.
6. Individuals achieve different levels within the hierarchy, although "...there is in the brain of each individual the possibility for all these developments but they are not all realized."[1]

[1] Maier, H.W., "The Cognitive Theory of Jean Piaget" Three Theories of Child Development, A Harper International Edition, N.Y., 1965 p. 92.

Piaget's phases include the sensori-motor phase, the preconceptual phase, the phase of intuitive thought, the phase of concrete operations and the phase of formal operations.

1. The Sensori-Motor Phase (roughly, ages 0-2): This phase depends on sensori and bodily-motor experiences. The child's movements and interactions with the environment and people are directed to gain physical gratification.
2. The Preconceptual Phase (ages 2-4): This phase is a transition period between self-satisfying behavior and rudimentary socialized behavior. During this phase, child's interest and awereness is placed upon objects and actions in his environment. Symbolic play and repetition of actual events results in contact with the objects of everyday life for the growing child. Language leads to communication with an outside world, and serves development. In this phase child orders his concept of space and spatial relationships by his subjective experiences. Two characteristics of this pahese are that:
- Events are reasoned and judged by their outside appearence.
- A child does not perceive both the qualitative and the quantitative aspects or any connective relationship between them. Thus the child can not sort objects using only one criterion. He can not manage to seriate the objects based on logic of relations.
3. The Phase of Intuitive Thought (ages 4-7): According to Piaget this phase is an extention of the preconceptual thought. In this stage the child's organization of his expanding knowledge helps him/her to gain the capacity to generalize his/her mental experiences. At this point, the child is incapable of thinking in terms of the whole, he is preoccupied with the parts.

The capacity to do a correct abstraction based on similar characteristics is not developed yet at this stage. For example when two sets of buttons of the same amount are arranged in a way that buttons in one set are put close together and the others are organized far apart from each other, the child indicates that the set covering a larger area is more in number. The perceptual frame dictates the comprehension of the environment for the child.

The Phases of Operational Thought

In this phase the child manages to see an event from different perspectives. This helps him to be aware of the reversibility which is

the capacity of relating events or thoughts to a total system of interrelated parts. This is called by Piaget "operational thought". It refers to the mental capacity to order and relate experience to an organized whole. Piaget separated operational thought into two distinct phases. These are the (a) Concrete operational thought and (b) Formal operational thought phases.

4. The phase of concrete operations (ages 7-11): In concrete operational phase mental experimentation depends upon perception. In this phase the child is able to establish the systems of classification. He can classify objects as part of a larger total system. He is aware of each object having several characteristics, and that objects can be classified according to similar characteristics, and that objects can be classified according to similar characteristics based on a criterion.

5. The Phase of Formal Operations (age 11-15): This is the last phase of intellectual development, childhood ends maturationally, and youth begins. A child enters into the world of ideas and the real world in this age. Random cognitive behavior is replaced by a systematic approach to problems. Around the ages of 14, 15 he develops thinking patterns. In this phase the individuals basic pattern of thinking and reasoning is established and the individual has reached intellectual maturity.

Within this conceptual framework of Piaget a preschool child is in the intuitive (concrete) operations stage of development. During this stage the ability to discriminate between objects develops and the child begins to classify them according to their similar characteristics. Piaget also claims that the beginnings of the ability to seriate objects are observed at this time.

In developing these abilities if environment is important, as claimed by Piaget's theory, planned experiences of preschool children should facilitate this cognitive growth. According to Piaget learning requires doing or experiencing with the environment; and perception is the starting point. Perceptual and moter development is the basis for later cognitive development, thougt, intellectual development and language (Inhelder and Piaget, 1964).

12-20

Kağıtçıbaşı (1979) proposed that prenatal and postnatal physical health and nutrition as well as heredity effect the cognitive capacity to a large extent which can stay as a hidden potential. The unfolding and improvement of this capacity depends on the environmental factors. Insufficiency of necessary environmental conditions have limiting effects especially in early childhood. Lack of stimulus and attention cause important retardations in the cognitive functioning. Compensation for them at a later time is not possible (Kağıtçıbaşı, 1979 a). Based on this assumption of the importance of environment the present study will deal with the relationship between the nature of experiences of preschool children and their cognitive performance on tasks such as classification and seriation of objects. As a background for this study, however, a brief review of earlier work done on the effects of environment on cognitive functioning and the studies on the concepts of classification and seriation will be presented here.

## E. Review of Literature

### 1. Studies on the Effect of Environment on the Cognitive Functioning of Preschool Children :

In this section the studies that are presented are on the effects of environmental deprivation on the cognitive level and overall functioning of the child. Intervention programs attempting to remediate the unfavourable environmental effects by modifying either the school environment or the home environment and some studies trying to change both settings are also reviewed. Then studies about classification and seriation are discussed.

Intellectual functioning has a developmental characteristic and specific functions, concepts, skills, etc. develop and are learned best at certain age levels. Education and environmental conditions at early stages of growth have profound concequences. Bloom (1966) has summarized a variety of longitudinal studies, some of which are presented here. Newman, Freeman, Holzinger (1937); Burt (1958) and Husen (1959) (stated in Bloom, 1966) studied identical twins and siblings reared apart and reared together to see the effects of environment and heredity on development of general intelligence. Results showed that the children reared in similar environments have similar level of general intelligence while children coming

from similar heredity (twins) raised in different environments resulted with different levels of general intelligence (Bloom, 1966).

It was observed that advantageous educational environments made a major positive impact on the assesed intelligence of identical twins who were separated during the first three years of life. Social and physical advantages of the environments showed only a moderate relationship to IQ differences. Anastasi (1958) looked at separated identical twins. Some of them had very similar environments and some were raised in dissimilar environments. For separated twins coming from similar environments, the rank order correlation was found similar environments, the rank order correlation was found to be .91 for their IQ scores, while for the twins coming from dissimilar environments the rank order correlation was found to be only .24 for their IQ scores (Bloom, 1966).

Lee (1951) compared Negro children in various grades in school who were born in the South of the United States and moved to Philadelphia and black children born and raised in Philadelphia to see the effects of environment on intelligence. The children from the South are taken as coming from a limited environment. Since the South is economically more deprived as well as the prejudice againsts the black population minimizing the existing opportunities for the black children. The children who are born and raised in Philadelphia face an environment offering more opportunities and less prejudice. Results showed that with increasing age the effects of environment on intelligence decreased and the greatest changes were observed in the first few years of life (Bloom, 1966).

Bloom (1966) derives some conclusions based on his review of studies on the effect of environment on intelligence of children up to the age of 17. One conclusion is that deprivation in the first four years of life can have the most profound impact on the child's intelligence than exposition to limited environments during later years. More specifically it is stated that "about 50% of development" of intelligence "takes place between conception and age 4, about 30% between ages 4 and 8, and about 20% between ages 8 and 17"[2] (Bloom, 1966, p. 88). The other main conclusion is that extreme environments can cause a difference of about 20 IQ points. Based on researches extreme environments have been described to be those that are deprived or abundant for the facilitation or limitation of development of intelligence. In the following areas enriched environments are characterized

[2]Bloom, B.S., Stability and Change in Human Characteristics, J.Wiley, J.Wiley and Sons Inc., 1966, p. 88.

by a good amount of opportunity to learn verbal and language behavior as compared with deprived environments. Role models who are competent in usage of language encourage the language development of children. Enriched environments are also distinguished from deprived environments by the greater number of possible experiences with books, pictures, T.V. and libraries that help cultivate the ability to make distinctions and comparisons between objects or ideas. The ability to make distinctions and comparisons in logical reasoning and problem solving are also important components of intelligence. Greater problem solving ability and higher level of logical reasoning is found in parents with higher level of education and occupation. In enriched environments children have the opportunity to have such parents as models. Greater amount of interaction especially that which is democratic and warm between adults and children lead to increased development in children. This kind of interaction is another differentiating factor between enriched and deprived environments (Bloom, 1966).

To see the effects of environment on intelligence some studies are done on institutionalized children. Dennis (1956-1966) studied the founlings in Beirut, Lebanon who were kept in an institution until they were six years old. The mean IQs of boys and girls were approximately 50. After six years girls were transfered to another institution named Zouk; and their IQ assesment after ten years showed no difference. On the other hand, boys who were sent to another institution named Brumana had positive IQ changes. The average IQ came up to about 80. This great difference was linked to the difference that was observed in the two institutions and their programs. Brumana provided more enriched environment for the children than Zouk. In 1956 foundings were begun to be placed in adoptive homes by a change of policy in Lebanon. It was found that when children up to the age of two were placed in adoptive homes, their intellectual development was later seen to be normal. They were able to overcome the retardation that was usually seen in groups of children from the same or similar institutions. However when children from the same institutions were placed in adoptive homes at later ages the improvement of their IQ was not as great. Children who were given to adoptive homes at the age of six were found to be functioning at three year old level. These children were retested at the age of 15, and a three year retardation continued to exist. These findings support Bloom's conclusions about the early fixation of

intellectual capacities.

Genetical or traumatical mental retardation has been considered to be permanent but mental retardation due to environmental deprivation has often been thought to be remediable. Findings of Dennis suggest that long-continued environmental deprivation causes permanent deficiency in intellectual functioning as well (Dennis, 1973).

Dennis (Rappaport, 1977) did a comperative study showing the importance of interaction between child and adult in two different institutions in Iran. In one setting children were not given toys and the child-adult ratio was eight to one. In the other setting the child-adult ratio was three to one and learning and interaction opportunities were more available. Motor development and emotional behavior greatly improved among the latter group than the former more deprived children (Rappaport, 1977).

Those who looked at social class differences assuming more limited environments for lower classes gave the following results. Golden, Birns, Bridger and Moss (1971) state as finding of their study that social class differences in intellectual performance are seen clearly after the third year of life. This age corresponds to the time of rapid language growth. It is assumed that this difference may be due to limited language development of lower class children along the other factors such as as less stimulation in their environment, lack of interaction with different materials and people. Perceptual skills are learned by infants as a result of experience with the environment. If these experiences are not sufficient children do not develop expected perceptual, motor and cognitive abilities (Golden, Birns, Bridger and Moss, 1971).

Şemin's study which is done in Istanbul with 2.300 primary school children who failed in their classes, showed that most of the under achievers came from low socio-economic background, inadequate family and environmental conditions. Seventy three percent of the children who failed came from low socio-economic status. Ninety percent of the parents' education were less than high school and only three percent of parents had graduated from the university (Şemin, 1975).

The literature reviewed so far demonstrate the positive and negative effects of environment on general intelligence and/or cognitive development of children at the preschool level. In the following section studies

investigating the effects of environmental interventions will be reviewed.

To see the differential effect of enrichment and deprived environments on the cognitive functioning some studies were done with animals since it is easier to have control conditions. It is unethical to put people consciously in deprived environments while it can be done with animals. In Kresch, Rozenzweig and Bennet's study (1962) the rats in enriched and impoverished environments were compared. Animals deprived of foods showed more errors per problem than others. The enriched condition rats which had been exposed to complex environments for 30 days performed better on discrimination tasks than others which were kept in isolation for the same 30 day period. At the same time the brain of these rats were studied. The rats raised in an enriched physical environment developed greater cortical brain weight and had increased chemical activity of the central nervous system. Finally they found that the animals in impoverished settings can be helped to improve by later enrichment of their environment (Rappaport, 1977).

Skeels and Dye (Zax and Specter, 1974) had an accidental observation in an institution about IQ gains of two orphans, aged 13 and 16 months who were cared for largely by teenage female inmates. It was observed that the two children had great positive changes and they were retested. They were found to have gained 31 and 52 IQ points after entering the institution. Depending on this observation Skeels and Dye started a program with 13 feebleminded children aged between 7 to 36 months with an avarege IQ of 64.3. As a control group higher avarage IQ children were selected from among children in the orphanage. For the experimental group a special setting included enriched stimulation, and one-to-one relationship provided by older inmates of the same orphanage. These feebleminded teenage girls cared for the babies for 5.7 to 52.1 month period. It was observed that while the control group lost an average of 26 IQ points the experimental children gained an average of 27 IQ points during the same period. This finding is relevant as it demonstrates the importance of one-to-one relationship and enriched stimulation that have favourable effects on intelligence.

In 1963, Gray and Klaus (Zax and Specter, 1974) studied four year old deprived children to see the effects of an intervention program. An experimental group of children were trained in the preschool they were attending. They visited at home. The program aimed to increase achievement

in school-related activities and to overcome presumed deficits in the children with regard to perceptual and cognitive development. Home visitors thought the parents to work with their children on certain tasks in addition to the training provided in the preschool. At the end of the program the experimental group had come up to with a higher average mental age than the control group. After five years in 1968 the same children were re-assesed and the experimental group continued to hold its success on apptitude tests, language skills, readiness tests for academic work, and achievement tests. In 1970 when these children were in their fourth year in school, the effects of the intervention continued but were less apparent. The sibblings of the experimental children were also found to have higher IQs than the sibblings of control group. This can be said to be the positive side effect of the home visit during the intervention program.

In another study Kernes, Teska, Hodgins and Bodger (Rappaport, 1977) moved the focus on intervention from preschool to home environment totally. In this study the experimental group of disadventaged mothers were thought "how to use positive reinforcement and also participated in weekly meetings designed to foster a sense of dignity and worth." At the end of a 15 month teaching program all children were tested with the Stanford-Binet Intelligence Scale and the Illinois Test of Psycholinguistic Abilities. The scores of the experimental children were found to be significantly higher than their controls. These findings were also supported by data obtained in the Levenstein study where mothers were trained on verbal interaction with their children and found that the experimental children gained higher IQ scores and performed better in subtests based on vocabulary than the control group.

In another study Kames, Teska and Hodgings (Rappaport, 1977) investigated the relative effectiveness of different preschool programs such as a highly structured program, a Montessori program, a less structured traditinal program and an experimental program, on language development. The experimental program was the same as the traditinal program with its emphasis on personal, social, motor and general language development, implemented with the difference of added stress on language deficits of the children and increased adult-child interaction. In the experimental program the staff-child ratio was 1/5 while all other programs had a larger number of children per teacher. At the end of the study, all groups had improved IQ scores. However the experimental

children performed significantly better than the other children (Rappaport, 1977).

