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CONTENTS

1-16 *The Terms Used in Gifted and Talented Education in Turkey, Relevant Legal Framework and Educational Practices*
Esra Omeroglu, Rabia Sarikaya, H. Elif Daglioglu, Ebru Kilic Cakmak, Sercin Karatas, Safiye Arici Bulut, M. Gulsah Sahin, Osman Sabanci, Volkan Kukul, Aysun Turupcu Dogan, Osman Basit

17-30 *Father Involvement, Early Intervention Program and Well-being of Children with Special Needs*
Mohamad Ilmee Mohamad Zin, Mariani Md Nor

31-33 *Family-Centered Early Intervention: Supporting Infants and Toddlers in Natural Environments by Sharon A. Raver & Dana C. Childress (**Book Review)***
Binnur Yıldırım Hacıibrahimoğlu

34-49 *Arithmetic School Readiness of Preschoolers with Hearing Impairment*
Asha Yathiraj, Gowramma Ittira Poovaiah

50-65 *What is Special in Special Education from the Inclusive Perspective?*
Juliene Madureira Ferreira

From the editors,

Volume 9, Issue 1, June 2017

Dear INT-JECSE readers and contributors,

We are excited to be with you with the first issue of ninth volume of the INT-JECSE. We would like to extend our appreciations to all who contributes by submitting or reviewing manuscripts or have been readers of the INT-JECSE. In our first issue of the ninth year, you will find five articles on various topics of young children with special needs and their families or professionals.

The first article written by Esra Omeroglu, Rabia Sarikaya, H. Elif Daglioglu, Ebru Kilic Cakmak, Sercin Karatas, Safiye Arici Bulut, M. Gulsah Sahin, Osman Sabanci, Volkan Kukul, Aysun Turupcu Dogan and Osman Basit entitled as "The Terms Used in Gifted and Talented Education in Turkey, Relevant Legal Framework and Educational Practices". Mohamad Ilmee Mohamad Zin & Mariani Md Nor are the authors of the second article entitled as "Father Involvement, Early Intervention Program and Well-being of Children with Special Needs".

In the third article, the author Binnur Yildirim Haciibrahimoglu reviewed a book with the title of "Family-Centered Early Intervention: Supporting Infants and Toddlers in Natural Environments" written by Sharon A. Raver Dana C. Childress. The fourth article entitled as "Arithmetic School Readiness of Preschoolers with Hearing Impairment" was written by Asha Yathiraj and Gowramma Ittira Poovaiah. Juliene Madureira Ferreira is the author of the fifth and last article entitled as "What is Special in Special Education from the Inclusive Perspective?"

Looking forward to being with you in December 2017 issue…

Esra Omeroglu [1]
Rabia Sarikaya [2]
H. Elif Daglioglu [3]
Ebru Kilic Cakmak [4]
Sercin Karatas [5]
Safiye Arici Bulut [6]
M. Gulsah Sahin [7]
Osman Sabanci [8]
Volkan Kukul [9]
Aysun Turupcu Dogan [10]
Osman Basit [11]

The Terms Used in Gifted and Talented Education in Turkey, Relevant Legal Framework and Educational Practices

Abstract

Giftedness/talentedness is one of the areas that is not fully defined yet, and its meaning and scope are highly debated in parallel with the concept of intelligence. Discussions about how giftedness/talentedness can be conceptualized, identified, supported and predicted are still ongoing. The concept of giftedness/talentedness and the initial studies on the education of talented and gifted pupils seem to extend to Plato. In this study, firstly the definitions of leading names in the field about giftedness were examined and then field-specific terms were tried to be described. Many documents especially The Constitution of Turkish Republic, laws, decree laws, by laws, circulars and the Convention on the Rights of the Child have been examined in relation to the topic. In terms of the practices in the field of education, the Ottoman Empire period was briefly reviewed and information about the practices in Turkey was given. As a result, despite all the work mentioned, it has been found that there are various problems in the education of gifted and talented children and in supporting their skills. In order to solve the problems experienced by talented and gifted children in Turkey, it is necessary to develop a government policy regarding the education of talented and gifted children.

Keywords: Talented and gifted education, definition of talented and gifted, educational studies on talented and gifted education in Turkey

Introduction

It can be said that we owe the civilization achieved from prehistoric ages until today, outstanding developments in the fields such as science, art, technique, fine arts, thought and etc. to those who are creative, determined and gifted/talented people with the positive and negative aspects.

Some countries have developed policies to educate and employ gifted/talented people, being aware of this significant potential in their own hands. In this context, the definitions that are accepted as universal in relation to this concept of gifted/talented individuals in Turkey, the legal framework and the educational practices are discussed.

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Definitions and Terminology Used about Giftedness/Talentedness

Giftedness/talentedness is one of the areas that are not fully defined yet whose meaning and content are highly debated in parallel with the concept of intelligence. However, diversity in the area of giftedness/ talentedness is very high. Gifted/talented individuals may be universally encountered in all cultures, ethnic and socioeconomic groups. However, debates about how giftedness/talentness can be conceptualized, diagnosed, supported and predicted are still ongoing (Sternberg, 2007).

In the historical process, the first studies about the concept of giftedness/talentedness and the education of gifted/talented individuals seem to extend to Platon. They had been defined as "Their memory are strong. They do not be easily mistaken. They have robust and reasonable jurisdiction." in the book written by Platon about the idealistic organization of the society which is necessary for the administration of the societies and the election and training of the administrators (Enç, 1979). The education system that Platon proposed to educate diplomats was firstly put into practice by Ottoman Empire with the "*Palace Schools*" (Akkutay, 1984; Enç, 1979; Özsoy, Özyürek and Eripek, 1989).

Some countries have developed policies to educate and employ gifted/talented people in recognition of the significant potential in their hands. In this regard, the common definitions, legal framework and educational practices about gifted/talented people in Turkey are discussed.

Until the establishment of the Republic of Turkey from the Ottoman Empire, there is no featured study about gifted/talented people. In this process, studies conducted mostly in Europe and America are drawing attention. After these studies, it can be said that most of the definitions about giftedness/talentedness are accepted in our country, too. These definitions are briefly mentioned below.

According to Terman (1925), who is one of the pioneers of this field, those who score at the upper limit of 1% in standard intelligence tests should be described as "gifted". However, from the middle of the 20th century, this definition has begun to fell from favor as a result of intelligence becoming a concept that involves many talents (Akarsu, 2001).

According to the Marland report, published in the United States in 1972, gifted/talented children were defined as "*Children who perform well in one or more of these six areas, including general mental ability, special ability in a certain academic field, creative and productive thinking, leadership ability, talent in visual performing arts, and psychomotor ability*".

Renzulli (1986), one of those who came to the fore after this definition of the Marland Report, reviewed the successful figures and proposed the triple circle model. In the triple circle model, it has been suggested that children should have a certain level of performance on each of the three basic dimensions of ability, creativity and motivation over normal. Gardner (1983; 1991), who is contemporary with Renzulli, has brought a different perspective to intelligence with the theory of multiple intelligences. Gardner has shown that intelligence can not be assessed in a single dimension, that is, only verbally or only numerically, and that it must be also discussed in different dimensions. Correspondingly, according to Gardner, intelligence is the capacity to solve problems and create new products and new solutions by overcoming problems experienced in different situations and incidents in life.

One of the studies to explain the concept of giftedness and talentedness belongs to Gagné. Gagné (1991) has drawn attention to the differences between giftedness and talentedness, describing giftedness as a power over the average of human ability, and talentness as a performance over the average on a specific area.

Morelock (1992) has defined giftedness/talentedness as "asynchronous (incompatible/nonsynchronous) development, that presents internal experiences qualitatively and quantitatively different from normal development standards and includes advanced cognitive abilities" by drawing attention to the developmental characteristics of gifted and talented children, particularly to preschool period, in which development is the fastest.

In 1991, the Ministry of National Education made the 1st Special Education Council in Turkey in parallel with the devel-

opments in the identification and education of gifted and talented children in the world and adopted a definition similar to the definition of the American Education Commission. The gifted and talented child is defined as "*a child determined by specialists of the subject who perform at a high level in terms of her/his general and/or special abilities, according to her/his peers*" (MoNE, 1991a). In addition, this definition has been updated as "*Highly performing individual according to his / her peers in intelligence, creativity, art, sports, leadership capacity or special academic fields*" in the Directorate of Special Education Services published in 2006 (MoNE, 2006a).

As a result, while drawing the conceptual framework of giftedness/ talentedness, different terms are used in Turkey as well as terms generally accepted in the world. These are;

Gifted: Individuals who have intelligence level above average at least two standard deviations in intelligence tests.

Gifted and talented children: It is the term used by The World Council for Gifted and Talented Children for individuals who are superior in the intelligence and/or talent areas and in addition, it is the most widely adopted term by many countries and specialists in the field.

Superior talent: It is the term used by some researchers, considering intelligence and special talents under the concept of "superior talent" and categorizing under six areas, general mental ability, special academic ability, creative and productive thinking ability, leadership ability, ability in visual arts and psychomotor skill.

Special talent: It is the term that has been started to be used by the Ministry of National Education in Turkey for gifted and talented children after 2010.

Legal Framework

In this section, notably the constitution, related legislation, statutory decrees, regulation, directions and child rights conventions current in Turkey, which are directed at gifted/talented individuals were examined. It was also mentioned how the subject is addressed in development plans and National Education Councils in the country.

Constitution

The first law that treats gifted / talented individuals as a right to benefit from both general and special education is the 1924 Constitution. In this Constitution, Article 80 stated that "All types of education is free under the supervision and control of the government and under the law" and Article 87 stated that "Both males and females, all Turkish people are obliged to pass primary education. Primary education is free of charge in public schools." Then in Article 50 of the Constitution of 1961 stated that "The State takes measures for people in need of special education due to special circumstances to make them beneficial for the society. The provision of all kinds of conditions to ensure the best position of the gifted/talented individuals in need of special education is under state guarantee.", by this statement, the right to education of gifted and talented children has been taken under protection (Çetinkaya and Döner, 2012; Kili and Gözübüyük, 2000). Similarly, the right to education of these children continued to be preserved in Article 42 of the 1982 Constitution of the Republic of Turkey, "... The State takes measures for people in need of special education due to special circumstances to make them beneficial for the society. Education and training institutions only conduct activities related to education, teaching, research and investigation. These activities can not be prevented in any way." (Akyüz, 2008).

Convention on the Rights of the Child

Provisions related to child education are present in Articles 28, 29 and 30 of the first part of the "Convention on the Rights of the Child", which emphasizes the necessity of providing the minimum care to all children in the world. For example, in Article 29, paragraph 1, sub clause a, expressions such as "The development of child's personality, talents, mental and physical abilities as far as possible" are involved (Kepenekci, 2014). In this declaration, all children are mentioned about the benefits of good living, education, and for gifted/talented children the expression, "Gifted children must be brought to the widest means and opportunities of growth

with the help of the state and their families" is included (Çetinkaya, 1998; Turupcu and Gültekin Akduman, 2015).

Laws

The first regulation on gifted/talented students in the Republic period was the Law No. 1416, "Law on Students to be Sent to Foreign Countries" accepted on 8.4.1929. According to this law, an exam is being organized by the Ministry of National Education (Official Gazette, 1929:2) in order to determine students who differ in intelligence and other skills from other students to send students abroad at secondary and higher education level every year. According to this law, scholarships are given every year for high school graduates and those who have graduated from various branches of higher education by the Ministry of National Education and in order to provide education in the western countries by choosing those who want to study specializing in State or Economic State Organizations (MoNE, 2010a:13). This application has been expanded by the Law No. 4489 on "Law on Officers to be Sent to Foreign Countries", which was enacted in 1943 (Official Gazette, 1943:1).

Another legal regulation was the Law No. 5245, related to *"Delivery of Îdil Biret and Suna Kan to Music Collection of Foreign Countries"* prepared by the Minister of National Education Hasan Ali Yücel and published in July 12, 1948 (Ataman, 2014). With this law, education of Îdil Biret and Suna Kan in foreign country, who have achieved extraordinary success in the field of music, was regulated (Official Gazette, 1948:5).