During the first half of this century there was a belief that "IQ is hereditary and not changeble." Based on this assumption schools did not attempt to change programs to meet the children's needs and did not try to find new methods to teach. Parents were discouraged from stimulating their children. They thought that if they do not learn, they can not learn anymore. Trying to teach something by different method is a waste of time. After 1960's this tendency left its place to the environmentalists ideas which stresses the impact of environment on learning, as opposed to heredity. In 1964 the Head Start Policy was announced (Rappaport, 1977). According to this program poor children coming from lower socio-economic status were entering school, less prepared than the middle-class children. Its belief was based on the premise that "intelligence is a function of early experience," and their programs focused on adjustment to formal school preparation and unstructured socialization. The program provided medical care and day care with educational activities for children of the low-income families. In 1970's the educational benefits of the Head Start Programs were discussed. Some centers were more succesfull than others, because each center was autonomous in terms of staff qualifications, aims and the techniques that were used. Major findings obtained from the Head Start Programs indicate that the programs applied were useful for some children in some ways. The Westinghouse/Ohio Study (1969) examined the effects of these programs and it included 104 randomly selected centers from among the 12.927 centers. Children in the first, second and third grades who had been in Head Start programs were compared with non Head-Start groups. Measuring instruments were of self-concept, achievement reading-readiness and behavior ratings. Results showed that carefully operated programs provided success early in the child's academic experiences After few years these possitive effects tended to disappear.

According to environmentalists lower-class children suffer from cognitive deficits as a function of their inadequate early experience. Their later year achievements are low despite the effective intervention of educators, because they continue to liye in deprived home conditions.

The present author deduced from literature that lower-class children do not, in general, learn the proper content and proper use of language which is necessary for school success in their natural environment

The results from some of these reviewed studies show the importance of language skills for cognitive development during preschool years (Levenstein 1970; Rappaport, 1977). To prevent educational failure among the disadvantaged children environmental factors must be controlled. According to Bloom, by reducing individual differences, student's rate of learning and achievement level will be similar at schools. In other words, if all the learners posses the necessary prerequisites for learning, than it should be possible for all of them to adequetely learn the assigned tasks in school (Bloom, 1976). Providing a remedy for Lacking and set of skills to children from deprived environments, whether in a school setting or at home, can improve their performance in subsequent years in education.

Ideally it seems that enriching the environment of the families, providing mother training and preparing preschool intervention programs as a whole can bring about success in helping the cognitive development of children in deprived conditions. Yet all this is not easily possible. The first step, therefore seems to start with interventions directed at the cognitive development at the preschool level. One way of identifying and developing cognitive skills at an early age is through Piaget's classification and seriation principles that have an important part in the theory.

There are several studies utilizing Piaget's classification or seriation concepts and tasks. Some will be reviewed here to provide guideline for the present study.

## 2. Studies on Classification

Stimulated by Piagetian theory describing cognitive behavior as it occurs throughout the course of intellectual development, a number of studies are reported whose purpose was to chart both qualitative and quantitative changes in various tasks of classification. The assumption in most studies on this problem is that classification proficiency increases with age.

Nixon's study (1974) supports this notion. In his study subjects were 5 and 8 year olds. Subjects were shown to operate most consistently on nongraphic collections, significantly more nongraphic collections were achieved at 8 years than at 5 years. In a second study subjects were 5 and 7 year olds. They indicated a significant quantitative change from

5 to 7. Annet's study (1957) provides support as well. In that study refinement in grouping progressed as a function of age. According to results, when the chronological age increases, the diversity of classification employed by younger children decreases.

Parker and Day (1971) found that the developmental changes in classificatory operativity as a function of age confirms the contentions of Inhelder and Piaget (1964) Kofsky (1966) and Lovell, Michel and Everett (1962). Combination of perceptual attributes was found at an earlier age, then combination of functional attributes was seen and the combination of abstract attributes appeared last. The same are children showed the same kinds of error (Modgil, 1974).

In Piaget's theory of equilibration, the continual interaction between the individual and the environment is stressed. Opportunities for such interaction are often missing in a deprived environment and may contribute to differences in the level of development. Overton, Warner and Dolinsky's study (1974) investigated the performance of lower class Negro children and middle-class white children on multiplicative classification. According to the results of the study there were no significant differences in the performance of the middle and lower class children, at the chronological age four to five, and six to seven in tasks involving multiplicative classification. However lower class children at the chronological ages of eight to nine perform at a much lower level of classification operativity compared to middle class children.

Another study done by Wei, Lavatelli and Jones (1971) compared socially disadvantaged and middle-class young children. Subjects were drawn among preschool attenders and second graders. The results showed that both preschool and second grade children of the culturally deprived groups progressed at a slower pace in classification skills than children in middle-class groups. The middle-class children's answer were clearer and more logical than the answers of culturally deprived children.

In Golden, Birns, Bridger and Moss study (1971) social-class differences in cognitive development appear to begin somewhere between 18 and 24 months of age the divergence in intellectual ability only becomes great enough in mean IQ scores by about 3 years of age. In a longitudinal follow-up study of black children from different social classes, there were no significant social-class differences at 18 or 24 months of age. When

the same children were retested at approximately 3 years of age there was a highly significant 23 points mean IQ difference between children from black welfare and middle-income families.

Depending on these data we can say social-class differences are not detected in the cognitive functioning of children up to the second year of life. Such difference is found after the children three years and older. During the third year of life, as children become increasingly capable of using language, the social-class, the intellectual, the verbal and the educational level of the parents begin to make some difference in terms of facilitating the child's cognitive development.

Ataman and Epir (1972) studied classification behavior in a Turkish sample with 120 children of 7, 10, 13 and 16 years old from three different socio-economic levels. According to the results of the study Turkish children were not different from children in the other studies (Annet, 1959 Bruner et al., 1966; Davey, 1968; Siegel, 1953). With increasing age, children were more capable in their classificatory behavior. For instance the seven year olds made smaller groups significantly more than the older children; and the 15 year olds made larger groups significantly more than the younger ones. These data demonstrate that the ability to abstract develops with age. This increasing ability with the increasing age is consistent with Piagets findings (Inhelder and Piaget, 1959).

The Ataman and the Epir (1972) study also showed that the low socio-economic status subjects formed fewer groups on the classification tasks than the middle and the high socio-economic status subjects. The middle socio-economic status subjects formed significantly fewer groups than the high socio-economic status subjects. The formation of fewer groups on the classification tasks show that the children are more limited in their ability to conceptualize different characteristics of objects and similarities based on these criteria.

3. Studies on Class-Inclusion

According to Piagetian theory, the understanding of the concept of class inclusion is an important aspect of logical reasoning abilities (Inhelder and Piaget, 1964). A typical class inclusion task involves the presentation of two or more subclasses (squeres, circles, triangles) which both belong to one superordinate class (geometric shapes). The child

who answers "boxes" is assumed to be able to understand class inclusion, that is the hierarchical relationships between superordinate and subordinate classes.

As reported in a study by Mc Cabe et al., (1982) three patterns of performance were observed for Three to Eidit year olds on a series of class-inclusion problems. Three and four year olds responded in an approximately haphazard pattern while 5 and 6 year olds tended to be consistently wrong. Performance of 7 and 8 year olds showed a shift toward consistently correct responding. The observed patterns were confirmed by fitting a formal model to data.

An environment which is designed to stimulate cognitive growth produces a significant difference in the intellectual functioning of the child. Siegel et al. (1974) conducted a study with 3 and 4 year old children. Half of the children received training in class-inclusion reasoning. The remainder served as a control group. The training group correctly answered more class inclusion questions than the control group. The training was very effective particularly for the 4 year olds.

Opper's (1974) cross-cultural study investigated whether or not linguistic mechanisms produce a significant difference in the acquisition of class inclusion by Thai and Swiss children. Findings indicate that Thai children did not acxuire this concept faster than Swiss children. The same type of responses and errors were found at the some levels of development in both Thai and Swiss groups.

4. Studies on Seriation

Serial ordering operations relate to the ability to generalize along a linear dimension or to arrange objects in series. According to Piaget there were three distinct stages of seriation behavior of development and children can reach the point of correct performance for seriation task after 7 years of age Piagets's works give (1950, 1964) evidence demonstrating that children below the age of 4 or 5 do not have the concept of seriation. Yet others tend to think differently. A study by O'Reilly and Steger (1970), investigated the child's ability to perform judgements in the presence of an "anchor" for children between the ages of five to eleven.

According to the findings, subjects over the age of five could seriate in the presence of an "anchor or frame of reference". Children aged five or below could not seriate or use the anchor as a point of reference. Piaget's (1968) contention that children of chronologic age nine cannot seriate weight was questioned by O'Reilly and Steger because their results demonstrated that children or all six and above could order the weights, and the ability to seriate stimuli along some stimulus dimension was cognitively linked to the ability to utilize some frame of reference. Siegel has gone even further then O'Reilly and Steger, and he has attempted to study the ability to seriate of children as young as three years. In his study he had two samples one with children from three to five years old and the second sample with children from four to nine years old. The tasks of seriation that were presented to these subjects included two, three or four stimuli in the series. It also involved minimum amount of verbal instructions, limiting the verbal requirements of the tasks. According to the results even children as young as three years could learn a seriation task limited to two, three or four stimuli when the verbal requirements during the presentation of the tasks were minimized. A non verbal mode of questioning might aid children in showing their conceptualization of seriation.

One hundred children were selected randomly from the kindergarten children in a midwestern suburban community in a study summarized by Evans (1975) . Half of them were randomly selected for experimental study and the other 50 served as control group. Measured intelligence, socio-economic status, sex and chronological age were the control variables. Piagetian activities were experienced for five months with the experimental group; then the two groups were compared, and the results showed that the children who had experience with Piagetian activities performed better than the control group children on Piaget's tasks (Evans, 1975). Another finding utilizing lower class kindergarten children as subjects is reported by Raph and Liebermann supporting the above findings.

A similar study to the present one with younger preschool children and small sample (total of 54 in three groups) was carried out by Öney (1980) The results are reported to favour the effects of education-oriented preschools on classification and seriation tasks over those children who had no preschool experience and those attending maintenance-oriented preschools.

## II. STATEMENT OF THE PROBLEM AND HYPOTHESES

Since environmental factors have determining effects on child development; it can be said that the quality of preschool training is of crucial importance. High quality level training means a high amoung of personal and social interaction among children, between personal and social interaction among children, between children and teachers, children and the environment, opportunity to learn different concepts and to have different experiences which serve as basis for later learning.

This study aimed to investigate the differential effects of education-oriented preschools signifying enriched environments and maintenance-oriented preschools, as an example of limited environment, on the cognitive functioning of the preschool children.

In order to compare these centers' effects on the development of cognitive functioning Piaget's classification and seriation tasks were chosen. The reason for choosing the see tasks as indicators of cognitive growth is that, these behaviors are accepted as important aspects of cognitive activity.

Explanation of Chosen Tasks: Classification and seriation. Classification involves the conceptualization of a collection of things. The child begins to classify a collection of objects about 2 to 4 years of age in a quite primitive way. Piaget offers a number of rules about the classes.

a. No object is a member of both classes simultaneously,
b. All members of a class share same similarity,
c. Each class may be described in terms of a list of its members,
d. The defining property of a class determines what objects are placed it.

According to Piaget grouping is an abstraction which describes basic processes like the ability to mentally combine two smaller classes into a larger one or to take away one class from another. Grouping involves the property of associativity and the property of composition (Ginsburg, 1979).

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The early preoperational child is not yet capable to differentiate and to coordinate the crucial properties of "class" intention and extention. While he is actualy working from a "similarities" base, he often includes objects that do not meet class criterion and he frequently changes the criterion. He might begin sorting by shape and suddenly switch to color. After that, he will add objects in such a manner as to make it look more like an objects such as a tree or train etc. on a completely random basis. And he may simply omit some objects from all of his collections. This is possible because the child's criteria change so rapidly that no sorting at all is discernable to the adult observers (John and Philips, 1975).

Class inclusion operations relate to the child's ability to manipulate part-whole relationships within a set of categories. Before the age of about seven, for example, children given a box containing about 18 brown and 2 white beads, all wooden, and asked whether there are more brown ones or wooden beads, reply that there are more brown ones because only 2 are white. That the categories are available and observations are correct is shown by the fact that the younger children when asked the questions separately give correct answers as to the relative proportions of brown, white and wooden beads. However, without class-inclusion operations they can not deal with the parts and the whole at the same time, and thus they make a false generalization (Inhelder and Piaget, 1958).

When the child achieves true classification, he is able to differentiate and coordinate the crucial properties of "class" intention and extention.

"Intention" is the criterion, the quality that defines the class. "Extention" is the sum of all the objects that meet that criterion (John and Philip, 1975).

When the child achieves true classification, intention and extention must be completely coordinated.

According to Piaget classification ability has three stages and he stresses that the age norms describing classification are only approximate (Ginsburg, 1979).

In Stage I: (2 to 5 years): The child fails to use a clear rule or defining property to sort the objects into different classes.

In Stage II: (5 to 7 years): The child sorts the objects by a reasonable defining property and even constructs a hierarchical classification, but fails to comprehend inclusion relations.

In Stage III: (7 to 11 years): The child has a mature notion of class, particularly when real objects are involved. The child sorts them by defining properties, understand the relations between class and sub-classes.

According to Piagetian theory, the understanding of the concept of class inclusion is an important aspect of the logical reasoning abilities (Inhelder and Piaget, 1964).

Seriation: Serial ordering operations relate to the ability to generalize along a linear dimension or to arrange objects (or their properties) in series. They are based on logic of relations rather than class logic: The signs are and greater than, and less than respectively. At about 7 years old when the child is given a set of sticks to arrange in order of size, he proceeds by taking the smallest first, then the smallest of those which are left and so on, rather than beginning in a random manner and rearranging when discrepancies are noticed (Inhelder and Piaget, 1958).

Piaget detached three distinct stages of seriation behavior of development:

In Stage I: (4 to 5 years old): The child fails to seriate the objects. S/He arranges them randomly.

In Stage II: (5 t6 6 years old): In this stage child seriate the objects by trial and error.