Law No. 6660 issued in 1956, "Law on the Raising Children Displaying Extraordinary Ability in Fine Arts" expanded the content of application of the previous law. This law regulated the process of raising children who were extraordinarily talented in the fine arts in the name of the state both inside and outside the country (Official Gazette, 1956:1). Due to the fact that the mentioned law could not be implemented in time, a commission was established by the Ministry of National Education and Culture, and in 1976 the "Special Statute Regulation" was issued which allowed intensive education for special talented children in the State Conservatory. Thanks to this regulation, many people with superior ability in the field of music have been educated abroad (MoNE, 2010a).

Another law establishing the legal basis for gifted/talented students was the Law No. 222, "Primary Education and Education Law". In the 12th article of this law, the statement, "Children who are mentally, physically, spiritually, and socially disabled are provided with special education and training in case they are in the age of compulsory primary education" was included (Official Gazette, 1961:13).

Regulation on the subject has been made in the 2nd, 6th and 8th articles of the "National Education Basic Law" No. 1739. The common point of these articles was pointing out social aspects, proper guidance services and equal opportunity of education (Official Gazette, 1973:1). In Article 2, "Raising people having a balanced and proper personality that has developed physically, mentally, morally, spiritually and emotionally; having independent and scientific thinking power, having a wide world view, being respectful to human rights, giving value to personality and character, being responsible towards society, being constructive, creative and productive.", in Article 6 "People raised by various programs or schools to the extent and in the direction of their interests, abilities and skills during their education", and in Article 8, "Special measures are taken to educate children in need of protection and special education " phrases were included.

Another legal regulation was the Law No. 2916 on "Children in Need of Special Education". Article 8 of this law stated that "Official and private primary and secondary schools are obliged to provide special education services for children in need of special education in their own environment" (Official Gazette, 1983).

Statutory Decrees

"*Statutory Decree*" no. 573 was issued with the aim of regulating the principles of special education related to the disabled people and published in the Official Gazette on June 6, 1997. There were expressions on the 2nd, 4th, 7th and 8th Articles of this Decree (Official Gazette, 1997: 1-3).

The scope of special education services was stated in Article 2, and in Article 4, it was stated that education services would be presented in the direction of special education

principles such as the right to education, earliness, proximity, continuity, individuality, family participation, interdisciplinary approach, interaction with society. After emphasizing in Article 7 that pre-school education was mandatory for individuals with special needs and that the education process could be extended when necessary, in Article 8 the institutions which individuals in special needs can continue were stated.

Regulations

The first regulation that took measures for the education of gifted / talented children was the "*Regulation on Primary Education Institutions*" enacted in 1961. In sub clause d of Article 117 of this regulation, some measures were mentioned, "in order to take necessary precautions and to provide new opportunities for the students whose special ability was determined to receive support education related to these fields, and to enable these students to improve themselves in cooperation with organizations such as the centers of Science and Art, Public Education Centers, Special Education Institutions, State Theaters, Provincial Culture Directorate, Youth and Sports Provincial Directorate, District Board of Scouting, Anatolian Fine Arts High School" (Official Gazette, 1961).

The concept was discussed in the first part of General Provisions, of the "*Special Education Services Regulation*", which was jointly issued by the Ministry of State and the Ministry of National Education in 2006, and in the same regulation in the Article 4 sub clause ı, the support education room was defined as "Organized environment for the students who continue their education through inclusive educational practices and for the talented/gifted students to provide them supportive education services in the areas they need" (MoNE, 2006a).

In the second part of the regulation, the aims and basic principles of special education were specified. Accordingly, in Article 5 sub clause a, it was stated that "They should grow up as producers and happy citizens who fulfill their roles in the society, establish good relations with others, work collaboratively, adapt to their environment". Article 6 sub clause a stated that "All individuals in need of special education can benefit from special education services in line with their education and training needs, interests, abilities and qualifications "(MoNE, 2006a:28). In the 1st paragraph of Article 28, which contains the support education room which constitutes the subject of the third part of the same regulation, it was stated that "In the schools and institutions, for students in need with special education who continue their education in the same class with their peers who have no inadequacy, and for gifted/talented students, special tools and support education room will be provided as a special education support by providing education materials". In another regulation, statements relating to institutions opened for the education of gifted/talented individuals were included in paragraph 1 of Article 43. The stated expression was "Ministry of Education daytime special education institutions in order to ensure that the talented/gifted students of pre-primary, primary and secondary education period are aware of their individual abilities and use their capacities at the highest level by improving their capacities" and in sub clause b, it was "Social and emotional development is handled in unity "(MoNE, 2006a: 41).

In accordance with these regulations, in the 4th article of the Regulation on Pre-school and Primary Education Institutions in Turkey, support education room was defined as "The organized environment to provide supportive education services for children who are continuing their education through inclusive education applications and for gifted/talented children in areas they need.". The primary school was allowed to start one year early (60-66 months) under sub clause a, paragraph 6 of Article 11 of the same regulation. In addition, in the first paragraph of Article 32 of the same regulation, "Those who are above the grade level in terms of knowledge and skills of elementary school grade 1, 2 and 3 students are taken to the class upgrade examination within the first month of the education and training year with the recommendation of the class teacher and with family's written request. Successful students are upgraded to upper grade." phrase was stated. It is stated in the same paragraph that the test can only be done once for each child (Official Gazette, 2015). However, after the introduction of the 4 + 4 + 4 education system, classroom upgrade was limited to primary schools only, and this application was not applicable at secondary and high school level (Bakioğlu and Levent, 2013).

Directive

Various directives have been published with regard to the education and development of gifted and talented individuals as well as constitutional regulations. This subject was issued in "Science and Art Centers Directive (BİLSEM)" which was published in the communiques of February 2007/2593 in the Articles 1, 2, 4, 6, 7, 8, 9, 14, 21, 23, 24, 26, 28, 30, 36, and 43. and in the sub-clauses.

For example, Article 1 states that "The aim of this directive is to ensure the awareness of gifted/ talented children/students in the pre-school, primary and secondary period about their individual abilities, providing their use of capacities at the highest level by improving their capacities and by this way, to organize the procedures and principles regarding the establishment and operation of the centers of science and arts which are opened and educated by the choice of teachers ". The content of this directive is defined as "The Directive covers the establishment, procedures and principles of science and art centers opened for the purpose of education and training of gifted/talented children/students affiliated to the Ministry of National Education". In Article 4 sub clause j , gifted/talented child/student was defined. In this directive, the formation, objectives and principles of Science and Art Centers, diagnosis and placement as well as teaching-learning and practical subjects were involved (MoNE, 2007). In addition to this, students are currently being elected to the BİLSEM through the Directive on Science and Art Centers (Levent, 2014).

In order to prevent adverse situations that may arise in the absence of an appropriate orientation to children in need of special education, the importance of the need for guidance and psychological counseling services was emphasized in the Article 10 sub clause i, published in 2003 with number 2552, "Guidance in Primary Education Directive". In order to draw under this importance, the following statements were given; "The Guidance and Psychological Counseling Service in the school, or otherwise affiliated with the Guidance Research Center, is cooperated to ensure that the gifted students and the students with special education need to be identified and directed in a proper way.".

Five-Year Development Plans

In Turkey, since 1963, development plans covering five years have been prepared considering total investments, total expenditures, demand situation in the country and saving tendencies in order for the country to show a planned growth. In these development plans, plans were also made for the education of gifted/talented children.

In the First Five-Year Development Plan, it was decided to create an education system that would distribute the citizens in various tasks according to their abilities, to provide scholarship to the students who are in need, and to make talented students benefit from all the educational opportunities regardless of their circumstances (SPA, 1963:449). In the Third Five-Year Development Plan, the decision has been taken on the application of an examination threshold in the transition to higher education and the reorganization of the examination system so that higher gifted/talented individuals can continue the higher education in the areas that they are capable of (SPA, 1973:751). In the Fifth Five-Year Development Plan, it was stated that necessary precautions should be taken for education of all children in need of special education and gifted/talented individuals, and necessary precautions should be taken to educate the teachers and staff to work in the field of special education. In addition, it has also been decided that special education services to be provided to gifted/talented children should be carried out within a program (SPA, 1979:157).

In the Sixth Five-Year Development Plan, it was decided that it was necessary to develop the infrastructure for education of all gifted and talented children along with all children with special needs, to reconsider and direct the free boarding and scholarship system to gifted/talented students with insufficient financial resources, and to educate these students as a scientist by making basic sciences desirable for them (SPA, 1990:294). In the Seventh Five-Year Development Plan, giving importance to the development of teachers and faculty members in terms of number and quality, developing the educational institutions for the education of gifted/talented and successful students and supporting the private sector initiatives in these fields were decided (SPA, 1996:41). In the Eighth Five-Year Development Plan, it was

decided that the focus should be on inclusive education to ensure the flexibility of space, equipment, staff and programs to meet the needs of all children with special needs, and to provide guidance and counseling services for gifted and talented children in preschool and elementary school period, to prepare appropriate environment for the education of these children and to support initiations of private sector on this field (SPA, 2001:95), while in the Ninth Five-Year Development Plan, in addition to the decisions made in the previous development plan, the emphasis was placed on expanding the educational opportunities for qualified human power generation (SPA, 2007:6). In the 10th Five-Year Development Plan, which was the last development plan, it has been decided that the level of education and the quality of the labor force is a decisive factor in the labor movements with the emphasis on the increasingly qualified human power and that knowledge, communication technologies and education with intensive inter-cultural interactions will be multi-dimensionally enriched (SPA, 2012).

Council Decisions

In addition to the Development Plans, starting from 1921, issues related to the education of the gifted/talented children were discussed in the National Education Councils where the problems of the Turkish education system and the proposals regarding to their solutions were evaluated and the recommendations were taken. One of the decisions taken in the first Council stated in the book titled "National Education Councils (1995)" was "A ministry project on public schools was discussed. In this project, it has been stated that there is a need to prepare programs in order to educate children with a capability that can be successful in life. "(Cited by Sarıhan, 2009:104).

Firstly, the education of gifted/ talented children was mentioned in the 11th National Education Council in 1982. In this council, special education specialists were mentioned, whereas the education of gifted/talented individuals was also referred to as a special education field (MoNE, 1982:21). In 12th Council, again, it was recommended that education for gifted/talented children should be emphasized, special classes for children with high intelligence level should be opened, and programs for the education of gifted/talented children in science high schools should be included (MoNE, 1988:4). In addition, in 17th National Education Council, education of gifted/talented children were focused most. As a result of this council, the decisions;

- Making policies on education and employment of gifted children (Article 17);
- The education of these children being provided by teachers who have completed certificate programs for universities (Article 18);
- Recognizing the course credits of the activities and projects to be made in BİLSEM as school course credits (Article 19);
- Student acceptance to Anatolian Fine Arts High School and Sports High School and similar secondary education institutions with two-stage ability-based examination (Article 20);
- Opening institutions such as medallion schools, research units for these students that will be the attraction center, etc. The provide financial support to the families of students who will be going to these institutions (Article 21);
- Transitioning from a student-centered classroom system to a lecture-focused classroom system in primary and secondary education institutions' 6-12. grades and providing the opportunity for gifted and talented children to progress at their own pace (Article 22);
- Removal of prohibitive provisions on the entry of disabled students with special abilities into upper education institutions (Article 23);
- Selecting teachers for BİLSEM with similar criteria used in the selection of teachers to be employed in Science high schools and Anatolian high schools (Article 24) and
- Being in a cooperation with TÜBİTAK, the Ministry of National Education and the universities in the organization of summer and winter camps, science counseling and similar activities on education of gifted/talented students (Article 25) were taken (Ataman, 2014:16-17, MoNE, 2006b).

In the 18th National Education Council, decisions have been taken more indirectly concerning gifted/talented children. A few of these were related to the increasement of awareness of family and teachers in order guideline services to be carried out well, the effective use of different psychological measurement tools to guide orientation, and the monitoring of student performance in

student orientation. In addition, the importance of developing valid and reliable diagnostic tools for the identification and detection of gifted/talented children has been addressed (MoNE, 2010b). The last National Education Council, 19th Council was held in 2014. As a result of this council, the proposals about the regulation of children's ability development from the pre-school period, the preparation of a regulation for the education of the talented/gifted students at high school level and the implementation of a new teaching program as valid from the kindergarten have been adopted (MoNE, 2014).

Educational Practices

It is not possible to not mention the "Palace Schools", one of the first educational facilities offered to gifted/talented children in history, while addressing the educational practices offered to them in Turkey. The Palace School, which was active during the Ottoman Empire, was the first educational institution in the world to systematically apply gifted/talented education. The Palace school can be considered as a school in palace where firstly the princes and talented slaves were educated from the time of Yıldırım Beyazıt II until the time of Murat II. Fatih the Conqueror has enlarged this school and restructured it to become a superior educational institution to educate the state servants (Enç, 1979; Enç, Çağlar and Özsoy, 1975; Güven, 2012; Kırpık, Ünal, Işık, Demirtaş, Tokdemir, Birbudak and Akyol, 2016).

The most elite of those who studied at Palace Schools had been assigned to important positions such as "Vizier, Grand Vizier, Governor, Chief Admiral". Many of the famous diplomats and commanders who passed through during Ottoman history grew up from this school with distinguished artisans, poets, and musicians (Akkutay, 1984; Akyüz, 2008). However, with the decline of the Ottoman Empire, the nature of the education in these schools began to move away from its purpose and the school was closed down by 1909. However, the Palace School system has been a source of inspiration for European educators and many countries have developed educational policies for gifted/talented individuals by taking advantage of this model. In this study, educational practices oriented towards the gifted and talented individuals were handled chronologically in the Republic of Turkey established after demolition of Ottoman Empire, the developments in the historical process were evaluated from various angles in discussion and conclusion section.

In the first years after the establishment of the Republic of Turkey, the country was in poverty and the literacy rate was very low, it was more and more necessary to take measures to solve these problems. However, shortly afterwards, the problem of lack of educated staff in modern education areas began to develop. In line with this need, 700 students with inadequate financial status had been sent to universities in America and European countries to study at various levels in higher education by Atatürk. They also served as senior executives in state-owned institutions when their training was completed and returned to the home country. These students were Remziye Hisar, Sabahattin Ali, İhsan Ketin, Cahit Arf and many others who had superior successes in their fields. In 1929, Law No. 1416 on "Education Abroad" was enacted and applications for successful students to receive education abroad were made more regular (Ataman, 2014).

In 1961, a protocol was signed between the Ford Foundation and MoNE on the establishment of Science High School. In 1964, the first Science High School in Ankara was established and a special education was offered to children who showed outstanding achievement in mathematics and science. Ankara Science High School, which gave its first graduates in 1964, collected gifted/talented students in science and mathematics and teachers were educated with the financial support of Ford Foundation. Teachers were specially selected by the support of United States, Bronx and Science High School in New York and received special training with the teachers trained in the United States and in the Middle East Technical University. This implementation, supported by labs, books, trips, observations, discussions, small group works, and individual support practices in the boarding school environment, lasted for four years and began to lose its trait with the end of the support of the Ford Foundation. Currently more than 25.000 students attend the science high schools in 232 schools which are continuing to provide education (MoNE, 2015).

In 1991, the First Special Education Council was organized by the Ministry of Education, gifted/talented children were also focused in this council, while there were no significant studies on gifted/talented children until 1990s. As a result of the council, the committee which also included faculty members who studied the relevant subjects has prepared a report about the definition, distinctive features of the gifted/talented children, the model drafting, diagnosis and selection, training programs and the application of these programs, employment, characteristics of educational environments for these children, current situation and problems in Turkey (MoNE, 1991a). In the same year, Yeni Ufuklar College was established and conducted studies on the education of the gifted/talented children in the primary school period. In this school, the importance of this issue in our country by maintaining connections with people related to foreign institutions had been tried to emphasized but the school was closed at the beginning of 2000s (Davaslıgil, 2004).

Again in 1991, İnanç Foundation was established in order to educate the gifted and talented children with limited financial resources under the leadership of businessmen Sezai Türkeş and Fevzi Akkaya and in 1993, Private İnanç High school started to provide boarding education with 300 students. This school, which served to secondary school and high school children continued to provide only high school education due to the fact that eight years of compulsory education was introduced in 1997. In 2002, the foundation was transferred to the Turkish Education Foundation because of financial impossibilities. Since 2002, it has been continuing to provide education in the name of Turkish Education Foundation İnanç Türkeş Private High School. In this high school, a program which is a combination of various teaching theories developed for special children at high school level is being conducted (Ataman, 2014; MoNE, 2010a).

Science and Art Councils (BILSEM), founded in 1995 are resource centers where gifted and talented students in pre-school, primary and secondary school age are educated in relation to their interests and abilities in times outside formal education. Science and Art Centers, which are the most prevalent institutions that provide education to the gifted/talented students in Turkey, have been planned to provide services to the gifted /talented students with the prepared program. Intelligence tests are applied to the BİLSEM students and students who get over 130 points in intellectual capacity are accepted. There are 83 BİLSEM in 70 cities in Turkey. In practice, BİLSEMs try to improve the students' well-being through enrichment of program and by integrating activities that will enable to consider students entirely as well as to develop emotional and social aspects with a curriculum (Özbay, 2013). However, although it is mentioned in the Directive of Science Art Centers, it is still not possible to start such an application for preschool children. BİLSEMs are currently accepting students starting from primary school students. However, in order for BILSEMs to be the center of research, experimentation, observations and applications mainly by 2016, new strategies will be passed on by Ministry of National Education; in order to improve the quality of the education in BİLSEMs, it was stated that workshops were organized with teachers, academicians and stakeholders, and event guides were prepared separately for each program (http://www.meb.gov.tr/ozel-yetenekli-ogrenciler-icin-yeni-stratejiler-hazirlandi/haber/9893/tr).

In 2002, for the first time in Turkey, in Istanbul University Hasan Ali Yücel Education Faculty and in 2010 in Maltepe University and then in Istanbul Aydin University, Biruni University and Sebahattin Zaim University, "Teaching of Gifted Children" undergraduate program was opened for the education of gifted/talented students. Anadolu University Education Faculty, Department of Special Education, the Division of Education of Gifted Children was also established and only the graduate level education is given here. In addition, educational and research centers have been established in Hacettepe, İnönü, Malatya, Kastamonu, Karabük, İstanbul Bilgi, Anadolu and Trakya Universities for the education of gifted and talented children. However, it is seen that Istanbul Medeniyet University has formed a Training Village for talented children by working together with Tuzla Municipality and that Sebahattin Zaim University is educating teachers about the education of gifted/talented children.

When examining the practices in our country in terms of pre-school education

level, the applications made by Özel Petek Children's House in Istanbul are in the forefront. The Petek Children's House is a kindergarten where the gifted/talented ones are being diagnosed and provided accelerated and enriched experiences compared to the age groups. Furthermore, this school carries out special education programs with the parents of these children. The school, which receives information and experience support from various foreign organizations such as NAGE in the UK, also contributes to the efforts in our country by organizing scientific meetings and panels related to the subject (Akarsu, 2001).

In 2002, a study was initiated in Beyazit Ford Otosan Elementary School, which was conducted between MoNE and Istanbul University Hasan Ali Yücel Faculty of Education, in which a differentiated education program consisting of children with gifted/talented half of the class was developed. The aim was to educate gifted/talented children in terms of their talents, interests and capacities they need without leaving their normal peers (MoNE, 2010). This application ended with the adoption of Law No. 6287 on the 4 +4 + 4 education system, "Law on Primary Education and Education Law and Amendments in Some Laws" (Küçükoğlu, 2014).

Between 2007 and 2010, a group of academicians in Bursa conducted a project called "Identification and Education of the Gifted Children in Pre-school Age" in a private kindergarten. In the project, a model was adopted that offered a combination of enriched educational opportunities where highly talented children between the ages of 4 and 6 coexisted with their normal peers and at the same time had the opportunity to develop their skills and knowledge (Özbay et al., 2009). However, this application ended in 2011.

In addition, considering the preschool period, it is seen that the practices of inclusive education have come into prominence in recent years. In the Pre-School Education Program updated by the MoNE in 2013, it was explained how to adapt the activities according to the children in special needs in order to inform the teachers about inclusive education and facilitate the teaching practices. However, especially from the point of view of gifted/talented children, it has been observed that there were problems due to the graduation of teachers without knowledge and practice about diagnosis of these children (MoNE, 2013).

Another application is the Training Program of the Talented Professionals realized with the support of AAAS by the Head of Department of Education of the Gifted Ones of Anadolu University in the 2007-2008 education-training period. In this project, gifted and talented students in grades 6 and 7 are presented with an educational and social environment in which they discover their abilities, improve themselves and continue outside of the normal education-training process. In the program, gifted students are taught on weekends and summer terms using mathematics and science-based enrichment and acceleration strategies (Sak, 2009). It can be said that in addition to Anatolian fine arts schools, some of private schools which use highly selective and skeptical model and do not serve in direction of private education purposes, such as Robert College, Izmir American College, German and Austrian High School give education not only to students selected according to their success but also to a group of students who have special talents. However, especially in public schools, it is observed that especially the Anatolian high schools were spread out in an unplanned manner similar to the science high schools, and consequently the majority of their qualifications were decreased compared to the time they were first opened (Bakioğlu and Levent, 2013; Dağlıoğlu, 2015).

In 2009, with the collaboration of the Ministry of National Education and AAAS, it was started to work on establishing a strategy paper on the development of systems and activities related to the training of gifted/talented people. Regarding this, a workshop was held in 2009 aimed at evaluating the science and arts centers, determining the current situation, making comparisons with the world examples, and putting the applicability of the examples in line with the views of stakeholders in this context. In addition, at the 19th meeting of the Supreme Council for Science and Technology in 2009, the "Talented Individuals Strategy and Implementation Plan 2009-2013" was prepared in order to improve the education of the gifted/talented individuals in Turkey, and then the 2013-2017 plan was prepared (AAAS, 2013). In addition,

AAAS provides awards to schools and students who succeed the project competition in the field of mathematics between primary school age students and provides services to 8-12 and 14-17 age groups by establishing the Academy of Gifted Students.
http://www.bursabilimmerkezi.org/sayfa/tubitak-ustun-zekalilar-ve-yetenekliler-akademisi/61.htm). AAAS gives prizes to secondary school students who get a degree in secondary schools and high schools mathematics competitions, inter-high schools mathematics and biology competitions and project competitions between high school and university students, makes the rules for international mathematics and science olympics, creates Turkish team and prepares students for competitions, provides scholarships abroad for the purpose educating scientists (TGNA, 2012). Government Free-Boarding and Scholarships, which have been carried out since the foundation of the Republic, and assistance to students attending secondary and high school are also provided for the economic support of gifted/talented students.

In the 2013-2014 academic year, the Turkish Gifted and Talented Foundation established a school in Ankara with a differentiated and enriched program for the education of gifted / talented children, covering an age group from pre-school to secondary school (http://www.tuzyeksav.org.tr/). In addition, it is observed that private schools such as Tekden Schools, Doğa College and Bahçeşehir College have implemented programs to educate gifted/talented children within themselves.

In the Grand National Assembly of Turkey (TGNA), in November 2012, a research commission was established with the justification that is *''The gifted and talented children are the greatest source of wealth in a country. Because they are the ones who will play the most important role in shaping the future of the country if they receive appropriate and adequate education. The policy of detection, education and monitoring of these children should be clearly defined and institutionalized and a continuing structure should be established.*" in order to find out the gifted and talented children, to find out the problems related to their education and to provide effective employment that will contribute to the development of country. As a result of the sub-commissioning studies, a comprehensive report on the education of the gifted and talented children in Turkey, the problems and the solution proposal was prepared by examining the applications for the education of gifted/talented children in other countries (TGNA, 2012).

Three national and several international congresses and symposiums were held in our country, first one in 2004, regarding the education of gifted/talented children. The 4th national congress on the education of gifted/talented children will be organized in Hasan Kalyoncu University in Gaziantep in March 2017.