In Stage III: (7 years old and above): In this stage the ordering is guided by an overall plan (Ginsburg and Opper, 1979).

Based on previous research (Siegel, 1974) it is assumed that the children's level of performance on cognitive functioning, thus the classification and seriation tasks of Piaget can be improved and accelarated by training. For example in Siegel's (1974, 1978) study three year old children could deal with four stimulus tasks at a mature cognitive level in terms of seriation behavior.

Thus the present study proposed the general hypothesis that:

Children who are in an enriched environment and who receive specific education develop more in cognitive functioning than children who are in a limited environment and who do not have any systematic aid.

This general hypothesis may be operationally stated in two parts as:

Hypothesis 1: Children attending education-oriented preschool centers perform at a developmentally more advanced level in cognitive functioning measured by Piaget's task of classification behavior than children attending maintenance-oriented preschool centers.

Hypothesis 2: Children attending education-oriented preschool centers perform at a developmentally more advanced level in cognitive functioning measured by Piaget's task of seriation behavior than children attending maintenance-oriented preschool centers.

# III. METHOD

In this section initially the sampling process of the preschool centers from which the subjects were recruited is presented. Then the subject selection, material used in the study and the procedure is explained.

## A. Sample

1. Selection of the centers: The selection of sample was carried out by the investigators of the Comprehensive Preschool Education Project. Since the project aimed to cover the working class population, the working class preschool centers were chosen for the study. Working class status of the parents was determined by their socio-economic background and the location of the centers.

The chosen centers were further classified either as education-oriented or maintenance/custody oriented preschools. The nature of these centers was determined on the basis of an interview with the director of the center and a rating scale. The interview schedule consisted of questions regarding the daily noutine in the preschool activities, materials and facilities available (See Appendix A.). The original interview schedule was pretested by interviewing ten teachers in nursery schools which were not under consideration for inclusion in the sample, but which served approximately the same population, and was revised on the basis of this preliminary test. All interviews were conducted by the same interviewer.

The preschool centers were also observed for the purpose of corroborating the information from the interviews. The physical setting, routine and teacher's behaviors were observed and recorded on a rating scale (See Appendix B). Each teacher was rated by two observers for a total of five half days, alternating mornings and afternoons. The observers were trained to a satisfactory level of interrater reliability through observations at the Boğaziçi University Preschool Center (Comprehensive Preschool Education Project, 1982).

Once the centers were classified as either maintenance or education-oriented, the characteristics were given to describe them.

"Characteristics of the Maintenance-Oriented Preschools":

1. Emphasis is on maintenance activities such as physical care, feeding and cleaning.
2. Center provides an environment with a low level of stimulation. There are either few toys or they are inaccesible in cupbords.
3. Activities are mainly group oriented.
4. Children are expected to obey authority. They are expected to be engaged in activities which are considered to be appropriate by the teacher.
5. There is little interaction and cooperation between the school and the family regarding the children.
6. There is a high child-staff ratio (25/1, 30/1).

Characteristics of the Education-Oriented Preschools:

1. Emphasis is on educational activities such as teaching concepts, operating on numbers, and presenting several objects which are original for the children.
2. The center provides rich stimulating environment. There are sufficient materials and toys to play and experiment with.
3. Activities are designed to meet the individual needs of the children.
4. Children are expected to develop initiative in controlling their behavior.
5. Children may engage in activities which they themselves choose and work at their own rate.
6. There is cooperation and interaction between the school and family. The family is informed about the child's needs, problems, abilities, and development in general.
7. There is a low child-staff ratio (15/1, 20/1)"[3](Üney, 1980).

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[3]Üney, B., "Effects of Preschool Education on the Cognitive Functioning of the Child" Project, Boğaziçi Üniversitesi, 1980.

Six preschool centers were chosen for the study; three with educational aims, and three with a custodial/maintenance orientations. These centers are in widely separated locations in Istanbul. Two of the education-oriented institutions serve the children of workers in private sector factories and one is run by the Institute of Child Welfare and Protection (Çocuk Esirgeme Kurumu). All three maintenance-oriented centers serve the children of workers in different State Monopoly factories.

2. Selection of the subjects: Following the identification and selection of the education-oriented and maintenance-oriented preschool centers where working class children attend, the subjects of the study were selected. In this selection children from these centers were randomly chosen according to their age from a list provided by the director of the centers. The mother of each subject was visited and interviewed at home. Through these visits and interviews, observations an the location and the physical and living conditions of the home were made; and information about parent's education, occupation, etc. was gathered (See Appendix C.). The educational level of parents was between no education through ninth grade. All of the above processes were carried out by the investigators of the Comprehensive Preschool Education Project (CPEP), prior to the beginning of the present study.

This researcher took her subjects from among the 300 children selected for CPEP. The children on the CPEP subject list between the ages of 5 years 0 month and 6 years 6 months were selected. There were 40 children in the education-oriented preschools and 57 children in the maintenance oriented preschools. Children in the latter group were reduced in number to 40 by eliminating every fifth child on the list. Thus 80 children were included in the sample. Six subjects from the total sample were lost later because they dropped out of preschool during the period of the study. This left 36 subjects in the education-oriented and 38 in the maintenance-oriented groups. To make the number of subjects equal this total was then reduced to 72 by eliminating two of the maintenance oriented subjects randomly.

Table 3 presents the number of subjects from each center

Table 3

Distribution of Subjects According to Different Preschools

| Type of Orientation of Preschool Centers | Preschool centers | Number of children |
|---|---|---|
| Education | A | 18 |
| | B | 8 |
| | C | 10 |
| | Total | 36 |
| Maintenance | D | 16 |
| | E | 8 |
| | F | 12 |
| | Total | 36 |

Most of the mothers of the 72 children had a fifth grade education (49 mothers out of 72) (See Appendix D). Most of the fathers were workers and their level of education clustered around fifth grade as well.

The children included in the sample had been attending preschool at a minimum of three months and a maximum of two years. An average attendance of eighteen months of nursery school was recorded.

The mean age for the maintenance-oriented preschool group was 5 years 8 months and 5 years 7 months for the education-oriented preschool group (See Appendix E).

Materials: Materials were the same as Piaget's original materials. For the classification tasks, blocks were prepared from the book of Inhelder and Piaget, The Early Growth of Logic in the Child. For the seriation tasks, sticks and dolls were prepared from the book of Ginsburg and Opper, Piaget's Theory of Intellectual Development.

For the classification tasks, materials were wooden geometric blocks. Their shapes included cubes, circles and triangles. Their sizes and colors were different. Each shape consisted of large and small kinds with

different colors. The colors were red, blue, green and yellow.

For the seriation tasks materials were wooden, blue and red sticks and paper dolls of graduated sizes.

A detailed description of these materials are as follows:

Materials for Classification Task (See Appendix F)

| | |
|---|---|
| 4 large cubes | (4.0 cm.x4.0 cm.x4.0 cm.) 2 red, 2 blue |
| 4 small cubes | (3.0 cm.x3.0 cm.x3.0 cm.) 2 red, 2 blue |
| 4 large circles | (diameter: 4.0 cm., height: 1.5 cm.) 2 green, 2 red |
| 4 small circles | (diameter: 3.0 cm., height: 1.5 cm.) 2 green, 2 red |
| 4 large triangles | (4.0 cm.x4.0 cm.x4.0 cm., height: 1.5 cm.) 2 green 2 yellow |
| 4 small triangles | (3.0 cm.x3.0 cm.x3.0 cm., height: 1.5 cm.) 2 green, 2 blue |

Materials For Seriation Task

| | |
|---|---|
| 10 red sticks | tallest one is 16.3 cm<br>shortest one is 9.1 cm<br>between the two adjacent sticks there is<br>.8 cm. difference. |
| 10 blue sticks | tallest one is 15.9 cm<br>shortest one is 8.7 cm<br>between the two adjacent sticks there is<br>.8 cm. difference. |
| 10 paper dolls | tallest one is 18.5 cm.<br>shortest one is 9.5 cm<br>between the two adjacent dolls there is<br>1.0 cm. difference. |

B. Procedure

Prior to the main research a pilot study was carried out in cooperation with the Comprehensive Preschool Education Project.[X] This pilot study was done by two graduate students and two other members of the research

[X]Unpublished papers of Psychology Department of Boğaziçi University.

group. Each experimenter applied the classification and seriation tasks to ten children. Some of these children were attending the Boğaziçi University Preschool Center; others were children of friends and neighbors. The pilot study was carried out to see if (1) the materials were comprehended by the children, (2) the materials were suitable to what the experimenter wanted to study, and (3) the instructions were understood correctly by the children so as to make the necessary modifications. It also served the aim of providing practice for the experimenters before the actual study. The present researcher is one of these four experimenters.

By using the $\frac{\text{number of agreements}}{\text{number of agreements + disagreements}} \times 100$ formula,

interjudge reliability scores on the evaluations of the children's performance an classification and seriation tasks were computed and they are shown in Table 4.

Table 4

Interjudge reliability scores on the evaluation of children's performance on classification and seriation tasks (of fair experimenters of the pilot study)[X]

| | Experimenters | | | |
|---|---|---|---|---|
| Classification | 1 | 2 | 3 | 4 |
| Task 1 | .80 | .90 | .92 | .94 |
| Task 2 | .91 | .90 | .89 | .90 |
| Task 3 | .75 | .79 | .98 | .83 |
| Seriation | | | | |
| Task 1 | .72 | .73 | .75 | .75 |
| Task 2 | .73 | .75 | .76 | .76 |
| Task 3 | .72 | .70 | .74 | .75 |
| ..... Seriation | .75 | .75 | .76 | .77 |
| ..... Classification | .75 | .79 | .79 | .78 |

[X]Each trial includes ten children.

It is observed in the table that the interjudge reliability is satisfactory.

In the present study the experimenter herself applied the tasks with the children in the centers which the children were attending. She carried out the tasks with each child in a separate room. The experimenter and the child sat on the opposite sides of a table, facing each other. Average time for the completion of the tasks was half an hour.

Initially, all of the objects were presented to the child and s/he was free to play and manipulate them for two minutes. This was done so that the curiosity of the child would subside and s/he could work on the tasks with more concentration. Then all the materials were taken away, except for the geometric objects, and the child was required to work on the classification tasks. After that the child was asked to carry out the tasks with the sticks and the dolls for the seriation tasks.

Procedures for the Classification Tasks

TASK 1: Only the large and small cubes were left on the table and the experimenter gave the following instruction:

"Now, we will play a game with you. There are several objects (boxes, cubes) in front of you. Put together those that are alike".

(Şimdi seninle bir oyun oynayacağız. Önünde birçok kutular (küpler) var. Bunların birbirlerine benzeyenlerini bir araya koy).

TASK 2: All the cubes and circles were left on the table in a mixed way and the same instructions were repeated.

"Now, put together those that are alike".

(Şimdi bunların birbirlerine benzeyenlerini bir araya koy).

TASK 3: All of the objects (cubes, circles, triangles) were presented to the child in a mixed way and the same instructions were repeated by the experimenter.

"Now, put together those that are alike".

(Şimdi bunların birbirlerine benzeyenlerini bir araya koy).

If the child was able to classify objects for each task; class-inclusion questions including the concepts of "more", "all" and "any other" were asked.

The experimenter asked the questions according to basis the child utilizes for classification (color, shape or size).

If the child classified them according to color, questions were:

"More"

- Are there more boxes or red boxes?

(- Kutular mı çok, kırmızı kutular mı?)

"All"

- Are all the boxes red?

(- Bütün kutular kırmızı mı?)

"Any other"

- If I take all the red boxes, are any other boxes left?

(- Bütün kırmızı kutuları alırsam, başka kutu kalır mı?)

When the child uses either shape or size as basis for classification, then the same questions are asked by inserting the word "cube", "circle", "triangle", "big" or "small" in the place of the word "red" in the above examples.

The questions were repeated and/or asked in a slightly different form until the examiner was satisfied about the child's level of development of the concept of class inclusion. For example: If the child failed to understand the question, "Are there more boxes or red boxes?" it was repeated or asked in different forms such as, "Are there more boxes or are there more red boxes?"

Procedures for the Seriation Tasks

TASK 1: The materials for the first task were 4 dolls and 10 red sticks. First, 4 dolls were spread out on the table.

Experimenter gave the following instruction:

"Now, we gill play another game with you. Put the dolls in order from the smallest to the biggest one".

(Şimdi başka bir oyun oynayacağız. Bebekleri küçükten büyüğe doğru sıraya diz).

If the child could not do it, experimenter put them in the right order and showed the smallest one, biggest one and others.

This operation was not scored. After this operation the experimenter put the ten red sticks on the table in a mixed order and gave the following

instruction:

"Now, find the smallest stick and put the rest in order beginning from the smallest to the biggest".

(Şimdi, en küçük sopayı bul ve küçükten büyüğe doğru sırala).

If it was not done correctly, the experimenter showed now to put them in order by stressing that it is like steps in a staircase. No score was given to this performance. Then the sticks were shuttled again and the child was asked to do exactly like to experimenter. If the child could perform correctly in this trial, then Task 2 was given to him. If the child could not do it after this second trial, then Task 2 was skipped.

TASK 2: The materials for Task 2 were 10 red sticks and 10 blue sticks.

A second set of sticks (blue ones) were given to the child in a mixed order without removing the series of the red sticks which were put in correct order for Task 1 by the child. The experimenter gave the following instruction:

"Put these blue sticks in order, starting with the smallest and going to the biggest in between these red sticks without changing the order of the red sticks."

(Bu mavi sopaları, küçükten başlayıp, büyüğe doğru, kırmızıların sırasını bozmadan, aralarına yerleştir). The child is given Task 3 regardless of her/his performance on Task 2.

TASK 3: The materials for Task 3 consist of 10 paper dolls and 10 red sticks.

Initially the experimenter seriated the dolls in a line from the smallest to the biggest; and in a second line under the dolls, sticks were seriated from the smallest to the biggest. Sticks were near each other, and dolls were seriated close enough to hold each other by the hand.

The experimenter gave the following instruction:

"These dolls will go for a walk on the street. Each needs a suitable stick. Choose the suitable stick for each one correctly, and put it on the doll".

(Bu bebekler yürüyüşe çıkacaklar, hepsinin kendine uygun bir sopaya ihtiyacı var. Herbiri için uygun sopayı seç ve onu bebeğin üzerine koy".

The expected performance was one-to-one correspondence by taking note of the sizes. This procedure was not scored.

Next, the experimenter put the dolls and the sticks into two separate groups which were presented on the table in a mixed order, and they were spread out. The same above instructions were given.

C. Scoring and Evaluation

According to Piaget, there is an hierarchical process of maturation for gaining the ability for correct performance from stage I through stage III. Stage I signifies developmentally the most primitive mode of cognitive functioning. Stage III significe the mature level of functioning in relation to these behaviors. As presented in the preceding section, the tasks from 1 to 3 become successively more complicated. Each task in itself can be responded to by primitive or more cognitive reasoning. That is, every response to each task is assigned one of the three developmental stages. Then the performance of the child and scoring for all the tasks for one type of operation, eg. classification, can be studied to see what stage most of the responses of the child fall into.

1. Evaluation of Classification Tasks:

Children were assigned to one of three different stages on the basis of their responses to the different tasks performed. For task 1, 2 and 3, responses were scored and categorized under stages I, II and III according to the following criteria used by Piaget and his colloborators (Piaget and Inhelder, 1964; Ginsburg and Opper, 1979).

STAGE I: This stage represents the performance of children from two to five years of age, and is called the stage of graphic collections. Here the child unites objects in graphic collections. Three type of reactions are not true classes. In this stage, objects are put together without any guiding plan. The child can put the object together without detectable similarity.

Types of reactions are:

1. Small Partial Alignments: The child constructs a number of independent linear arrangements, while leaving some of the material untouched. Sometimes successive similarities exist between one object and the next. For example: one child can begin by putting cubes of various colors then put the blue circles near blue triangles. The blue color beging the criterion of successive similarity. Then the child may go an with totally unrelated yellow triangles an top of blue cubes.
2. Collective Objects: Consist of two or three dimensional graphic collections of similar elements which form a unified pattern of figure.
3. Complex Objects: Consist of collections composed of heterogenous elements having a geometrical or descriptive character. For example; the child may arrange the objects to make a train or tower.

Children responding in these above forms were assigned to stage I.

STAGE II: This stage represents typically the performance of children from 5 to 7 years of age. This stage has been called the stage of non-graphic collections, which characterize responses based on similarity alone. The products of this stage can not be classes since they are far from being based on logical operations. The following criteria were considered in assigning subjects to stage III.

1. All elements in the initial array have been classified.
2. Elements are divided into two or more collections each composed of elements of one kind and no others.
3. Some of the objects might be grouped according to a criterion but they are not clearly separated from the rest to the age of the observer. When the subject is probed through questioning s/he can give a proper conceptual response as to the criteria that s/he has used.
4. There is no class-inclusion.

Children responding in these above forms were assigned to stage II.

STAGE III: This stage represents typically the performance of children from 7 to 11 years of age. The typical responses exhibited during this stage include the first three criteria of stage II, and class-inclusion. If subjects could answer questions about class inclusion they were assigned to stage III.

2. Evaluation of seriation tasks

Subjects were assigned to one of three stage according to their responses to the seriation task. The following criteria were considered in assigning subjects to different stages.

STAGE I: This stage represents typically the performance of children from 4 to 5 years of age. The typical responses of this stage include:
1. No attempt at seriation,
2. Random arrangement of objects in an incorrect order,
3. Formation of subseries of two, three or four elements which are not united.

Subjects responding in the above forms were assigned to Stage I.

STAGE II: This stage represents typically the performance of children from 5 t5 6 years of age. Children in this stage should accomplish seriation emprically through trial and error thus subjects arranging objects in a correct order throug trial and error have been assigned to Stae II.

STAGE III: This stage represents typically the performance of children from 6-7 years old and above. Subjects doing systematic arrangement of elements with an operational method were assigned to stage III for seriation task. In this stage the ordering is guided by an overall plan (Ginsburg and Opper, 1979).

# IV. RESULTS

Distribution of the raw data and the statistical analysis utilizing the Man-Whitney-U in evaluating these data are presented in this section.

The presentation of raw data:

The subjects responses were analyzed and scored according to their performance on different tasks. Each child was assigned to one of the three developmental stages of Piaget in classification and seriation tasks.

Classification:

Table 5 presents the frequency distribution of the children from education-oriented preschool for classification tasks interms of their performance with regard to different developmental stages.

Table 5

Frequency Distribution of Children Attending Education-Oriented Preschools for Classification Tasks in Different Developmental Stages

| Number of Children (f) | Stages | | |
|---|---|---|---|
| | Classification Tasks | | |
| | Task 3 | Task 2 | Task 1 |
| 19 | 3 | 3 | 3 |
| 2 | 3 | 3 | 2 |
| 2 | 3 | 1 | 3 |
| 2 | 2 | 2 | 2 |
| 3 | 1 | 3 | 3 |
| 3 | 1 | 2 | 2 |
| 4 | 1 | 1 | 3 |
| 1 | 1 | 1 | 1 |
| T: 36 | | | |

Table 5 indicates that; in the education-oriented preschool centers for all the classification tasks more than half (19) of the subjects were able to respond at the most advanced developmental level, stage 3. Inspection of the table shows that for Task 1 28 children, for task 2 24 children, and for task 3 23 children were able to respond at the cognitive developmental level of stage III. According to Piaget the five to seven year old children would perform at stage III level of cognitive fnuctioning in relation to classification operations. While the group of children from the education-oriented preschools in the present study performed at a great rate at the most advanced cognitive level. Nineteen children had reached this stage totally. While thirty children can be said to be in transition from stage II level to the stage III level of functioning. Thus it can be said that the activities in the education oriented preschools have accelerated the development of cognitive functioning as assesed by classification tasks.

Table 6 presents the different stage performances for the three classification tasks in the maintenance-oriented preschools.

Table 6

Frequency Distribution of Children Attending Maintenance-Oriented Preschools for Classification Tasks in Different Developmental Stages

| Number of children (f) | Stages | | |
|---|---|---|---|
| | Classification Tasks | | |
| | Task 3 | Task 2 | Task 1 |
| 7 | 3 | 3 | 3 |
| 2 | 3 | 3 | 2 |
| 1 | 2 | 3 | 2 |
| 1 | 2 | 2 | 3 |
| 9 | 2 | 2 | 2 |
| 1 | 2 | 1 | 2 |
| 1 | 2 | 1 | 1 |
| 1 | 1 | 3 | 3 |
| 3 | 1 | 2 | 3 |
| 3 | 1 | 2 | 2 |
| 1 | 1 | 2 | 1 |
| 2 | 1 | 1 | 3 |
| 3 | 1 | 1 | 2 |
| Total 36 | | | |

For the maintenance-oriented preschool children it can be observed from Table 5 that for all the classification tasks 7 out of 36 were able to respond at the advanced developmental stage, stage III, for all three classification tasks.

An inspection of this table reveals that for task 1, 14 children, for task 2, 11 children and for task 3, nine children were able to respond at third stage level of cognitive functioning. It is note-worthy that 19 children from the education-oriented preschools compared to only 7 children from the maintenance-oriented preschools were able to perform at a mature level on all the classification tasks.

Table 7 presents the comperative presentation of the distribution of children from education-oriented and maintenance-oriented preschools according to cognitive stages for classification tasks.

Table 7

Comparative Presentation of the Distribution of Children, from Education-Oriented and Maintenance Oriented Preschools According to Cognitive Stages for Classification Tasks

| Frequency of subjects responses for each stage | Cognitive stages | Number of children (f) | | | | | | Total stage responses of Education Oriented Preschool Subjects | Total stage responses of Maintenance Oriented Preschool Subjects |
|---|---|---|---|---|---|---|---|---|---|
| | | Classification Tasks | | | | | | | |
| | | 3 | | 2 | | 1 | | | |
| | | Orientation of the centers | | | | | | | |
| | | Edc. ori. cent. | Maint. ori. cent. | Edc. ori. cent. | Maint. ori. cent. | Edc. ori. cent. | Maint. ori. cent. | | |
| | 3 | 23 | 9 | 24 | 11 | 28 | 14 | 75 | 34 |
| | 2 | 2 | 13 | 5 | 7 | 7 | 20 | 14 | 50 |
| | 1 | 11 | 14 | 7 | 8 | 1 | 2 | 19 | 24 |
| | Total | 36 | 36 | 36 | 36 | 36 | 36 | 108 | 108 |

In comparing the performance of the education-oriented preschool children with the maintenance-oriented preschool children as shown in Table 7, it is observed that 75 (69.4 percent) of the responses of the education-oriented preschool children fall within the third stage for all classification tasks, while only 34 (31 percent) of the responses of the maintenance-oriented preschool children fall in this rauge.

Table 7 also shows that the responses of children from the maintenance-oriented preschools cumulate at the second stage with 50 (46.2 percent), while there are only 14 responses (12.9 percent) in this stage for the education-oriented preschool children. The frequency of responses at the beginning stage, Stage I is somewhat similar in both groups of subjects. We see 19 (17.5 percent) stage I responses for childrer from the education-oriented preschool, and 24 (22.2 percent) stage I responses for children from the maintenance-oriented preschools.

A one-tailed Man-Whitney-U test was used in testing the difference between the two kinds of preschool children in terms of their cognitive development, as evaluated by Piaget's classification tasks.

Results of this analysis revealed a significant difference in the classification behavior of the children in the differently oriented centers at the .005 level ($Z = -2.33$, $p$ .005). As hypothesized, children attending the education-oriented preschools perform at a cognitively more advanced stage than children attending maintenance-oriented preschools.

Seriation

Table 8 presents the frequency distribution of children in the education-oriented preschools for seriation tasks.

Inspection of this table shows that no child was able to give stage III responses to any of the three tasks for the seriation operations. Three children performed at the developmental level of stage II for all tasks. For task 1 a total of eleven children, for task 2 six children, and for task 3 four children were able to respond at the second stage of cognitive functioning.

Table 8

Frequency Distribution of Children Attending Education-Oriented Preschools for Seriation Tasks in Different Developmental Stages

| Number of children (f) | Stages | | |
|---|---|---|---|
| | Seriation Tasks | | |
| | Task 3 | Task 2 | Task 1 |
| 3 | 2 | 2 | 2 |
| 1 | 2 | 1 | 2 |
| 3 | 1 | 2 | 2 |
| 4 | 1 | 1 | 2 |
| 25 | 1 | 1 | 1 |
| T.36 | | | |

None of the subjects from maintenance-oriented preschools were able to respond at stage III level. Table 9 presents the response distribution of these children.

Table 9

Frequency Distribution of Children Attending Maintenance-Oriented Preschools for Seriation Tasks in Different Developmental Stages

| Number of children (f) | Stages | | |
|---|---|---|---|
| | Seriation Tasks | | |
| | Task 3 | Task 2 | Task 1 |
| 2 | 2 | 1 | 2 |
| 4 | 1 | 1 | 2 |
| 30 | 1 | 1 | 1 |
| T. 36 | | | |

It is also seen that none of the children were able to perform on all the three tasks at the developmental level of stage II. For Task 1 two children for task 2 and 3 no children performed in the second stage of cognitive functioning.

Table 10 is a comparative presentation of the distribution of children from education-oriented and maintenance-oriented preschools according to cognitive stages for the seriation tasks.

Table 10

Comparative Presentation of the Distribution of Children from Education-Oriented and Maintenance-Oriented Preschools According to Cognitive Stages for the Seriation Tasks 1, 2 and 3

| Frequency of subject responses for each stage | Cognitive stages | Number of Children (f) | | | | | | Total stage responses of Edc-or. preschool subjects | Total stage responses of Main.-or. Presc subjects |
|---|---|---|---|---|---|---|---|---|---|
| | | Seriation Tasks | | | | | | | |
| | | 3 | | 2 | | 1 | | | |
| | | Orientation of the centers | | | | | | | |
| | | Edc. ori. cent. | Maint. ori. cent. | Edc. ori. cent. | Maint. ori. cent. | Edc. ori. cent. | Maint. ori. cent. | | |
| | 3 | - | - | - | - | - | - | - | - |
| | 2 | 4 | 2 | 7 | 0 | 11 | 6 | 22 | 8 |
| | 1 | 32 | 34 | 29 | 36 | 25 | 30 | 86 | 100 |
| | Total | 36 | 36 | 36 | 36 | 36 | 36 | 108 | 108 |

As may be seen from Table 10, no child performed at the third stage level of cognitive functioning. Children attending the education-oriented preschools gave 22 (20.3 percent) stage 2 level responses on the seriation tasks, while those from the maintenance-oriented preschools gave only eight (7.4 percent) responses at this level of cognitive functioning. Most of the responses 86 (79.9 percent) for the education-oriented preschool children and 100 (92.5 percent) for the maintenance-oriented preschool children fall in the first stage.

A one tailed Mann-Whitney-U test was used in testing the difference between the two kinds of preschools on the cognitive behavior of children as evaluated by Piaget's seriation tasks. For seriation tasks the results show a difference at the .15 level of significance (Z- .15, p .5). This research hypothesized that the education-oriented preschool children would perform at a more mature stage on the seriation tasks as compared to the maintenance-oriented preschool children. The results show some difference, but the number of higher stage answers are still few among the education-oriented preschool subjects. Distribution of the subjects according to the developmental stages, and the computation of the statistical analysis can be seen in Appendix G.

# V. SUMMARY AND DISCUSSION

In this study the effects of maintenance and education-oriented preschool attendance on the cognitive development of five to six year old children have been investigated. It had been hypothesized that children attending the education-oriented preschools would cognitively develop faster compared to children attending the maintenance-oriented preschools. Classification and seriation tasks have been suggested by Piaget as some of the main indicators of cognitive functioning. These tasks were chosen by the present investigator in testing children's cognitive development.