In Turkey, today, it is seen that over thirty civil society organizations such as the Turkish Foundation for the Education of the Gifted and Talented Children, the Federation of the Gifted Education, the Association of the Gifted and Talented Children, the Academic Association of the Gifted Children, the Tekden Association of the Education of the Gifted and Talented Children, the Foundation of Gifted Children have been established. Teachers, families, academicians and other interested people will come together to educate these children with a more organized approach for the education of gifted and talented children aimed at these non governmental organizations.
(http://www.tacved.org/ustun-yetenekliler-icin-dernekler-vakiflar). The Federation of Higher Education of the Talented (FHET), on the other hand, aims to gather the associations supporting the education of the gifted and talented under a single roof, to exchange information on professional issues, to develop the relations with the private and official organizations that the members are interested in, to create ideas in cultural and social issues, lobbying activities, enlightening the public by making scientific researches on various issues included in FHET field of activity, and making the members and the country benefit from them by developing cooperation with similar national and international institutions (TGNA, 2012).

One of the important developments in this area is the Institute of Giftedness, which has been operating in Istanbul since 2000s. Since the day it was established, the institution has been educationg and providing corporate consultancy services for gifted/talented children, their families and teachers. However, it seems that many cen-

ters such as Necate Baykok Gifted and Talented Institute, the Children's Foundation have been established to identify and educate the gifted/talented children. Turkish Gifted and Talented Journal (TGTJ), Young Scientist Education and Giftedness Journal and Education of Gifted Children and Creativity Journal (GCCJ) are three well-known journals about gifted/talented children in Turkey.

In addition to all these applications, some municipalities seem to have produced projects in this area, especially by working with development agencies in the regions. For example, it is seen that Bağcılar Bayrampaşa and Ümraniye Municipalities in Istanbul have a cooperation with the Istanbul Development Agency. There is also a project on the education of talented children who are supported by the Kahramanmaraş Elbistan Governorship and the Provincial National Education Directorate and the Eastern Mediterranean Development Agency.

Conclusion and Recommendations

When it comes to the definition of giftedness/talentedness, it is still seen that its scope is highly discussed and a wide variety of definitions are emphasized. It can be argued that this is because of scientists working on both the historical process and the gifted/talented person, and defining giftedness/intelligence according to their own viewpoints. However, when it comes to the generally accepted definitions in Turkey, students' differences from their peers and the ability over average are the common points of all definitions.

Gifted and talented individuals appear to have begun to be educated historically for the first time in the Ottoman Empire with the application of Palace Schools. In the Republican period, it has been emphasized that more and more gifted/talented individuals have been given more importance over the years. Therefore, it can be said that educational opportunities for gifted/talented children and different possibilities are increasing gradually.

In Turkey, when the national legislation, the statutory decrees, the regulations, directives and decisions were examined it is seen that there are articles that define and support the education of the gifted/talented children. Some advantages are provided including early start and promoting, that is, acceleration strategy. However, it is seen that different approaches such as course credit, credit completion are overlooked. In addition, in relation to the giftedness/talentedness, in primary and secondary education legislations, applications such as enrichment, differentiation, and support room are allowed but it is seen that the education of the gifted/talented children is tried to be carried out with the BİLSEM model, commonly. These students need their own programs so that they do not have normal learning speed and features. It is clear that applications such as BILSEMs, which requires to use out of school time, will not be enough for these programs. However, in order to meet the educational needs of gifted and talented children, a sub-commission was created in the Turkish Grand National Assembly and the issue was examined in detail. AAAS's academic, financial and moral support was provided to improve the abilities of these children, and strategic plans have been prepared.

From the 1990s, gifted/talented children are beginning to be discussed and on the agenda topics in many areas in Turkey. In this regard, it is observed that the education of gifted and talented children is being discussed in detail in the universities and the Ministry of National Education, and efforts are being made to implement new programs for gifted/talented children by conducting various workshops and congresses. In parallel with the increasing awareness in the society in 2000s, it seems that institutions and centers related to the education of especially the gifted/talented children are beginning to be established, along with the pace of their work with the foundations and associations established by the parents of the children, in the public-local administrators, universities and non-governmental organizations. However, despite all the above-mentioned studies, it seems that there are various problems in the education of the gifted/talented children and the support of the special areas.

In order to solve the problems of gifted/talented children in Turkey, it is first necessary to establish a government policy on education of gifted/talented children. However, from the beginning of the Republican period, it has been observed that various training programs for the education of gifted/talent children have been implemented but have been abolished without evaluating

the results. Stability and sustainability are extremely important in the education of gifted/talented children, as in the general education systems. Gifted and talented children will be able to access the education they need if the necessary programs are monitored and evaluated and necessary arrangements are made.

Raising awareness of families and society is the most important problem in the identification and education of gifted/talented children. For gifted/talented children, the government has to provide a whole range of services, which takes into account the health, nutrition and education of the child which are the fundamental philosophy of the early childhood approach as a whole and takes the potential to the maximum level, taking into account the principles of early identification and early education.

Especially in Turkey, it is seen that gifted/talented children have a broad right in the legal sense. However, it is also a fact that the use of these rights is very problematic. It should be noted that all kinds of measures should be taken for the children who are determined to be gifted/talented in the pre-school period, supportive education rooms should be established. It is seen that there are regulations about the science art centers to provide education for pre-school children, however it seems that there are no sufficient practices. In this regard, especially considering the diversity of the gifted/talented children's characteristics, programs should be included in different educational programs as much as possible and should be expanded after pilot studies and necessary evaluations should be made. The necessity of diversification of education models and programs that will be prepared is very important because the skills and knowledge of children gradually grow and separate from their peers in the secondary and high school period. Supportive measures for children's skills, interests and abilities such as taking an active role in projects planned and implemented by separate schools, boarding schools, resource centers, governmental or private institutions, etc., should be taken by taking into account the breadth of the area of interest of children.

The strategic plan prepared in 2009 and 2013 in cooperation with the Ministry of National Education and AAAS was an extremely important development. However, it is unfortunately not possible to say that much has been done about the actions to be taken in this short, medium and long term. One of the important actions emphasized in these documents is the development of education models starting from the pre-school period to include higher education and later or adaptation of the models applied in other countries. At this point, it is seen that the current characteristics of Anatolian and science high schools are incompatible with those of their establishment and highly in erosion in terms of educational quality, and student and teacher characteristics due to the fact that they were spread rapidly. In these schools, it is necessary to make improvements especially for the election and education of the gifted children.

One of the elements that have indispensable importance in the education of gifted/talented children is the teachers who will educate these children. In Turkey, as mentioned above, departments were established in some universities, some of them provide only undergraduate education, while only one of them provides postgraduate education. It is seen that these departments started produce graduates after 2000 but the Ministry of Education assigned these teachers as a "class teacher" and did not open a separate teaching field as "gifted/talented teaching". When the studies conducted in other countries were examined, it is seen that the teachers who have graduated from various teaching areas have gained the right of teaching this area by participating in certificate programs on the education of gifted/talented children in accordance with certain criteria. It would be more appropriate for Turkey that needs to use its resources efficiently, to educate teachers who have graduated from various teaching fields and who have specific experience and certain special criteria, with certificate programs administered by field specialist academics instead of opening undergraduate programs. However, in order to provide the education that gifted/talented children need in different educational stages, it will be useful to spread the postgraduate education programs in universities provide opportunities for teachers and the researchers in order to train themselves in this field.

As a result, individuals who do not have the education and employment opportunities appropriate to their interests, abilities

and skills are going to other countries offering these opportunities. Therefore, we are confronted with "brain drain" if we do not offer appropriate training opportunities for gifted/talented individuals and if we do not provide job opportunities afterwards. This situation is a great loss both in terms of the value given to the people in the society as well as being one of the biggest defeats in the development and progress of the country.

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Father Involvement, Early Intervention Program and Well-being of Children with Special Needs

Abstract

The scenario of the issues that father involvement, early intervention program and well-being of children with special needs have led to be studied. Therefore, this study was to examine whether the three factors or constructs or variables has direct, indirect and intermediary relationship (mediator) using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 3.2.3 software. 158 samples of fathers who have children with special needs aged 4 to 8 years have answered the questionnaires for survey research. In addition, the results of this study prove that measures seven item in three constructs is significant and is suitable for Well-being of Children with Special Needs (Child Health, and Child Housing and Environment); Early Intervention Program (Individual Family Service Plan, and Screening); and Father Involvement (Process Thought, Shared Interest, and Time). In conclusion, this research has proved Early Intervention Program as a Mediator, development a Model of Father Involvement in Early Intervention Program for Well-being of Children with Special Needs and the further study in future is scrutinized with emphasis an Early Screening.

Keywords: Father involvement, early intervention program, well-being of children with special needs, pls-sem

Introduction

The scenario of the issues that involve the father involvement, early intervention program and well-being of children with special needs have led the father involvement in early intervention program for the well-being of children with special needs to be studied by the researcher with some principles that can support it.

Based on Ecological Theory (Bronfenbrenner, 1979, 1986, 1989); Identity Theory (Erikson, 1968) and the Human Needs Theory (Maslow, 1943, 1998), some key points related to the theoretical framework of this study (Figure 1).

Microsystem in the ecological theory posits that the involvement of more than two parties involved in a place like living at home and canteens in schools can affect each other (Steinberg & Bornstein, 2011). Therefore, the researcher was hypothesized that based on the ecological theory father involvement has a positive impact on the early intervention program.

Ecological theory linking microsystem also where some aspects of microsystem the most important in a child's life are family, school (care environment) or day care setting and peer or older child (Steinberg & Bornstein, 2011). In addition, the children spent the longest time, including in large families, in early care and education programs, health care settings and community sites such as neighbourhoods, libraries and playgrounds (Eastman, 2004). The number and quality of relationships the family and education program where a child spends time also has important implications for development (Eastman, 2004). Therefore, the researcher hypothesized that in the ecological theory the early intervention program has a positive effect on well-being of children with special needs.

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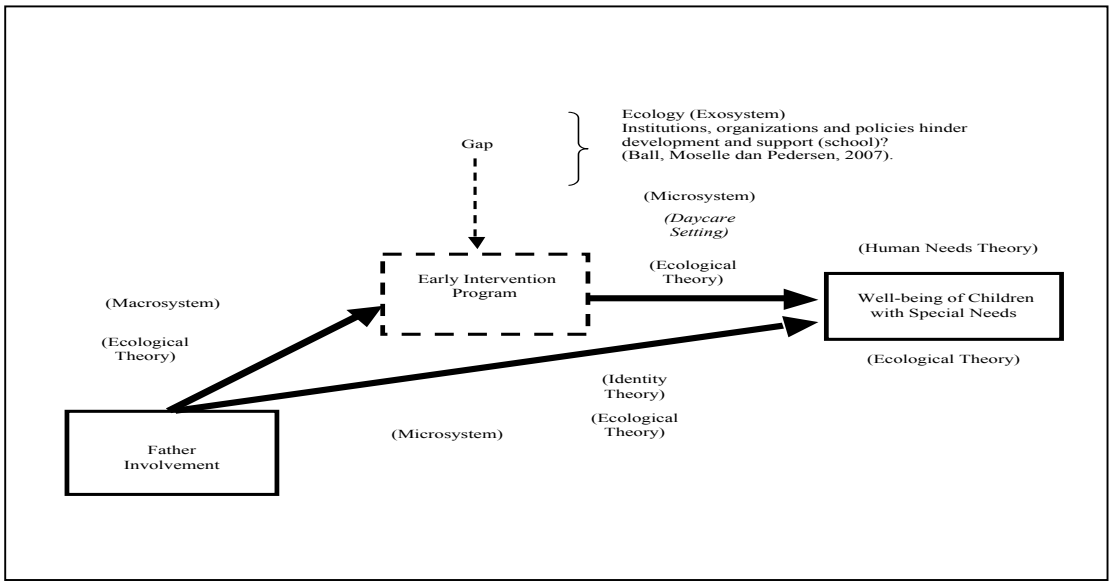

Figure 1.
The theoretical framework of the study.