It had been hypothesized that children attending the education-oriented preschools would perform at a higher cognitive stage on the classification tasks. This hypothesis was supported for the five year zero month, six year six month old children covered in this research. It is further noteworthy that subjects from the education-oriented preschools who performed at a significantly higher developmental level were younger by one month, on the average, than the other group. This finding of more mature cognitive functioning on classification tasks among the education-oriented preschool attenders supports the contention that the classification function among the cognitive skills can be aided in its development by certain procedures and correct timing in terms of the readiness of the child. From 36 education-oriented preschool attenders, 19 reached the point of correct performance for all three of the classification tasks; and 30 in all were able to give stage 3 responses on at least one task. The subjects of the present study reached this level at a younger age than subjects in the Inhelder and Piaget's study (1964). These results can be due to emphasis put on educational activities and curricula in the education-oriented preschools covered in the present study. The programs of these preschools covers teaching labels for colors, shapes and sizes. The children also gain experience playing with a variety of educational toys wihch are designed to teach an awareness of similarities and differences. On the other hand, in maintenance-oriented preschools only seven out of 36 children reached the point of correct performance for all classification tasks. It was observed that most of the subjects from the maintenance-oriented preschools could not even name the colors and shapes.

It had also been hypothesized that the education-oriented preschool attenders would perform at a higher cognitive stage for seriation tasks. This hypothesis on the performance on seriation tasks was not as strongly supported by the results. There was little difference between subjects attending the education and the maintenance-oriented preschools in terms of the number of responses in higher stages of development. Most of the responses could only be evaluated to be at the most basic cognitive level.

All of the subjects attending the maintenance and the education-oriented preschools performad at a more advanced level for the classificatio tasks than the seriation tasks. On the seriation tasks none of the children reached the advanced developmental level stage III, according to Piaget.

This can be explained by the fact that children of this age range may not yet have cognitively reached the point of readiness to be tought correct performance as stated by Piaget's theory.

According to Piaget, the first inklings of the seriation concept appear at about the ages of four or five, but the seriation operation can not be fully carried out until the age of seven. If we look at the stuation from this perspective the age group in this study is too young to test for stage III level of cognitive functioning on seriation tasks. The reasons for testing this age range were that Comprehensive Preschool Education Project is a longitudinal study covering the children's performance over four years. That is children of five at the beginning of the study would be nine years old by the end of the project. Thus these children are going to attain the ability to perform seriation tasks with or without any aid.

The second reason for not hesitating to asses this young group of children in terms of their ability to perform seriation problems is that some studies do not support Piaget's theory on the age of acquisition seriation behavior. According to Lavatelli (1975) when kindergarten children have experience with Piagetian activities, they perform better than those with no experience on seriation tasks (Evans, 1975). Also, despite Piaget's contention that children reach correct performance on seriation tasks at about the age of seven (Ginsburg and Opper, 1979), Siegel (1972) showed that when the verbal requirements of the tasks are minimized and objects

are limited, even the three year old children can manipulate the concept of seriation. Another study by Siegel (1974) supported the previous finding on the three year old children being able to learn to manipulate the seriation tasks. In these studies however, few objects were used (two, three or four stimulus series) while in Piaget's studies and in the present study there more materials were utilized and these material, were more complicated. There were two different kinds of series including ten dolls and ten sticks.

At the beginning of the study it was hypothesized that education provided in education-oriented preschools would speed up this cognitive functioning to the point of correct performance for the five to six year old age group on the seriation tasks. This was not confirmed that Piaget is right, and mature seriation concepts can not develop up to the age of seven. She thinks that the necessary prerequisites were not provided for seriation operations even for the education-oriented proschools.

In addition to the differences on the hypothesized dimensions, difference of language skills were observed between the two kinds of preschoolers in their communication with the experimenter during this research. The subjects from the education-oriented preschools communicated more easily with the experimenter and their responses were more clear than the maintenance-oriented children. It was also observed that the maintenance-oriented preschool children had less contact with adults due to the nature of the custodial setting.

A limitation of the study can be said to be the sample size (N=72). Data were obtained from a small sample. Therefore, generalizibility of the findings from this sample is questionable.

The results partially support the notion of positive effects of educationally-oriented preschools on cognitive development.

In Turkey as stated before there is a severe shortage of institution caring for children. There is even greater lack of education-oriented settings. It is not possible to know how many of the preschool centers can be classified as maintenance or education oriented in Turkey; but it is the belief of this researcher that most centers, especially those that lower socio-economic status children can attend, are of the maintenance-oriented type. The quality level of preschools differs widely. Recently there has been a growing interest in this matter both by the state and by

private sector. In the Tenth National Education Council (June 23-26, 1981) held in Ankara, a policy decison was made to start educational programs one year before primary school, especially in the socio-economically underprivileged areas. This decision is a positive step but not sufficient. In the United States Head Start Project was developed (1964) specifically for "disadvantaged" children. For the same purpose few years after developing the Head Start Project its effects were studied and findings showed that Head Start can be useful in some ways, especially if its objectives were similar to the school objectives (Yıldıran Stodolsky 1983). If intervention programs were not continued after the school years the effects tend to disappear as the child progresses in school.

It is well understood at present that preschool education can be of crucial importance both for the child's academic success and better social functioning.

All this is possible, as summarized by Yıldıran Stodolsky (1983), when the preschool provides the needed basic skills for formal schooling, when the parents involvement is realized, and when a continuation of education is made possible in the home environment. This preschool education can be force in proving remediation for deprived children and prevent future academic and social failure.

Since cognitive functioning is one very important aspect of all kinds of knowledge and understanding, the effects of preschool education on developing cognitive skills are of crucial importance.

The present study provides data to the expectation that proper intervention such as stimulating enriched environment accelerates the development of cognitive functioning. Further research in this area and in others covering perceptual and motor development, language development and socio-emotional development would help in assessing the differential effects of approaches and environments in preschool education. The programs designed to train teachers to meet the needs of the children better can be based on such studies. Through the accumulation of projects like this, it is hoped that a body of knowledge and its implementation to benefit our children in preschools will be achieved.

Appendix: A

## THE INTERVIEW FORM FOR THE SCHOOL DIRECTORS

## MOLAKAT FORMU

1. OKUL ADI
2. ÇALIŞMA SAATLARI
3. HANGİ YAŞ GRUPLARINA SERVİS VERİYOR?
4. ÇOCUK SAYISI
5. ÖĞRETMEN SAYISI
6. YARDIMCI SAYISI VE NİTELİĞİ
7. GRUP SAYISI
8. GRUPLARDAKİ ÇOCUK SAYISI
9. GRUPLARDAKİ ÇOCUK-ÖĞRETMEN ORANI
10. ÇOCUKLAR ÜNİFORMA GİYİYORLAR MI?
11. VELİLER NEREDEN? (FABRİKA İŞÇİLERİ, ÇEVREDEN)
12. GÜNLÜK PROGRAMINIZ NEDİR?
13. EĞİTSEL FAALİYETLERİNİZ NELERDİR?
14. SERBEST OYUN SAATLARINDA ÇOCUKLAR NE TÜR ETKİNLİKLER YAPARLAR?
15. BU SAATLARDA ÇOCUKLARA NE TÜR ARAÇ GEREÇLER VERİLİR?
16. GRUP FAALİYETLERİ NELERDİR? NE SIKLIKTA? (Her söylenen faaliyet için sorulur)
17. ÇEVREYE GEZİLER DÜZENLİYOR MUSUNUZ? NE GİBİ? NE SIKLIKTA?
18. ÇOCUKLARA ÇEŞİTLİ MESLER GRUPLARINI TANITMAYA ÇALIŞIYOR MUSUNUZ?

    ÖĞRETMEN HEMŞİRE POLİS vb.
19. ÇOCUKLAR, UYGULANAN FAALİYETLERE KATILIP KATILMAYACAKLARINA, KENDİLERİ Mİ KARAR VERİYORLAR, ÖĞRETMEN Mİ?
20. ÇOCUKLAR MEVCUT OYUNCAK, ARAÇ-GEREÇLERDEN HANGİLERİNİ İSTEDİKLERİ ZAMAN KULLANIRLAR, HANGİLERİNİ ÖĞRETMEN DAĞITIR?

21. ÇOCUKLARA BİREYSEL OLARAK MI, YOKSA GRUP HALİNDE Mİ YAKLAŞIYORSUNUZ?

- Bütün çocukların aynı etkinlikte, aynı anda yer almasını istiyor musunuz?

- Bir etkinlikten diğer bir etkinliğe geçişte çocuklar birbirlerini bekler mi?

22. UYGULADIĞINIZ / BENİMSEDİĞİNİZ DİSİPLİN YÖNTEMLERİ NELERDİR? NE GİBİ DURUMLARDA UYGULARSINIZ?

23. ÖĞRETMENLERİNİZİN BU PROGRAMDAKİ ROLÜ NEDİR?

a) Programın planlanması

b) Yönetilmesi

c) Uygulamada çocuklarla eş düzeyde paylaştıkları etkinlikler oluyor mu? Neler?

d) Çocuklar öğretmenlere nasıl hitap eder?

24. AİLELERLE NASIL İLİŞKİNİZ VAR?

NE GİBİ DURUMLARDA ANNELER SİZE GELİR?

NE GİBİ DURUMLARDA SİZ ONLARI ÇAĞIRIRSINIZ?

Appendix: B

# THE PRESCHOOL CENTER OBSERVATION FORM
# x
# GÖZLEM FORMU

## A. FİZİKSEL NİTELİKLER

1. Okul binası kaç katlı?
2. Gruplar bağımsız mı?
3. Çocukların kullandıkları eşyalar onların boyutlarında mı?

   Sandalye Masa Tuvaletler vb.

4. Bu eşyalar çocuk sayısıyla orantılı mı?
5. Çocukların özel eşyalarını koyacak bölümler var mı?
6. Bahçe var mı?
7. Gruplardan bahçeye çıkış var mı / veya?
8. Bahçeye ulaşmak çocuklar için kolay mı?
9. Isınma nasıl oluyor?
10. Yapay ve doğal aydınlatma yeterli mi?

## B. YUVADA KULLANILDIĞI GÖZLENEN ARAÇ-GEREÇ LİSTESİ

- Resim sehpası
- Pazen kaplı tahta
- Kukla için taşınabilen oyun sehpası
- Boya

  sulu toz krayon kuru
- makas
- boya fırçası
- kağıt, çeşitli

x Gözlem süresi içinde gözlenemeyenler sorulabilir.

- kil
- yoğurma maddeleri
- diğerleri - artık materyaller

## II. "Müzik Etkinlikleri" için Kullanılan Araç ve Gereçler

| | |
|---|---|
| Davullar | Tahta |
| Ziller | Armonika |
| Kaşıklar | Dümbelek |
| Üçgenler | Radyo |
| Marakas | Teyp |
| Flüt | Pikap |
| Tefler | |

## III. BLOK KÖŞESİ

Bloklar, çeşitli

| | | |
|---|---|---|
| Büyük | Küçük | Silindir |
| Üçgen | Tam çubuk | Yarım çubuk |
| Dörtte bir çubuk | X.Y. biçiminde sopalar | Eğimli blok |

Çatı blokları

## IV. EVCİLİK KÖŞESİ VE TEMSİLİ OYUN KÖŞESİ

| | | |
|---|---|---|
| bebekler | bebek yatakları | |
| bebek arabası | battaniyeler, şilteler ve yastıklar | |
| evcilik oyunu için eski plastik eşya | | |
| ufak masa ve sandalyeler | dolap | |
| tahta oyuncak | fırın | oyuncak telefon |

mutfak araçları temizlik araçları

çeşitli erkek / kadın giysileri silifonlar

çeşitli meslekleri simgeleyen giysiler:

Dr. çantası ve giysileri

hemşire başlıkları itfaiyeci

kaptan, subay şapkaları

değişik zorluk seviyesinde tahta bilmeceler

resimli eleştirmeli oyunlar

ufak blok takımları

renkli tahtadan sayma boncuklar

marangoz aletleri

SU OYUNLARINDA KULLANILAN ARAÇ VE GEREÇLER

ufak testiler süzgeçli kovalar

çeşitli boyutlarda taslar, leğenler

plastik şişeler kepçeler kamışlar

ilaç damlalıkları şampuan şişeleri huniler

süzgeçler yumurta çırpıcısı fırçalar

hortumlar sabun (kalıp veya toz)

AÇIK HAVA ETKİNLİKLERİNDE KULLANILAN ARAÇ VE GEREÇLER

Çeşitli boyda toplar çemberler

ip atlamak için kalın ipler kum havuzu

kovalar kaplar kaşıklar

ufak tabak-çanak tırmanma merdivenleri

ip ya da tahta merdiven bisiklet

ip ve bahçe hortumu — otomobil tekerlekleri

denge tahtası — atlama beygiri / tırmanma beygiri

salıncaklar — tahtaravalli

kaydırak — oyun sandıkları

DOĞA VE FEN BİLGİSİ VERMEK İÇİN KULLANILAN ARAÇ VE GEREÇLER

Mıknatıslar — Büyüteçler

B. boy bahçe ve oda termometresi — Cetveller

Ölçü aletleri — El aynaları

Makaralar, dişliler, vidalar, somunlar, kancalar

Hayvan köşesi

KİTAP KÖŞESİ

Çeşitli hikaye kitapları — Mecmualar

C. YUVADA GÖZLENİLEN ETKİNLİKLERİN LİSTESİ

I. YARATICI ANLATIM VE SANAT ETKİNLİKLERİ

Bloklar ve küplerle yapılan faaliyetler

Kil ve diğer yoğurma faaliyetleri

Evcilik köşesi faaliyetleri — kum oyunu

su oyunu — tahta işleri

boyama ve başka resim etkinlikleri:

sulu boya — parmak boyası

çıkartma boyası — sabun boyası

mum boya, tebeşir, boya kalemi

ruloya sarılmış ip baskı

kumaşa boya damlatma

ipe dizme

kesme yapıştırma işleri

simetrik desen çıkartma

çizgi çizme faaliyeti

II. TEMSİLİ OYUNLAR

evcilik köşesindeki oyunlar

kukla oynatımı

dramatize edilen hikayeler ve oyunlar

sembolik oyunlar

III. MÜZİK ETKİNLİKLERİ

müzikli-müziksiz hareket

müzik dinlemek

çalgı çalma etkinliği

şarkı söylemek

IV. DOĞA VE FEN BİLİMLERİ ETKİNLİKLERİ

Fizik çevreyle ve konularla ilgili örnekler:

| | |
|---|---|
| Taşıtlar | Tabiat hareketleri |
| İletişim araçları | Denge tartı |
| Hava durumları | Duyusal dereceler |

CANLILARLA İLGİLİ DOĞA BİLGİSİ ÖRNEKLERİ:

hayvanlar insanlar bitkiler yiyecekler

V. BEDENSEL ETKİNLİKLER (açık hava ve oyun odasında)

top oyunları

çizginin üzerinden yürüme

engelli oyun uygulaması

karenin ortasına basma

oyun alanını, bahçeyi temizlemek

cambazlık ya da cimnastik mindeki hareketleri

kolay cimnastik uygulamaları - bedeni çalıştırma oyunları

açık havada organize olmuş oyunlar oynanması

VI. DİL GELİŞTİRME ETKİNLİKLERİ

kitap okuma kitap hazırlama

masal öykü anlatma öyküleri canlandırma

kukla oynatma parmak oyunları

pazen kaplı tahtada öykü anlatma resimli anlatma

bilmeceler tekerlemeler şiir

VII. GEZİLER TERTİPLİYOR MUSUNUZ? (sorulabilir)

hayvanlarla ilgili gezi yerleri

insanlar ve çevreleri

doğaya ve mevsimlere göre canlıların, bitkilerin gelişmesini, büyümesini izlemek

taşıtlar ve makinalar konuk çağrımı

D. I. Çocuklar yeni bir etkinliğe grup halinde mi başlıyorlar / bir diğer etkinliğe grup halinde mi geçiyorlar?

yoksa birbirlerini beklemeden etkinlik değiştirebiliyorlar veya başlayabiliyorlar mı?

II. Öğretmenler çocukları kesin tavırlara yöneltiyorlar mı?

yoksa çocuğu kendi seçimini yapmakta serbest bırakıp gerektiğinde mi önerilerde bulunuyorlar?

Appendix: C

## THE INTERVIEW FORM FOR MOTHERS

### SORULAR: 1

Bugün size sadece birkaç şey sormak istiyorum.

1. Oğlunuzun / Kızınızın adı _____ değil mi?

   _____ yaşında değil mi?

2. Doğum tarihi neydi?
   (AŞAĞIDAKİ TABLOYA İLK SIRAYA İŞLEYİN)

3. Başka çocuğunuz var mı?

   Hayır 1

   Evet 2

   Kaç tane?

| 1 başka çocuksa | 1'den fazla ise |
|---|---|
| Onun adı ne? | En büyüğünün adı ne? |
| (ADINDAN BELLİ DEĞİLSE) Kız mı erkek mi? | Kız mı erkek mi? |
| Kaç yaşında? Doğum tarihi ne? | Kaç yaşında? Doğum tarihi ne? |
| Bu evde mi oturuyor? | Bu evde mi oturuyor? |
| (TABLOYA İŞLEYİN) | (HER BİRİMİ TABLOYA İŞLEYİN) |

| A. ÇOCUKLARIN İSİMLERİ (İsteğe Bağlı) | B. CİNSİYETİ | | C. DOĞUM TARİHİ | | D. YAŞI | E. OTURUYOR | | F. STAT |
|---|---|---|---|---|---|---|---|---|
| | Kız | Erkek | Ay | Yıl | | Evde | Başka Yerde | Evlat E nilmiş, önceki lilikte vs. |
| (1) | 1 | 2 | | | | 2 | 1 | |
| (2) | 1 | 2 | | | | 2 | 1 | |
| (3) | 1 | 2 | | | | 2 | 1 | |
| (4) | 1 | 2 | | | | 2 | 1 | |
| (5) | 1 | 2 | | | | 2 | 1 | |
| (6) | 1 | 2 | | | | 2 | 1 | |
| (7) | 1 | 2 | | | | 2 | 1 | |
| (8) | 1 | 2 | | | | 2 | 1 | |

4. Evinizde evlat edinmiş olduğunuz ya da evlat gibi baktığınız başka çocuk var mı? Mesela bir akraba çocuğu var mı?
Veya önceki bir evlilikten doğma olan var mı?
(TABLODA BELİRTİN. SÖYLEDİKLERİNDEN BAŞKA BÖYLE ÇOCUK VARSA TABLOYA EKLEYİN)

5. Bu evde oturan başka kimler var? Bunlar 'in nesi oluyor? Bunlar içinde evli olan veya daha önce evlenmiş olan var mı? (BÜYÜK ANNE / BÜYÜK BABALARIN ANA YA DA BABA TARAFINDAN OLDUĞUNU NOT EDİN) (BÜTÜN BİLGİLERİ TABLOYA İŞLEYİN)

| AKRABALIK BAĞI | MEDENİ HALİ |
|---|---|
| (01) | |
| (02) | |
| (03) | |
| (04) | |
| (05) | |
| (06) | |
| (07) | |
| (08) | |
| (09) | |
| (10) | |

(TABLODA KOCASINI BELİRTMEDİYSE)

6. Kocanızla beraber mi oturuyorsunuz?

| | | | |
|---|---|---|---|
| Evet | 1 | | |
| Hayır | 2 | ayrı | 1 |
| | | boşanmış | 2 |
| | | bazen evdedir bazen uzakta (işte vs.) | 3 |

Ne kadar zaman uzaktadır, ne kadar zaman evdedir?

7. Siz 'de çalışıyorsunuz değil mi? Hangi kısımda çalışıyorsunuz? Ne yapıyorsunuz?

8. Kaç yaşındasınız?

9. Kaçıncı sınıfa kadar okudunuz?

x (BİZİM GÖZLEM YAPTIĞIMIZ KURUMLARDA ÇALIŞMAYAN "YENİ" ANNELER İÇİN 4. SAYFADA, 10. SORUYA GEÇİN. O SAYFAYI BİTİRDİKTEN SONRA 8. SORUYA GERİ DÖNÜN.)

10. Kocanız kaçıncı sınıfa kadar okumuş?

11. Kocanız kaç yaşında?

12. Kocanız çalışıyor mu?

| | |
|---|---|
| Çalışıyor | 1 |
| Çalışmıyor | 2 |

A. Ne iş yapar (NE TİP BİR İŞTE ÇALIŞIR, NE YAPAR GİBİ SORULARLA AYRINTILI BİLGİ ALIN VE NOT EDİN. ÖRNEĞİ, KENDİ İÇİN Mİ, BAŞKASI İÇİN Mİ ÇALIŞTIĞI, İŞİNİN SEVİYESİ - İŞÇİ, USTA GİBİ- İŞYERİNİN BÖYÜKLÜĞÜ -KÜÇÜK İMALATHANE, FABRİKA GİBİ- BELLİ OLSUN. TARLA İŞİYSE, IRGAT, SAHİBİ GİBİ FARKLILAŞMALIRINI ORTAYA ÇIKARTIN)

B. (NE İŞ YAPTIĞI AÇIK DEĞİLSE:) Biraz anlatır mısınız / açıklar mısınız?

13. Çocuklarınız içinde eve yardım için çalışan veya para kazanan var mı?

| | |
|---|---|
| Evet | 2 |
| Hayır | 1 |

14. Ne yapar? (Ne yaparlar?)

Yardımlarınıza çok teşekkür ederim.

15. Para kazanmak için evin dışında bir iş yapıyor musunuz?

| | |
|---|---|
| Evet | 2 |
| Hayır | 1 |

16. Ne (yapıyorsunuz / yapıyordunuz)? (NE TİP BİR İŞTE ÇALIŞIYORSUNUZ, NE YAPIYORSUNUZ GİBİ SORULARLA DETAYLI BİLGİ ALIN VE NOT EDİN. ÖRNEĞİN, KENDİ İÇİN Mİ, BAŞKASI İÇİN Mİ ÇALIŞTIĞI, İŞİNİN SEVİYESİ -İŞÇİ, USTA GİBİ- İŞYERİNİN BÖYÜKLÜĞÜ -KÜÇÜK İMALATHANE, FABRİKA GİBİ- BELLİ OLSUN.)

17. Devamlı mı çalışıyorsunuz, zaman zaman mı?

| | |
|---|---|
| Devamlı | 2 |
| Zaman zaman | 1 |

18. Yılda altı aydan az mı çalışıyorsunuz?

| | |
|---|---|
| Altı aydan az | 2 |
| Altı aydan fazla | 1 |

19. Siz isteyken çocuklarınıza kim bakıyor?

.....
.....

---

MÜLAKATÇININ NOTLARI

(MÜLAKAT YAPTIĞINIZ EVDEN AYRILDIKTAN SONRA DOLDURUN):

1. Anne ilgili ve sizi kabul edici miydi?

| | |
|---|---|
| Evet, çok | 4 |
| Evet, biraz | 3 |
| Pek değil | 2 |
| Hiç değil | 1 |

2. Kendisiyle oturup konuşabilmek için ikna etmek gerekti mi?

| | |
|---|---|
| Evet | 1 |
| Biraz | 2 |
| Hayır | 3 |

3. Anne kısa mülakat süresince gergin, rahatsız, heyecanlı bir halde miydi, yoksa rahat mıydı? Eğer anne gergin idiyse, niye öyle olduğu hakkında düşüncenizi yazınız.

| | | |
|---|---|---|
| Çok gergin | 1 | Düşünceleriniz |
| Biraz gergin | 2 | |
| Rahatça | 3 | |
| Çok rahat | 4 | |

4. Anneyle ilgili ilk izleniminiz nasıl?

| | |
|---|---|
| Uyanık, meraklı, ilgili | 4 |
| Orta düzeyde ilgili | 3 |
| İlgisizce, pek uyanık gözükmüyor | 2 |
| Çok ilgisiz, içine kapanık, hiç meraklı ve uyanık değil | 1 |

5. Anne, ev durumu veya mülakat durumu hakkında belirtmek istediğiniz özel noktalar var mı?

Appendix: D

Mothers' Educational Level for Education Oriented Preschoolers

| Number of Mothers | Education Level |
|---|---|
| 2 | Illiterate |
| 1 | 3rd Grade |
| 1 | 4th Grade |
| 25 | 5th Grade |
| 2 | 6th Grade |
| 3 | 8th Grade |
| 1 | 11th Grade |
| 1 | Unknown |
| Total 36 | |

Mothers' Education Level for Maintenance-Oriented Preschoolers

| Number of Mothers | Education Level |
|---|---|
| 1 | Illiterate |
| 1 | 2nd Grade |
| 24 | 5th Grade |
| 2 | 6th Grade |
| 1 | 11th Grade |
| 7 | Unknown |
| Total 36 | |

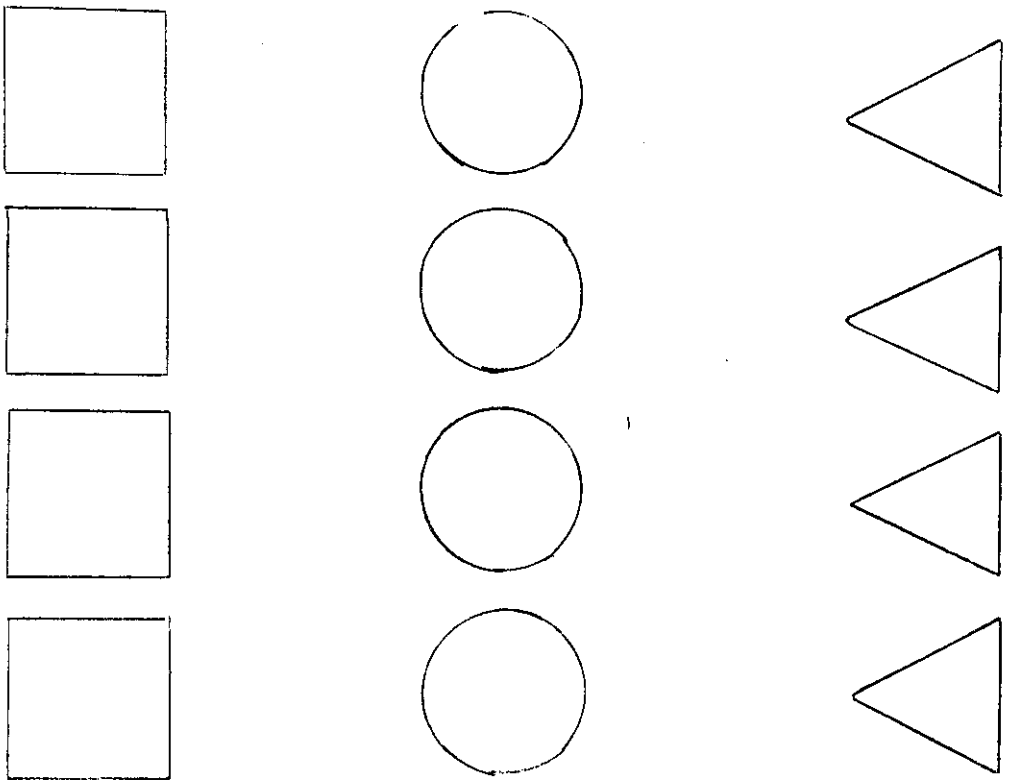
Chronological Age of Maintenance-Oriented Preschoolers when the Tasks Were Applied.