Ecological theory states that in microsystem available ecological well-being is a concept in which the well-being of the child is determined by the level of parents, families, communities and social well-being (Prilleltensky & Nelson, 2000). The father involvement is part of the children microsystem (Ball, Moselle & Pedersen, 2007), and the view of the role of fatherhood and family and cultural interaction through cultural. Besides, macrosystem also affect how involved fathers affect children and families. Children interact with other people, including families (Steinberg & Bornstein, 2011) and are influenced by parents (Steinberg & Bornstein, 2011). Identity theory states that the identity can refer to the definition of the individual, including "I'm the father of two sons" (Schwartz, Luyckx & Vignoles, 2011) and acts as interpersonal between groups and interaction as well as social recognition or otherwise that it received from other individuals or group (Butler, 1990; Reicher, 2000). Therefore, the researcher hypothesized that the father involvement in ecological theory (Ball, Moselle & Pedersen, 2007; Steinberg & Bornstein, 2011) has a positive correlation with the well-being of children with special needs (Prilleltensky & Nelson, 2000). The father involvement and well-being of children with special need also has a relationship in identity theory.

Exosystem in ecological theory also clearly states that the institutions, organizations, and policies to hinder or promote development and support (Ball, Moselle & Pedersen, 2007). However, previous studies have shown that support in the form of the early intervention program does not preclude the father involvement and well-being of children with special needs. Father involvement and early intervention program are to achieve the final objective of the well-being of children with special needs (Human Needs Theory). Everything a person needs, including children without any conditions to be fulfilled by placing equal rights. Human needs theory applies to adults as well as children with special needs and helping father in a variety of needs and priorities in understanding the ways in which fathers need to support their children's development (Davis, 1992). All these requirements can be found in the Model of Children Needs (Davis, 1992), modified from Maslow (1943).

It is clear that the ecological theory, identity theory and theory of human needs play an important role in forming theoretical studies in this review. Relations between these theories can be seen as a hypothesis in relation father involvement and early intervention program (ecological theory), early intervention program and well-being of children with special needs (ecological theory and human needs theory), and father involvement and well-being of children with special needs (ecological theory, identity theory, and human needs theory) as well early intervention program as study of gap through father involvement -> early intervention program -> well-being of children with special needs which is considered as an intermediary for the study.

Therefore, the general objective of this study was to examine whether the three factors or constructs or variables, namely father involvement, early intervention program and well-being of children with special needs has direct, indirect and intermediary relationship (mediator). Based on the general objectives, four (4) specific objectives of the study were determined, namely: (a) to identify the influence of father involvement against early intervention program, (b) to identify the influence of the early intervention program against the well-being of children with special needs, (c) to identify the influence of father involvement against the well-being of children with special needs, and (d) to identify early intervention program as an intermediary relationship (mediator) between father involvement and well-being of children with special needs.

Method

The research methodology was adapted from Systematic Implementation Procedures PLS-SEM by Hair et al. (2014) composed of six stages, namely (1). Structural Model Designation, (2). Determination of Measurement Model, (3). Data Collection and Assessment, (4). PLS Path Model Estimation, (5). PLS-SEM Evaluation Results, and (6). PLS-SEM Evaluation Results Structural Model.

Inferential statistics using multivariate analysis Structural Equation Modelling (SEM), better known as PLS-SEM via software SmartPLS 3 (Part B-D in the questionnaire). SEM data analysis is a complex statistical technique popular nowadays in the studies of Social Sciences (Hair et al., 2010). It combines the ability to analyze various statistical analyses such as factor analysis, multiple regression and path analysis simultaneously. Path Analysis contained in SmartPLS 3 software is used to examine the relationship between the independent variables and the dependent variable to answer the research question and achieve the objectives. The data in this study to measurement will be analyzed using SmartPLS 3 software (Ringle et al., 2005).

Population, Sample and Sampling

The population is observed on a group of fathers who are involved in the early intervention program. The client data of Special Education Services Center (3PK) as of 30 July 2015 in Malaysia shows that there is a population of 933 fathers who have children with special needs involved in the early intervention program at the Special Education Services Center (3PK) Ministry of Education, Malaysia.

Proposed Sample Size in PLS-SEM (Hair et al., 2014) clarified that needs minimal sample size required to detect the minimum R^2 (0.10, 0.25, 0.50 and 0.75) in any construct internal Structural Model for the interests of 1%, 5% and 10% consider the level used in Statistical Power of 80% and a certain level of complexity path model PLS (the maximum number of arrows independent variables towards the dependent variable in the build path model PLS). For example, when the maximum number of arrows independent variables in the measurement model (independent variables) to the Structural Model (the dependent variable) is five, one would need either of them 70 observations for the Power of Statistics of 80% to detect the R^2 at least 0.25 (with a 5% probability of error).

The study also found based on the conceptual framework, the number of independent variables to the dependent variable in the measurement model and structural model is two, each of which requires either of which 158 observation to achieve "statistical power of 80% for detecting R^2 values of at ≥ least 0.10 (with a 1% probability of error).

Most researchers use sampling error of 5% (significance level $\alpha = 0.05$) with a 95% level of confidence. In addition, as a researcher it is also necessary to establish a level of significance of our study we tested the hypothesis for our study. Significant level commonly prescribed in Social Science research is $p < 0.05$ (alpha value α) in addition there are researchers who set the alpha level at 0.001 significant with a 99% confidence level. Normally also to determine the sample size, researchers can refer Table Sample Size Determination by Krejcie and Morgan (1970) and Cohen et al., (1988). However Krejcie and Morgan (1970) did not discuss directly about the significant level and sampling error compared to Cohen (1988).

Therefore, in this study the researcher have selected 158 samples and adapting the proposed sample size in PLS-SEM for Statistic Power of 80% (Hair et al., 2014) based on the maximum number of arrows to construct a

total of two requiring 158 size sample and fix this study is the significant level $p < 0.05$ (5% error) with a confidence level of 95%.

Thus, the sample for this study consisted of 158 fathers of children with special needs aged 4 to 8 years is a limitation of the study involved in the early intervention program in 13 Special Education Services Center (3PK), Division of Special Education, Ministry of Education in entire Malaysia.

Sampling is a research strategy when researchers can obtain information of a population of some individuals or groups who sits on the population (Mohd. Majid, 2009). The main principles that should be observed in the sampling are to obtain a sample that is representative of the population studied. Therefore, in this study the researchers chose a simple random sampling. Simple Random Sampling is the process of taking or using samples when every individual in the population has an equal chance to be selected. Therefore, based on the full list of the individual or the sampling frame for the population under study took a sample of 158 fathers who are characterized by uniform involved in early intervention program has children aged 4 to 8 years.

Researcher found also that aspect that needs attention is the truth involves sampling survey samples meet the characteristics of the study population and of all individuals who have a specific feature or some special features (Noraini, 2013).

Based on data from fathers who have children with special needs, the researcher with the approval of each 3PK officer and father found there were 158 fathers answered a questionnaire study of simple random sampling (Table 1). 158 samples of the fathers was made up of fathers who have children with special needs under 4 years around 21 fathers because the concept of early intervention program is for children with special needs under 4 years including taking 107 fathers who have children with special aged 5 to 6 years and 30 fathers who have children with special needs aged 7 years to 8 years. The selection of a sample of 158 fathers was based on the presence of fathers with their children with special needs active for at least three months, which are also the limitations of these studies.

Table 1.

Simple random sampling of 158 fathers with children with special needs in 13 Special Education Services Centre (3PK) all state in Malaysia.

States	Child Age (Years) / Simple Random Sampling Father Who Have Children With Special Needs				Total
	4	5	6	7-8	
Putrajaya	1-20 (21)		21-69 (48)		69
Perlis		70-77 (8)		78-79 (2)	10
Kedah			80-90 (11)	91-92 (2)	13
Pulau Pinang				93-96 (4)	4
Perak			97-102 (6)	103 (1)	7
Selangor			104-111 (8)	112-114 (3)	11
Melaka		115 (1)	116-120 (5)	121-123 (3)	9
Johor			124-125 (2)	126-128 (3)	5
Pahang			129-134 (6)	135 (1)	7
Terengganu			136-137 (2)	138-140 (3)	5
Kelantan			141-143 (3)	144-145 (2)	5
Sarawak		146-147 (2)	148-150 (3)	151-153 (3)	8
Sabah			154-155 (2)	156-158 (3)	5
					158

The number of samples to pre-test and pilot studies each of 30 fathers who have children with special needs aged 9 years and above were taken from a total of 933 fathers except sample the real total of 158 fathers elected to have children with special needs aged 4 years to 8 years.

Survey Research

Pre Test and Pilot Test. Pre Testing is typically done to measure the extent of the changes that will occur on the dependent variable processed later due to the independent variable (Mohd Majid, 2009). Pratt (1980) explains that the concept of reliability measurement in quantitative methods, particularly the use of a questionnaire pilot study (pilot test) means a test on a small scale (small-scale testing). The Pilot Test was also the beginning of the trial (preliminary trial) before items of the real test are imposed on real samples. The aim of the pilot test is to obtain data from trials transparently through a small group of individuals (Borg & Gall, 1979). Another objective is to evaluate the consistency (reliability) item from the item level, the objective item, item understanding, usability items and command item itself (Roid & Haladyna, 1982). Accordingly, the researcher has conducted a pre-test questionnaire containing 277 items in 48 dimensions to 30 fathers in the Early Intervention Program, Special Education Services Centre (3PK), Division of Special Education, Ministry of Education, Malaysia. From the pre-test findings, the researcher assessed the highest mean items using SPSS v22 for each dimension was summarizes only that 52 items were selected to be testing in a pilot study also to another 30 fathers in the Early Intervention Program, Special Education Services Centre (3PK), Division of Special Education, Ministry of Education, Malaysia.

Questionnaire. The study was conducted using questionnaires adapted and developed by researcher from questionnaires and surveys of the literature appropriate to collect data from fathers who have children with special needs involved in the early intervention program.

One set of questionnaire form was adapted and developed by researcher in this study consists of four (4) parts that will be answered by fathers who have children with special needs involved in the early intervention program. These parts are: (a). Section A: Demography of Respondent, (b). Section B: Father Involvement, (c). Section C: Early Intervention Program, and (d). Section D: Well-being of Children with Special Needs. This study used a seven point Likert Scale (Vagias, 2006) from 1 (Strongly Disagree), 2 (Disagree), 3 (Somewhat Disagree), 4 (Not Sure), 5 (Somewhat Agree), 6 (Agree) and 7 (Strongly Agree). Section A is related to demography of father. Parts B and D were adaptations of several questionnaires that correspond respectively to the father involvement and well-being of children with special needs, while Part C is built from a number of surveys on the literature for the early intervention program.

Father involvement construct as Father Involvement Inventory (Hawkins et al., 2002) had the value a = 0.95 (long version) by nine dimension and 35 items and a = 0.94 (shorter version) by nine dimension and 26 items. Senil (2010) using Father Involvement Inventory by Hawkins et al. (2002) found the value a = 0.86 by six dimensions and 25 items. The Well-being of Children with Special Needs construct also used the Well-being of Malaysian Family Questionnaire (LPPKN, 2011) recorded a value of a = 0.928, which has seven dimensions and 123 items (Parent).

Three constructs of father involvement, early intervention program and well-being of children with special needs were identified for this study. Constructs in this study include items adapted and developed from some questionnaires and some related literature review, namely: (a) Father involvement constructs adapted from Father Involvement Inventory (Hawkins et al., 2002); and Father Involvement Survey - Turkish Form (Senil, 2010), (b) Early intervention program constructs developed from previous studies from Module 1: Basic Early Intervention Program by NICHCY (2012); Principles for Effective Parenting Skills Program (Sanders et al., 1999); Effectiveness Quality Intervention Program (Moore et al., 2001); Family Support Program (Schorr, 1997); Principles of Service Provision (Schorr, 2000); and Prevention Program (Fónagy, 2001), and (c). Well-being of children with special needs adapted from the Well-being of Malaysian Family Questionnaire (LPPKN, 2011).

Three constructs of father involvement and well-being of children with special needs

were derived from a number of questionnaires adapted and early intervention program of the few surveys of literature to develop a questionnaires. A construction item to construct the early intervention program was formed by rational-intuitive approach (Hase & Goldberg, 1967). Implementation of this approach was based on the subjective opinions of the researcher (Azizah, 2012) and also on other studies. Researcher developed items after being approved by three experts for the construct tentative early intervention program under the Module of Basic Early Intervention Program by NICHCY (2012) and five studies of literature Principles of Effective Parenting Skills Program (Sanders et al., 1999); Qualities of Effective Intervention Program (Moore & Moore, 2001); Supporting Families Program (Schorr, 1997); Service Delivery Principles (Schorr, 2000); and Prevention Program (Fónagy, 2001).

Validity and reliability construct of assessment questionnaire results described in this study to assess the Reliability of Composite Reliability for Individual Item Reliability, Internal Consistency Reliability and Average Variance Extracted (AVE); and to assess the Validity for Convergent Validity and Discriminant Validity in PLS-SEM.

Composite reliability values have exceeded 0.70, which is the minimum level (Nunnally & Bernstein, 1994) for all constructs and not less than 0.80 (Fornell & Larcker, 1981). Composite reliability value of 0.70 to 0.90 is appropriate (Nunnally & Bernstein, 1994). However, Cronbach alpha for 3 constructs involved was negligible (Hair et al., 2014) because of values below 0.70 and should reach above 0.70 (Chin 2010). Therefore, composite reliability accepted in PLS-SEM has also measured the value of Cronbach alpha (Barroso et al., 2010). Thus, composite reliability for internal consistency reliability (Nunnally & Bernstein, 1994) and individual item reliability (Hair et al., 2014) have been met in this particular study especially convergent validity. However, Cronbach alpha values are ignored because composite reliability has been met (Hair et al., 2014).

The values of factor loadings or outer loadings to assess individual items reliability have exceeded 0.708 (Hair et al., 2014) while the reliability of composite exceeds the minimum 0.70 and average variance extracted (AVE) exceeds the minimum 0.50 (Hair et al., 2014). In this study also, values > 0.708 has been received or maintained (Hair et al., 2014) as the composite reliability (> 0.70) and AVE (> 0.50) respectively have been met. AVE also exceeds the value 0.50 (Fornell & Larcker, 1981).

The values of latent variables or constructs are greater than the correlation between the different latent variables (Fornell & Larcker, 1981) based on Fornell- Larcker Criterion and Cross Loading. In addition, Heterotrait-Monotrait Ratio (HTMT) represents the latest methods in discriminant validity test and its acceptance in the study. This confirms that this questionnaire fulfils the criteria of discriminant validity.

Results

Based on these findings found that items that represent each construct have suitable reliability or individual item reliability (Hair et al., 2014). There are seven significant items representing three constructs which are well-being of children with special needs affected by two items (child health, and child housing and enviroment); early intervention program affected by two items (individual family service plan, and screening); and father involvement influenced by three items (thought process, shared interest, and time).

Those findings of path model (Figure 2) in this study using PLS-SEM via software SmartPLS 3 are significantly based on past studies found in the theoretical framework. Accordingly, the findings of this study prove that measures seven items in three constructs (Table 2) are significant and appropriate to father involvement in the early intervention program for the well-being of children with special needs.

The results showed a positive and significant relationship between father involvement with early intervention program (ß = 0.521, $p < 0.05$). Results of this study support the findings of previous studies (Dunst et al., 1994; Flippin & Crais, 2011; IDEA Part C, 2004; 2011; Sloper, 1999; Stalker, 1990) which proves that the relationship between father involvement with early intervention program is positive and significant in the context of the father involvement in the early intervention program. Father involvement clearly play a large role in influencing the existing early intervention program.

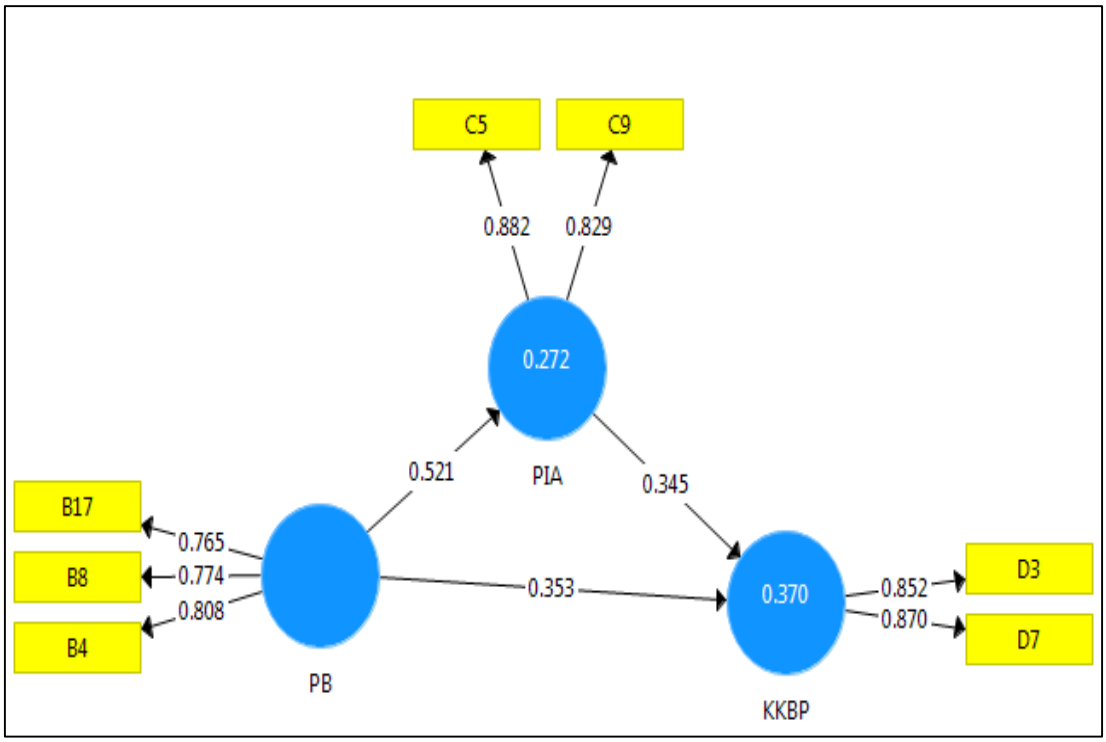

Figure 2.
Findings of path model pls-sem using smartpls 3.2.3 software.

Table 2.
Item represent each statement construct and dimensions.

Constructs (Latent Variables)	Item Codes	Item Delegation (Dimensions)	Item Statements (Reflective)
Well-being of Children with Special Needs (KKBP)	D3	Child Health	I have found in the last 6 weeks ago my child happy.
	D7	Child Housing and Environment	I found the basic facilities in a residential area so good for my child.
Early Intervention Program (PIA)	C5	Individual Family Service Plan (IFSP)	I found IFSP need the cooperation of relevant groups to review the functionality of the development of children with special needs.
	C9	Screening	I think that there is any activity that requires written permission program in my screening.
Father Involvement (PB)	B4	Thought Process	I plan for the future of my child.
	B8	Shared Interests	I read with my child.
	B17	Time	I allocate time just talking with my child when my child wants to talk about something.

The results of analysis show positive and significant relationship between the early intervention program and well-being of children with special needs (ß = 0.345, p < 0.05). Results of this study support the findings of previous studies (Dunst, 2007; Dunst, Hamby & Brookfield, 2007; Holm & McCartin, 1978; Linder, 1983; Newborg, Stock & Wnek, 1989; Robinshaw, 1994; See, 1999) which prove that the relationship with the early intervention program with well-being of children with special needs is positive and significant. In the context of the early intervention program against well-being of children with special needs, the early intervention program clearly played a major role in influencing the well-being of children with special needs.

Furthermore, the results show a positive and significant relationship between father involvement and well-being of children with special needs (ß = 0.353, p < 0.05). Results of this study support the findings of previous studies (Dunst, 1985; Gleason, 1975; Flippin & Crais, 2011; Middleton, 1995; Pellegrini, et al., 1985; Pleck & Masciadrelli, 2004; Shannon et al., 2002; Sloper, 1999; Sloper & Turner, 1993; Tannock, 1988) which prove that the relationship of father involvement with well-being of children with special needs is positive and significant. In the context of the father involvement against well-being of children with special needs, the father involvement clearly plays a large role in influencing the well-being of children with special needs widely not only in child development.

The analysis results showed the existence of a mediator or intermediary relationships of early intervention program between father involvement and well-being of children with special needs [PB -> PIA (8.895), PB -> KKBP (4.562) and PIA -> KKBP (3.836) is significant, and PB -> KKBP also significant (4.562) and VAF = 0.50 (*partial mediation)*]. Results of this study customize the last adaptation findings (Hebbeler et al., 2007) and prove that the early intervention program must exist as a mediator of the relationship between father involvement and well-being of children with special needs is significant. The importance of the early intervention program as a liaison between father involvement and well-being of children with special needs necessarily the role of the early intervention program should exist between father involvement and well-being of children with special needs.

Discussion, Conclusions and Suggestions

Main Findings

An early intervention program as a mediator. Previous studies found that in the implementation of the early intervention program has the effect of moderator to progress the development of children with special needs under the age of 3 years (Shonkoff & Hauser-Cram, 1987) and the father involvement as a moderator in the relationship mother-father-child (Rohner & Veneziano, 2001) in addition to Hebbeler et al. (2007) whoes only mention other services affected by the family and child returns.

Early intervention program as mediator findings in this study has provided intermediate a strong relationship between father involvement and well-being of children with special needs. This is based on evidence upon which the existence of the early intervention program indirectly is necessary to give effect to the well-being of children with special needs. Early intervention program is also a strong link between father involvement and well-being of children with special needs in this study. This study shows that father involvement in early intervention program for the well-being of children with special needs has been proved that the early intervention program is a mediator or intermediary relationship between father involvement and well-being of children with special needs.

Contribution

Model of Father Involvement in Early Intervention Program for The Well-Being of Children with Special Needs. This model contributes in terms of theory and practice. The contribution of the theoretical aspects in see through the development of models of father involvement, early intervention program and well-being of children with special needs with the addition of several new variables by combining theories such as ecological theory (Bronfenbrenner, 1979, 1986, 1989), theory of identity (Erikson, 1968) and theory of human needs (Maslow, 1943, 1998) that finally developed a Model of Father Involvement in Early Intervention Program for The Well-Being of Children with Special Needs (Figure 3).

Moreover, the discovery of mediator in this study contributes to the increase of existing models. Previously a number of studies

(Rohner & Veneziano, 2001; Shonkoff & Hauser-Cram, 1987) attributed the moderator rather than a mediator in the study of the early intervention program. These findings prove that the early intervention program is the primary contribution between father involvement and well-being of children with special needs. Importance of early intervention program will need support of father involvement for the well-being of children with special needs.

The model is also able to make a practical contribution to the field. This model shows that the father involvement is the strongest variable in influencing early intervention program and well-being of children with special needs different with early intervention program in influencing well-being of children with special needs. This means that the father involvement has a strong influence on the effectiveness of the early intervention program and enhances the well-being of children with special needs.

Future Research

The implementation of the early intervention program in particular could use model of father involvement in early intervention program for well-being of children with special needs. This model can be expanded in line with the latest findings for Malaysia. The further study in future is scrutinized with emphasis Early Screening (Figure 4) especially for finding children with special needs under the age of 4 years, which has not been involved or dropouts in the early intervention program.

Conclusion

In conclusion, implementation of qualitative in-depth study with responders of children, mothers, officials in 3PK, policy makers, experts and non-governmental also to be involved with fathers was needed by future researchers to explore indicators of father involvement (process thought, shared interest, and time), early intervention program (individual family services plan and screening), and well-being of children with special needs (child health, and child housing and environment).