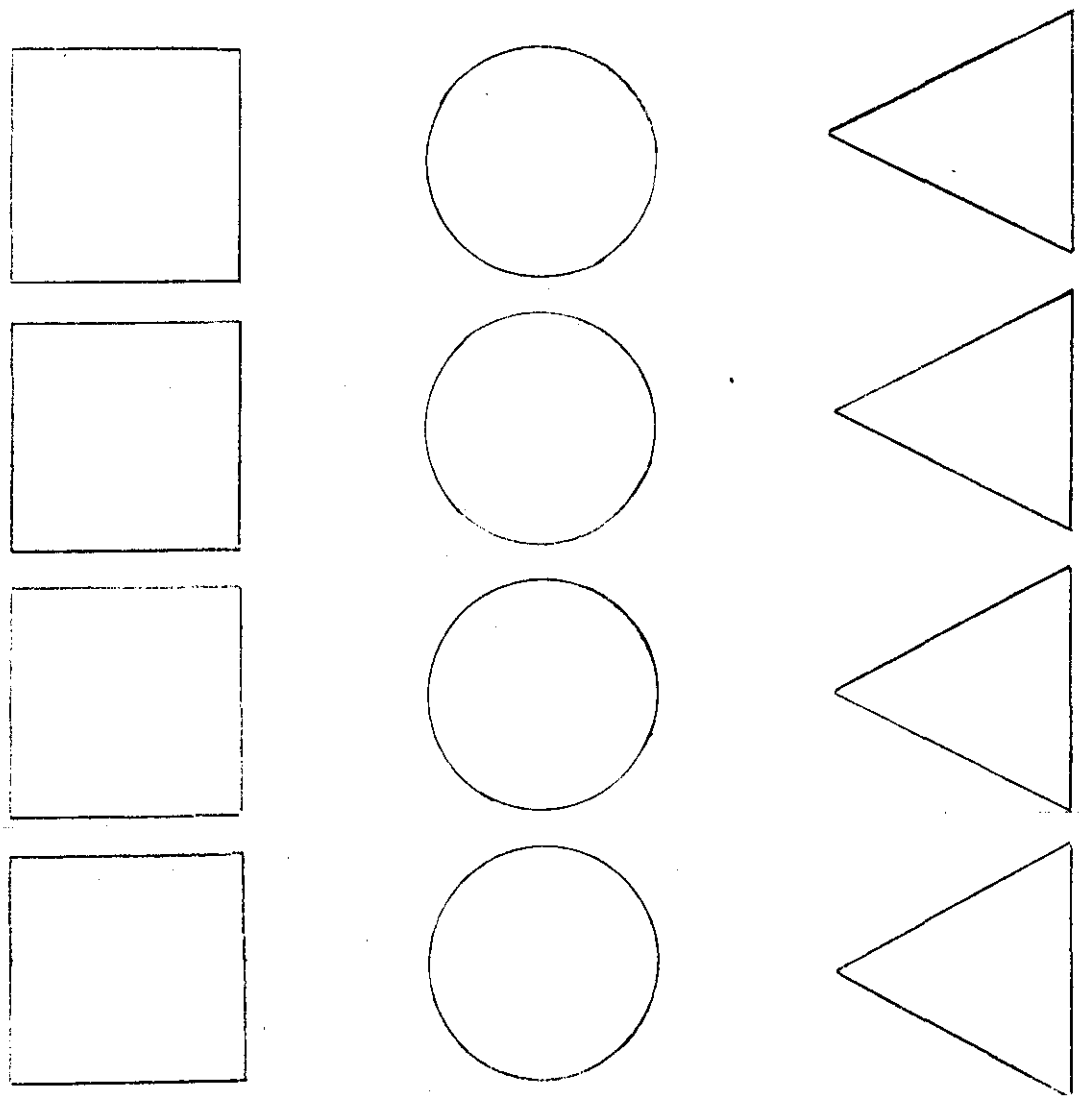
| Subject No. | Birth Date | Tasks Application Date | Chronological Age |
|---|---|---|---|
| 1 | 28. 9.1977 | 12.5.1983 | 5/ 7/14 |
| 2 | 21. 9.1977 | 12.5.1983 | 5/ 7/11 |
| 3 | 12.10.1977 | 12.5.1983 | 5/ 7/ 0 |
| 4 | 15.12.1977 | 12.5.1983 | 5/ 2/27 |
| 5 | 12. 6.1977 | 9.5.1983 | 5/ 8/27 |
| 6 | 30.12.1977 | 9.5.1983 | 5/ 4/ 9 |
| 7 | 10. 8.1977 | 9.5.1983 | 5/ 4/29 |
| 8 | 7. 8.1977 | 9.5.1983 | 5/ 9/ 2 |
| 9 | 22.10.1977 | 7.6.1983 | 5/ 7/15 |
| 10 | 26. 8.1977 | 7.6.1983 | 5/ 9/11 |
| 11 | 10. 8.1977 | 7.6.1983 | 5/ 9/27 |
| 12 | 3. 7.1977 | 23.6.1983 | 5/11/20 |
| 13 | 6. 9.1977 | 23.6.1983 | 5/ 9/17 |
| 14 | 15. 4.1977 | 23.6.1983 | 6/ 2/ 8 |
| 15 | 6. 3.1977 | 23.6.1983 | 6/ 3/17 |
| 16 | 16. 3.1977 | 23.6.1983 | 6/ 3/ 7 |
| 17 | 3. 8.1977 | 30.5.1983 | 5/ 9/27 |
| 18 | 20. 8.1977 | 30.5.1983 | 5/ 9/10 |
| 19 | 25. 6.1977 | 30.5.1983 | 5/11/ 5 |
| 20 | 28. 5.1977 | 30.5.1983 | 6/ 0/ 2 |
| 21 | 9. 6.1977 | 30.5.1983 | 5/11/21 |
| 22 | 21.12.1977 | 30.5.1983 | 5/ 5/ 9 |
| 23 | 30. 8.1977 | 30.5.1983 | 5/ 9/ 0 |
| 24 | 10. 5.1977 | 2.6.1983 | 6/ 0/22 |
| 25 | 19. 7.1977 | 2.6.1983 | 5/10/13 |
| 26 | 16. 8.1977 | 2.6.1983 | 5/ 9/16 |
| 27 | 26.12.1977 | 6.6.1983 | 5/ 5/10 |
| 28 | 6.12.1977 | 6.6.1983 | 5/ 6/ 0 |
| 29 | 22. 2.1978 | 15.6.1983 | 5/ 3/23 |
| 30 | 11.10.1977 | 15.6.1983 | 5/ 8/ 4 |
| 31 | 20.11.1977 | 15.6.1983 | 5/ 6/25 |
| 32 | 19. 8.1977 | 14.6.1983 | 5/ 7/25 |
| 33 | 4.12.1977 | 14.6.1983 | 5/ 6/10 |
| 34 | 31. 7.1977 | 14.6.1983 | 5/10/13 |
| 35 | 22.10.1977 | 16.6.1983 | 5/ 7/22 |
| 36 | 12.12.1977 | 14.6.1983 | 5/ 6/22 |

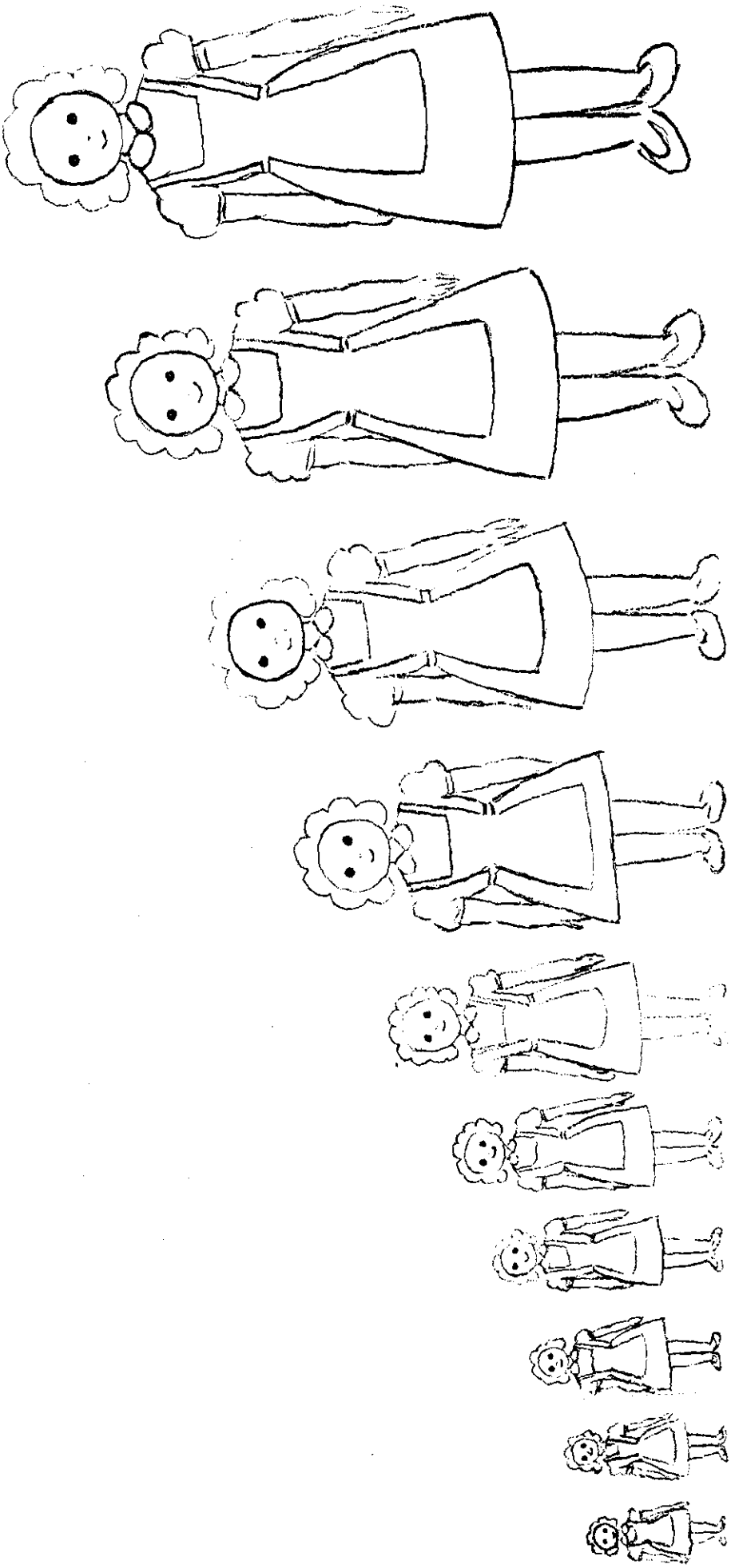
Appendix: E

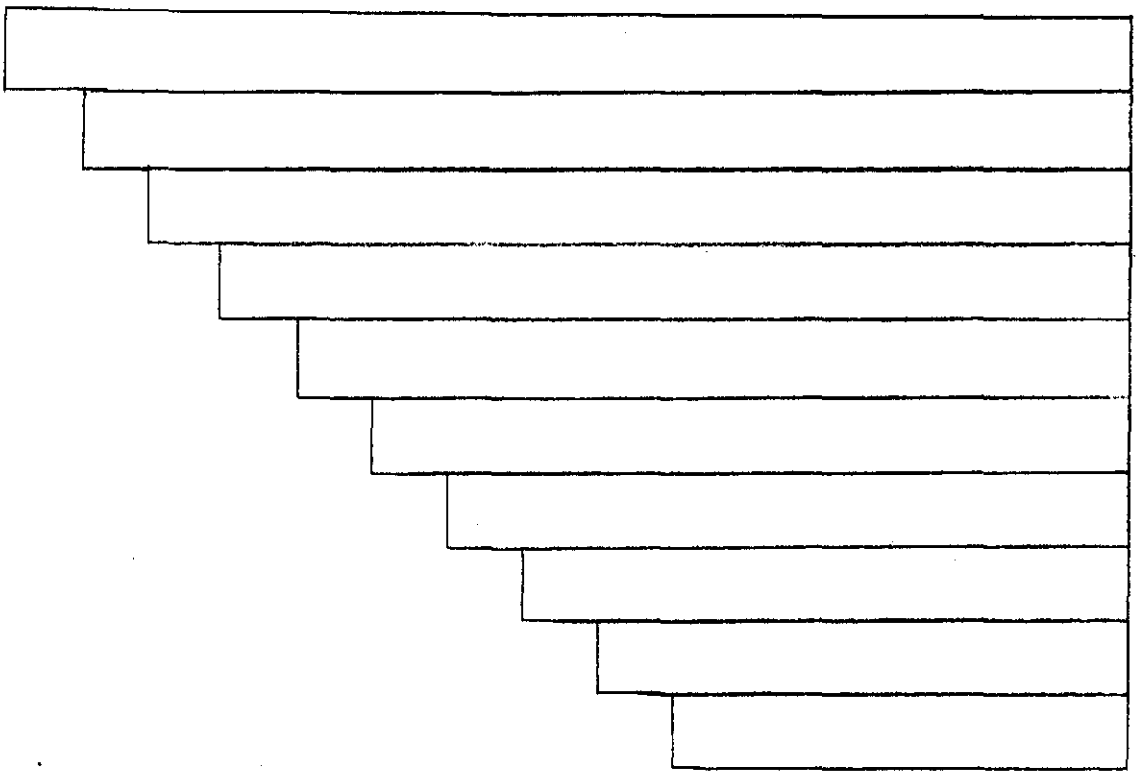
Documentation of Chronological Age of Education-Oriented Preschoolers at the Time of the Application of the Classification and Seriation Tasks