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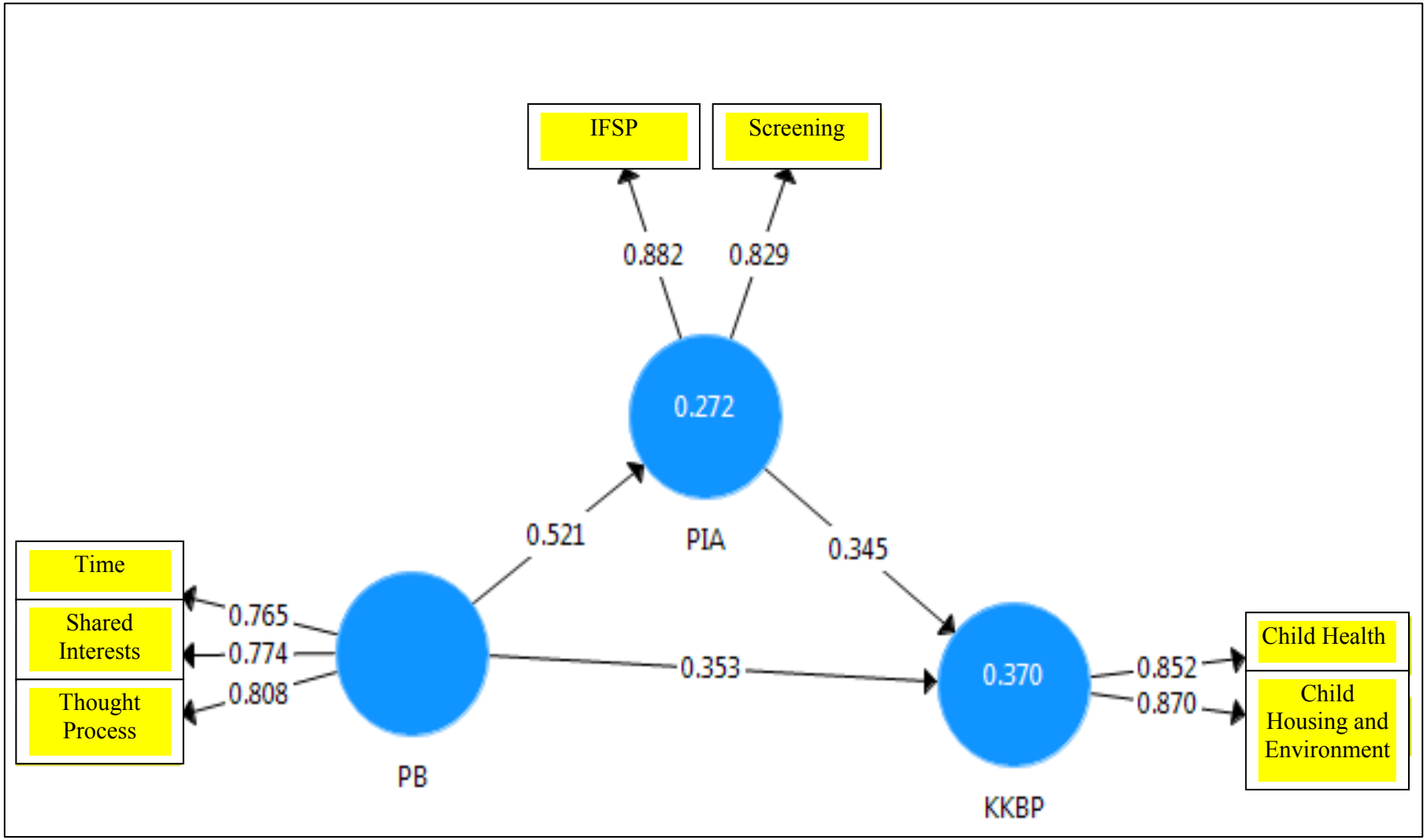

Figure 3.
Model of father involvement in early intervention program for the well-being of children with special needs.

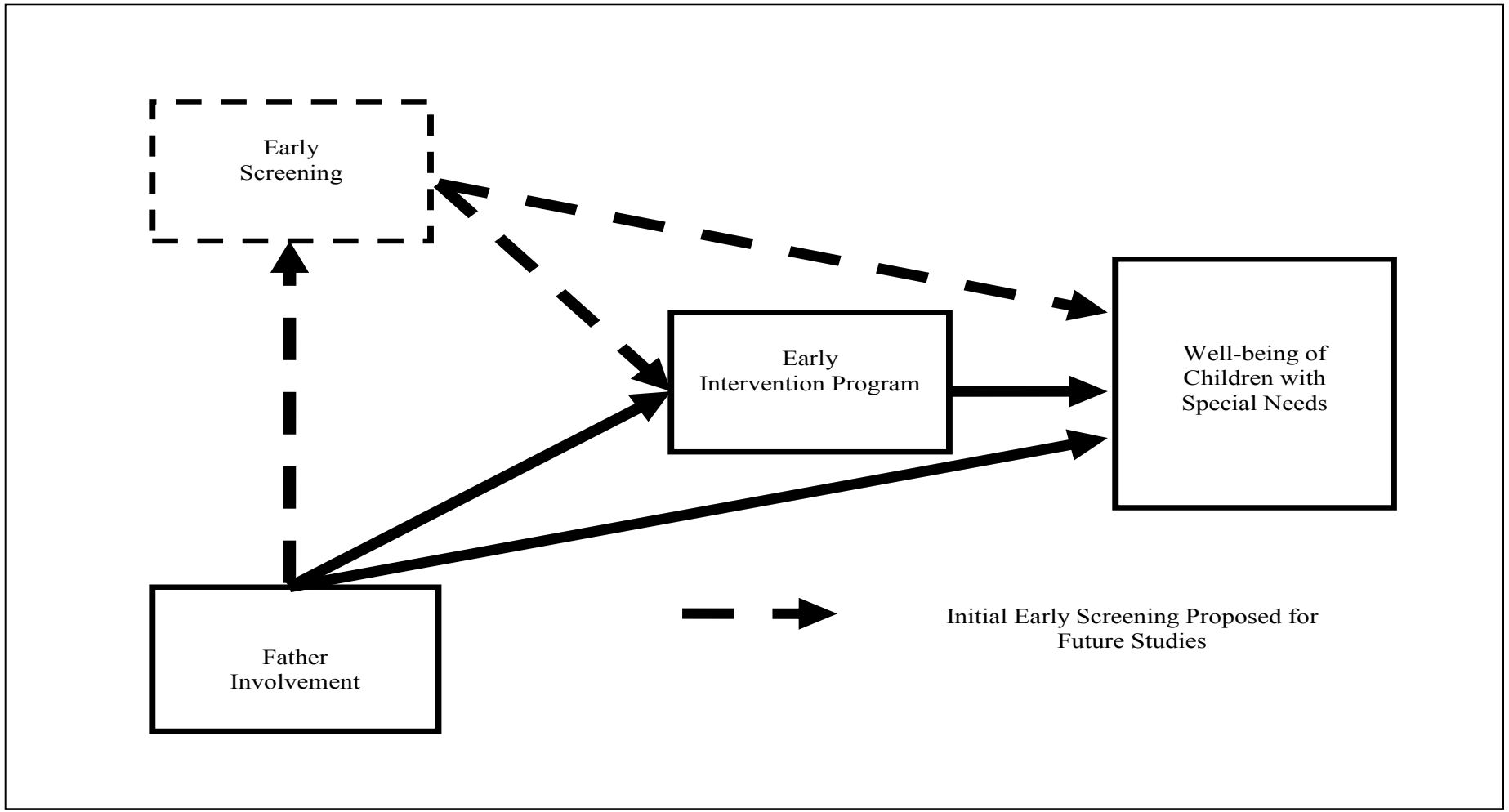

Figure 4.
Conceptual framework of father involvement in early intervention program for the well-being of children with special needs with the addition of early screening construct.

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Binnur Yildirim Haciibrahimoglu [1]

Book Review
Family-Centered Early Intervention: Supporting Infants and Toddlers in Natural Environments by Sharon A. Raver Dana C. Childress

Family-Centered Early Intervention: Supporting Infants and Toddlers in Natural Environments is a guide book that provides knowledge and skill for families need to promote optimal development in children with and at risk for developmental delay from birth to age 3. Edited by Ph. D., Sharon A. Raver and M. Ed. Dana C. Childress, the book has significant contributions in the field of early childhood intervention. In the book, the information provided is well written and easy to understand for families, teachers and working professional. The book moves beyond general issues of how to work with young children from birth to three and their families and provides greater depth regarding how to actually plan interventions that will address the needs of children and families.

The book is organized into ten chapters and four sections. The first section is entitled "Foundations of Early Intervention" and lays the foundation for the early intervention. The second section, "Supporting Families in Natural Environments" describes the details of individualized family service plan.

The third section is called "Enhancing Infant and Toddler Development and Participation" and highlights the acquisition and use of knowledge and skills to meet needs. The final section, "Supporting Children with Diverse Abilities", presents specific intervention strategies for facilitating development with particular delays. Each chapter begins with a case study of an infant/ toddler served through early intervention.

The first two chapters of the book provide the foundations of early intervention and followed by a chapter on collaboration and teamwork with families and professionals. This first chapter begins with early interventions characteristics according to Part C of Individuals with Disabilities Education Improvement Act (IDEA) and describes the key principles of early intervention. The first chapter also introduces laws and policies in the system of early intervention. Family-centered practices, intervention in natural learning environment, routine-based intervention, participation-based intervention and coaching and consultation are discussed in the chapter. Collaboration and teamwork with families and professionals are explained in chapter two. In chapter two, authors discuss the importance of family-professional collaboration, the family-centered approach and family systems theory, the early intervention team and strategies for effective collaboration and communication. The authors describe the process of the family-centered approach and roles of team members in early intervention process.

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Common problems in team experiences (expectations, communication, disagreement, confidentiality) are included. This chapter provides deeply information that will help team members to know and apply the principles to the family-centered early intervention.

The second section of the book focuses on supporting families in natural environment. The individualized family service plan (IFSP) process is described in chapter three. This chapter describes the important step of the individualized family service plan including referral, intake, evaluation and assessment. Authors also emphasize the collaborative process in the development of IFSP. Chapter three focus on team members' roles and explain that team members in the IFSP depend on who is most appropriate to develop an individualize plan for the child and family. In chapter four, author moves readers into the next step in intervention. The chapter discusses the implementation of early intervention within the context of families' everyday routines, activities and settings. The author provides a framework for developing about how families support the child's development in daily routines and activities. An extensive review of the literature on family guided routines based intervention which was initially developed Woods (2012), can be found in the chapter by with recommendations for using phases (program planning, intervention, community teaming and collaboration, progress monitoring and transition).

Section II, in my opinion, is the strongest portion of the book. This section provides detailed information on issues to enhance infant and toddler development and participation in natural environment with families. Developing positive social-emotional and communication skills is covered in Chapter 5. The authors first examine typical communication and social skills and then how to adjust or modify activities an any natural environment to better support a child's social-emotional and communication development. This chapter will help user to spend time engaging the child in social play, reading books and having conversation every day. Chapter 6 discussed issues related to learning to use knowledge and skills. It begins with a discussion typical cognitive development and Piagetian theory and effects of early experiences. The chapter also includes adaptations of material, equipment, furniture and space influence how and what children participate in and learn. It encourages families to use situated learning, contingency responsiveness and responsive contingent learning to guide children in how to make sense of their world. The authors explain that using a child's strengths and interests, arranging all environments for increased control by the child and addressing multiple skills within one activity or routine promote a child's acquisition of knowledge and skills.

In chapter 7, Toby M. Long discusses how infants and toddlers become more independent by learning how to manage some of their personal needs including the following: gross and fine motor development, adaptive development, service delivery model, assessment practices, and assistive technology. The author recommends that depending on a child's needs, physical therapists, occupational therapists and other service provider work together to encourage a child to practice adaptive skills, and the use of low and high assistive technology maximize a child's functional skills. Chapter 7 continues the discussion of using appropriate behaviors to meet the infant and toddler's needs. Early intervention service providers often assess a child's development in preparation for writing the individualized family service plan. These assessment purposes are discussed in the chapter.

The fourth section of the book is about supporting children with diverse abilities. Three chapters make up this section. Strategies and supports for infants and toddlers with Autism Spectrum Disorder are explained by Childress, Meyer and Maedan in chapter 8. This chapter begins with describing autism and provides information dispelling myths, prevalence and etiology about autism. Communication and social interaction which are the most commonly affected in very young children are then described. Importance of early identification and screening in autism are discussed and some case studies are examined how to implement intervention practices and prevention of challenging behavior. Although specific intervention steps are not described for each of case studies, the authors provide summaries of effective strategies that interventionists can investigate further.