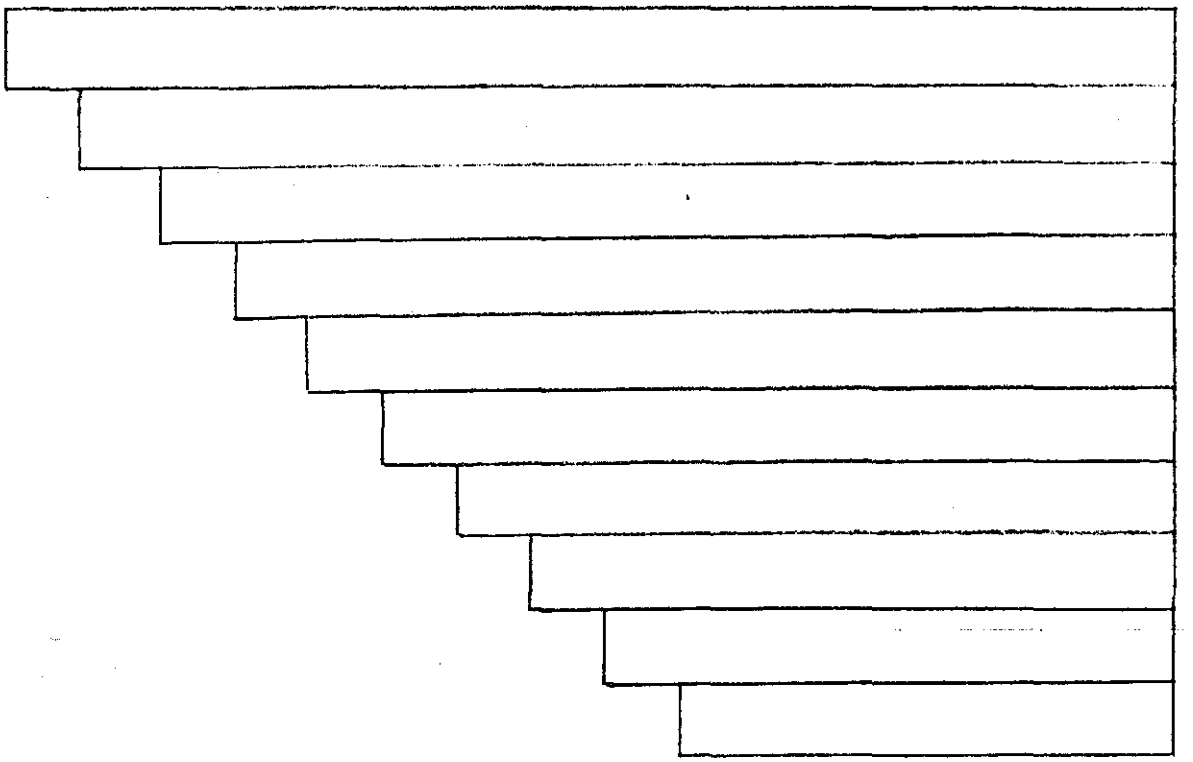
| Subject No. | Birth Date | Tasks Application Date | Chronological Age |
|---|---|---|---|
| 1 | 4. 1.1977 | 21.6.1983 | 6/ 5/17 |
| 2 | 15.11.1977 | 21.6.1983 | 5/ 7/ 7 |
| 3 | 14. 7.1977 | 21.6.1983 | 5/11/ 7 |
| 4 | 26. 4.1978 | 21.6.1983 | 5/ 1/25 |
| 5 | 16. 4.1977 | 21.6.1983 | 6/ 2/ 5 |
| 6 | 24. 5.1977 | 22.6.1983 | 6/ 0/28 |
| 7 | 15. 2.1977 | 22.6.1983 | 5/ 4/ 7 |
| 8 | 23. 4.1978 | 22.6.1983 | 5/ 1/29 |
| 9 | 22. 3.1977 | 8.6.1983 | 5/ 2/16 |
| 10 | 15.12.1977 | 8.6.1983 | 5/ 5/23 |
| 11 | 7. 7.1977 | 13.6.1983 | 5/11/ 6 |
| 12 | 30.12.1977 | 13.6.1983 | 5/ 5/13 |
| 13 | 27. 2.1978 | 13.6.1983 | 5/ 3/16 |
| 14 | 9. 4.1977 | 13.6.1983 | 6/ 2/ 4 |
| 15 | 23.12.1977 | 13.6.1983 | 5/ 5/20 |
| 16 | 8. 3.1977 | 20.6.1983 | 6/ 3/12 |
| 17 | 17. 2.1978 | 20.6.1983 | 5/ 4/ 3 |
| 18 | 24. 9.1977 | 20.6.1983 | 5/ 8/16 |
| 19 | 22. 1.1977 | 13.5.1983 | 6/ 3/21 |
| 20 | 6. 6.1977 | 16.5.1983 | 5/11/10 |
| 21 | 29. 4.1977 | 16.5.1983 | 6/ 0/17 |
| 22 | 22. 2.1978 | 16.5.1983 | 5/ 2/24 |
| 23 | 3. 5.1978 | 16.5.1983 | 5/ 0/13 |
| 24 | 1. 5.1977 | 16.5.1983 | 6/ 0/15 |
| 25 | 22. 2.1978 | 24.5.1983 | 5/ 3/ 2 |
| 26 | 15. 1.1978 | 16.6.1983 | 5/ 5/ 1 |
| 27 | 14. 3.1977 | 24.5.1983 | 6/ 2/10 |
| 28 | 13. 4.1977 | 24.5.1983 | 6/ 1/11 |
| 29 | 29. 3.1977 | 24.5.1983 | 6/ 1/25 |
| 30 | 12.11.1977 | 24.5.1983 | 5/ 6/12 |
| 31 | 22. 5.1977 | 9.6.1983 | 6/ 0/17 |
| 32 | 4. 3.1978 | 9.6.1983 | 5/ 3/ 5 |
| 33 | 22. 2.1978 | 9.6.1983 | 5/ 3/17 |
| 34 | 28. 4.1978 | 9.6.1983 | 5/ 1/11 |
| 35 | 28. 3.1978 | 16.6.1983 | 5/ 2/18 |
| 36 | 14. 7.1977 | 16.6.1983 | 5/ 1/ 2 |











Appendix: G

Documentation of the Application of Mann Wihtney U Method for Classification and Seriation Tasks.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. | 333 | | 27. | 332 | | 55. | 122 | |
| 2. | 333 | | 28. | 332 | 28.5 | 56. | 122 | |
| 3. | 333 | | 29. | 332 | | 57. | 122 | 57.5 |
| 4. | 333 | | 30. | 332 | | 58. | 122 | |
| 5. | 333 | | 31. | 313 | 31.5 | 59. | 122 | |
| 6. | 333 | | 32. | 313 | | 60. | 122 | |
| 7. | 333 | | 33. | 232 | 33.0 | 61. | 121 | 61.0 |
| 8. | 333 | | 34. | 223 | 34.0 | 62. | 113 | |
| 9. | 333 | | 35. | 222 | | 63. | 113 | |
| 10. | 333 | | 36. | 222 | | 64. | 113 | |
| 11. | 333 | | 37. | 222 | | 65. | 113 | 64.5 |
| 12. | 333 | | 38. | 222 | | 66. | 113 | |
| 13. | 333 | 13.5 | 39. | 222 | | 67. | 113 | |
| 14. | 333 | | 40. | 222 | 40.0 | 68. | 112 | |
| 15. | 333 | | 41. | 222 | | 69. | 112 | |
| 16. | 333 | | 42. | 222 | | 70. | 112 | 69.5 |
| 17. | 333 | | 43. | 222 | | 71. | 112 | |
| 18. | 333 | | 44. | 222 | | 72. | 111 | 72.0 |
| 19. | 333 | | 45. | 222 | | | | |
| 20. | 333 | | 46. | 212 | 46.0 | | | |
| 21. | 333 | | 47. | 211 | 47.0 | | | |
| 22. | 333 | | 48. | 133 | | | | |
| 23. | 333 | | 49. | 133 | 49.5 | | | |
| 24. | 333 | | 50. | 133 | | | | |
| 25. | 333 | | 51. | 133 | | | | |
| 26. | 333 | | 52. | 123 | | | | |
| | | | 53. | 123 | 53.0 | | | |
| | | | 54. | 123 | | | | |

R = (26x13.5) + (4x28.5) + (2x31.5) + (1x33) + (11x40) + (1x46) + (1x47) + (4.49.5) + (3x53) + (6x57.5) + (1x61) + (6x64.5) + (4x69.5) + (1x72)

R = 2628

| Education-Oriented Preschool Attenders | | | Maintenance-Oriented Preschool Attenders | | |
|---|---|---|---|---|---|
| 1. | 333 | | 1. | 333 | |
| 2. | 333 | | 2. | 333 | |
| 3. | 333 | | 3. | 333 | |
| 4. | 333 | | 4. | 333 | 13.5 |
| 5. | 333 | | 5. | 333 | |
| 6. | 333 | | 6. | 333 | |
| 7. | 333 | | 7. | 333 | |
| 8. | 333 | | 8. | 332 | |
| 9. | 333 | 13.5 | 9. | 332 | 28.5 |
| 10. | 333 | | 10. | 232 | 33.0 |
| 11. | 333 | | 11. | 223 | 34.0 |
| 12. | 333 | | 12. | 222 | |
| 13. | 333 | | 13. | 222 | |
| 14. | 333 | | 14. | 222 | |
| 15. | 333 | | 15. | 222 | |
| 16. | 333 | | 16. | 222 | 40.0 |
| 17. | 333 | | 17. | 222 | |
| 18. | 333 | | 18. | 222 | |
| 19. | 333 | | 19. | 222 | |
| 20. | 332 | | 20. | 222 | |
| 21. | 332 | 28.5 | 21. | 212 | 46.0 |
| 22. | 313 | | 22. | 211 | 47.0 |
| 23. | 313 | 31.5 | 23. | 133 | 49.5 |
| 24. | 222 | | 24 | 123 | |
| 25. | 222 | 40.0 | 25. | 123 | 53.0 |
| 26. | 133 | | 26. | 123 | |
| 27. | 133 | 49.5 | 27. | 122 | |
| 28. | 133 | | 28. | 122 | 57.5 |
| 29. | 122 | | 29. | 122 | |
| 30. | 122 | 57.5 | 30. | 121 | 61.0 |
| 31. | 122 | | 31. | 113 | 64.5 |
| 32. | 113 | | 32. | 113 | |
| 33. | 113 | | 33. | 112 | |
| 34. | 113 | 64.5 | 34. | 112 | 69.5 |
| 35. | 113 | | 35. | 112 | |
| 36. | 111 | 72.0 | 36. | 112 | |

$R_E = 256.5 + 57 + 63 + 80 + 148.5 + 172.5 + 258 + 72$

$R_E = 1107.5$

$R_M = 94.5 + 57 + 33 + 34 + 360 + 46 + 47 + 49.5 + 159 + 172.5 + 61 + 129 + 278$

$R_M = 1520.5$

$R_1 = R_E \qquad R_2 = R_M$

$N_1 = N_E \qquad N_2 = N_M$

$$Z = \frac{R_E + R_M - (N_E + N_M)(N + 1) / 2}{\sqrt{N_E N_M (N + 1) / 3}}$$

$$Z = \frac{1107.5 + 1520.5}{\sqrt{1296.73 / 3}} = \frac{- 413}{177.59}$$

$Z = - 2.33$

Application of Mann Whitney U Method for Seriation Tasks

| | | | | | |
|---|---|---|---|---|---|
| 1. | 222 | | 41. | 111 | |
| 2. | 222 | 2 | 42. | 111 | |
| 3. | 222 | | 43. | 111 | |
| 4. | 212 | | 44. | 111 | |
| 5. | 212 | 5 | 45. | 111 | |
| 6. | 212 | | 46. | 111 | |
| 7. | 122 | | 47. | 111 | |
| 8. | 122 | 8 | 48. | 111 | |
| 9. | 122 | | 49. | 111 | |
| 10. | 112 | | 50. | 111 | |
| 11. | 112 | | 51. | 111 | |
| 12. | 112 | | 52. | 111 | |
| 13. | 112 | | 53. | 111 | |
| 14. | 112 | 13.5 | 54. | 111 | |
| 15. | 112 | | 55. | 111 | |
| 16. | 112 | | 56. | 111 | |
| 17. | 112 | | 57. | 111 | 45 |
| 18. | 111 | | 58. | 111 | |
| 19. | 111 | | 59. | 111 | |
| 20. | 111 | | 60. | 111 | |
| 21. | 111 | | 61. | 111 | |
| 22. | 111 | | 62. | 111 | |
| 23. | 111 | | 63. | 111 | |
| 24. | 111 | | 64. | 111 | |
| 25. | 111 | | 65. | 111 | |
| 26. | 111 | | 66. | 111 | |
| 27. | 111 | | 67. | 111 | |
| 28. | 111 | | 68. | 111 | |
| 29. | 111 | | 69. | 111 | |
| 30. | 111 | | 70. | 111 | |
| 31. | 111 | | 71. | 111 | |
| 32. | 111 | | 72. | 111 | |
| 33. | 111 | | | | |
| 34. | 111 | | | | |
| 35. | 111 | | | | |
| 36. | 111 | | | | |
| 37. | 111 | | | | |
| 38. | 111 | | | | |
| 39. | 111 | | | | |
| 40. | 111 | | | | |

$R = (3x2) + (3x5) + (3x8) + (8x13.5) + (55x45)$

$R = 2628$

| Education-Oriented Preschool Attenders | | Maintenance-Oriented Preschool Attenders | |
|---|---|---|---|
| 1. 222 | | 1. 212 | 5 |
| 2. 222 | 2 | 2. 212 | |
| 3. 222 | | 3. 112 | |
| 4. 212 | 5 | 4. 112 | 13.5 |
| 5. 122 | | 5. 112 | |
| 6. 122 | 8 | 6. 112 | |
| 7. 122 | | 7. 111 | |
| 8. 112 | | 8. 111 | |
| 9. 112 | 13.5 | 9. 111 | |
| 10. 112 | | 10. 111 | |
| 11. 112 | | 11. 111 | |
| 12. 111 | | 12. 111 | |
| 13. 111 | | 13. 111 | |
| 14. 111 | | 14. 111 | |
| 15. 111 | | 15. 111 | |
| 16. 111 | | 16. 111 | |
| 17. 111 | | 17. 111 | |
| 18. 111 | | 18. 111 | |
| 19. 111 | | 19. 111 | |
| 20. 111 | | 20. 111 | |
| 21. 111 | | 21. 111 | 45 |
| 22. 111 | 45 | 22. 111 | |
| 23. 111 | | 23. 111 | |
| 24. 111 | | 24. 111 | |
| 25. 111 | | 25. 111 | |
| 26. 111 | | 26. 111 | |
| 27. 111 | | 27. 111 | |
| 28. 111 | | 28. 111 | |
| 29. 111 | | 29. 111 | |
| 30. 111 | | 30. 111 | |
| 31. 111 | | 31. 111 | |
| 32. 111 | | 32. 111 | |
| 33. 111 | | 33. 111 | |
| 34. 111 | | 34. 111 | |
| 35. 111 | | 35. 111 | |
| 36. 111 | | 36. 111 | |

$R_E = 1214$ $R_M = 1414$

$R_1 = R_E$ $R_2 = R_M$

$N_1 = N_E$ $N_2 = N_M$

$$Z = \frac{R_E - R_M - (N_E - N_M)(N + 1) / 2}{\sqrt{N_E N_M (N + 1) / 3}}$$

$$Z = \frac{1214 - 1414}{\sqrt{1296.73/3}} = \frac{- 200}{177.59}$$

$Z = - 1.13$

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