Chapter 9 addresses the infants and toddlers with sensory disabilities. This chap-

ter discusses issues relating to serving children with sensory disabilities and their families including the following: causes of visual and hearing impairments, impact of visual impairment or hearing loss on child development, best practices highlights for children with visual and hearing impairments. The authors acknowledge that early intervention personnel should be to understand the child's visual impairment and determine which senses are viable avenues of learning. The chapter also suggests that early intervention personnel should talk with families having a child with hearing impairment about their communication preferences and integrate their choice into intervention sessions. Several interventions designed to increase the potential of children with disabilities are also included in this chapter. Chapter 10 continues the discussion of infants and toddlers with cognitive and/or motor disabilities. This chapter discusses the causes, prevalence and types of associated disorder and disabilities. It is mentioned that early detection opens the door to early initiation of appropriate medical and developmental interventions for the children and their families. Neuromotor disorders and chromosomal, genetic, metabolic and endocrine disorders are discussed in the chapter. Chapter 10 also describes that there will be a diverse group of professionals with medical, health care, and early intervention training to guide the family having a child with cognitive and/or motor disabilities. This chapter also gives information that children with cognitive and/or motor delays and disabilities often require additional supports. Because of this collaboration and coordination between the child's medical specialists and the early intervention team are seen essential.

This book provides an integrated and well-organized look at intervention process for the early childhood period. Overall, this book is a valuable resource because it describes how to build interventions for children with special needs and their families. It could be a useful book to support courses preparing early childhood and early childhood special teacher. Also, it could be used for other personnel in early intervention team. The authors provide the necessary framework to help teachers and specialists build interventions (i.e., the screening, evaluation process, assessment components and intervention activities). This book illustrates the entire intervention planning and implementation process and includes examples of interventions. This book is a fine addition to any practitioner's library.

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Arithmetic School Readiness of Preschoolers with Hearing Impairment

Abstract

The study aimed to examine the difficulties of children with hearing impairment in acquiring arithmetic skills at the preschool stage. Two groups of children, one with hearing impairment and another who were typically developing were assessed on a 'Pre-Arithmetic School Readiness Test'. The test that was developed as a part of the current study elicited responses for questions presented through the visual and auditory modality, for questions that required open and closed set responses. The findings of ANOVA, MANOVA and independent t-test indicated that the children with hearing impairment performed poorer than the typically developing children in three of the four subcategories of the test (auditory-open, auditory-closed, & visual-open). The only sub-section where the children with hearing impairment performed better was the visual-closed sub-category. While the children with hearing impairment performed similar to the typically developing children on tasks involving number concepts and shapes, they performed poorer on fundamental operation of addition and subtraction. The test was found to be sensitive to the difficulties of the children with hearing impairment in acquiring arithmetic concepts as it differentiated the performance of the two participant groups.

Keywords: Pre-arithmetic skills, open-set performance, closed-set performanc, number concept, fundamental operation

Introduction

The importance of early childhood education that includes preschool education has been strongly advocated for all children. Ginsburg (1997) noted that informal concepts formed the prerequisites for formal learning of arithmetic in the later stages of schooling. Likewise, Kaul (2002), based on extensive experience, opined that preschool exposure helps cognitive development of children during primary education and has a strong bearing on attendance and participation once they enter formal school. Policies across Europe (Christopher, 1994) and in the United States of America (Bassok, Fitzpatrick, Loeb, & Paglayan, 2013; Stipek, 2002) make it a mandate that all children undergo preschool education. Similarly, in India, the Kothari Commission (1966) and the National Policy of Education (1986, amended in 1992) recommends the need and importance of early childhood care and education. Evidence from literature indicates that children with hearing impairment perform poorer in academics compared to their hearing peers (Nunes, 2004; Nunes & Moreno, 2002; Powers, Gregory, & Thoutenhoofd, 1999; Swanwick, Oddy, & Roper, 2005). Besides having difficulties in language, several studies have demonstrated that children with hearing impairment have considerable problems in mathematical abilities (Nunes & Moreno, 2002; Pagliaro & Kritzer, 2013; Pau, 1995; Stewart & Kluwin, 2001; Wood, Wood, & Howarth, 1983). Stewart and Kluwin (2001) found school-going children with hearing impairment to be underachievers in mathematics. They reported of a disparity in mathematical achievement performance of children with hearing impairment and their hearing counterparts on the Stanford Achievement Test. Although the performance in mathematics of the children with hearing impairment was better than their reading performance, the performance in both areas was below the grade expectancy.

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Similarly, Pau (1995) found that children with hearing impairment studying in primary school had difficulty comprehending verbal mathematical problems. This led to the children having considerable difficulty in arithmetic problem solving. Contrary to studies that reports of children with hearing impairment having difficulty in mathematics, Paranjape (1998) found such children to perform poorer in language but not in mathematics when compared to normal hearing children. These findings were based on the performance of children on achievement tests. However, Paranjape did not indicate whether the performance was grade appropriate or not.

Studies have highlighted that children with hearing impairment often fall behind their hearing peers due to a lack of educational experience during their early years (Gregory, 1998; Nunes, 2004; Nunes & Moreno, 2002). Exposure to preschool education was found to equip children with hearing impairment for better and successful higher education (Nunes & Moreno, 1998). Children with hearing impairment, admitted into formal schooling without any prior training, were reported to face difficulty and failure in the school. Hence, it was recommended that they should be prepared prior to getting into formal schooling by undergoing quality preschool education (Nunes & Moreno, 1998). Mauk and Mauk (1992) considered preschool age to be ideal to identify the problems faced by children with hearing impairment and for corrective measures to be implemented. Studies have also reported of poor preschool experience resulting in reduced mathematical abilities in children with hearing impairment (Nunes & Moreno, 2002; Pagliaro & Kritzer, 2013). Nunes and Moreno (2002) noted that many early informal mathematical skills developed prior to formal schooling were not evident in young children with hearing loss. Pagliaro and Klitzer (2013), who examined early mathematics concepts of children with hearing impairment in preschool, reported of strong evidence that their difficulties in mathematics began prior to the start of formal schooling. Pagliaro and Klitzer (2013) also reported that in their participants, the mathematic area of strength was 'geometry' and the areas of weakness were 'problem solving' and 'measurement'.

Thus, it is evident that in children with hearing impairment, difficulties in mathematics commences prior to formal schooling. Hence, it is essential that their specific problems in acquiring early mathematical skills be explored to know the areas of difficulty so that it can be addressed as early as possible. Such assessment would help know the performance level of children and help in making appropriate decisions regarding educational placement, the types of supports required and referral for special educational services. Although this process is important for all children, it is more important for children with hearing impairment. Thus, the present study aimed to develop a school readiness tool and establish its effectiveness in identifying the mathematical difficulties of children with hearing impairment. Audition and vision being the two important modalities used in learning, the study also aimed to evaluate responses through these two modalities using open-set and closed-set questions. Hence, the research questions addressed in the study were:

a. Is there a difference between the acquisition of pre-arithmetic skills at the end of pre-school across children with hearing impairment and typically developing children?
b. Is there a difference in acquiring pre-arithmetic skills through the visual and auditory modality across children with hearing impairment and typically developing children?
c. Is there a difference in performance on open-set and close-set questions that test pre-arithmetic skills across children with hearing impairment and typically developing children?
d. Can a pre-arithmetic school readiness test detect the specific difficulties of preschool children with hearing impairment?

Method

The study was carried out in two stages. In the first stage the test material was developed and the second stage dealt with field-testing the developed test. The field test was done on typically developing children who had normal hearing and children with hearing impairment.

Participants

Two groups of participants were included in the study. Group-I consisted of 100 typically developing children without hearing impairment of whom 25 were used for Stage-1 (17 males & 8 females) of the study and the remaining 75 were used for Stage-II (29 males & 46 females). Group-II had 37 children with hearing impairment (20 males & 17 females).

The children in Group - I were preschoolers aged 4½ years to 5 years. For Stage-I of the study, ten children were selected from two regular schools where the instruction was imparted in English and 15 were selected from five regular schools where the instruction was in Kannada, a language spoken in south India. The 75 children selected for Stage-II of the study were from seven schools with English as the language of instruction and five schools with Kannada as the language of instruction. From the former, 40 children and from the latter 35 children were tested on the tool designed for the study. All the schools were located in Mysore city.

The typically developing children had no hearing problem, no history of ear discharge and no other disabilities, as reported by their teachers. The absence of a hearing problem had been confirmed earlier through routine pure-tone screening using Interacoustics PA5 handheld audiometer. Additionally, none of them were reported to have any problem with their school performance. It was ensured that the children selected for the study had been taught in school the mathematical concepts recommended in the syllabus for preschoolers.

The children in Group - II, aged 5 to 6 years, were selected from four special schools, from Mysore and Bangalore, cities in the southern part of India. The children had bilateral severe to profound sensorineural hearing loss, as mentioned in the audiological reports available in the schools. All the children wore for more than two years, binaural behind-the-ear / pseudo-binaural body level hearing aids, prescribed by qualified audiologists. Only those children who were reported to have no additional disability were selected. The children with hearing impairment were reported to have language levels appropriate for the class in which they were studying. All the children had undergone specialized speech and language training and / or specialized preschool training for approximately one year.

Procedure:

Stage I: Development of test material

The development of the material involved the following: Compilation of the test materials; validation of test items with professionals and caregivers; and validation of test item on typically developing children.

Compilation of Test Items

The syllabi for mathematical skills followed in ten regular preschools in and around Mysore were referred since no standard syllabus was available for preschools. The content in the ten syllabi that were common were selected to be included in the test. The compiled test items covered three major areas to assess the arithmetic skills of preschool children. These included number concepts, fundamental operation including concept / application of fundamental operation and shapes. Further, the test material was designed such that the stimuli were presented either auditorily (presented orally) or visually (presented as pictures, written information or objects). This was done to tap the performance of children when the stimuli were presented either through the auditory or visual modality. For the items that were to be tested visually, pictures, written material and objects were compiled. Additionally, the test items were designed to elicit open set responses (where responses were obtained without choices being provided) or closed set responses (where choices were provided for the child to select). Details of the developed test are provided in Table 1. The test material was prepared in English as well as Kannada.

Validation of test items with professionals and caregivers

Validation of the compiled material was done by getting feedback from 35 professionals who dealt with the training of typically developing children / children with hearing impairment. The professionals included ten regular preschool teachers, ten regular primary school teachers, ten special preschool teachers and five speech and hearing professionals. The teachers / professionals were required to indicate whether the concepts as well as the test items were appropriate or not in relation to the syllabus followed by the

preschools. Additionally, they had to specify if the vocabulary and concepts were age appropriate in both the English and Kannada versions of the test. They also had to indicate whether the two language versions of the test were similar. Modifications and suggestions given by the teachers / professionals were incorporated if more than 10% of them recommended a change.

Validation of the test items on typically developing children

The developed 'Pre-Arithmetic School Readiness Test' was administered on 25 typically developing children studying in seven different schools. The children were tested individually in the school premises in quiet rooms, free from distraction. They were seated comfortably prior to the commencement of the test. They were instructed orally in Kannada or English, depending on the medium of instruction of the school, regarding what they were expected to do. Breaks were given during the testing, if a child showed any sign of fatigue or restlessness. The children received no feedback as to whether they were right or wrong. Each test item was presented only once. The test items were retained only if more than 80% of the children responded positively. Using the material that could be carried out by more than 80% of the children, the test items were finalized. The major task under fundamental operation that had to be eliminated was 'Subtract the object and write the number'. Additionally, the shape 'diamond' had to be removed since many could not identify it.

Stage II**:** Field testing of the 'Pre-Arithmetic school readiness test'

The developed test was field tested on 75 typically developing children and 37 children with hearing impairment who met the participant selection criteria. Each child was tested independently after being seated comfortably in a distraction free room. The child was seated in front of a table having appropriate height for preschool children. The tester was seated at a distance of 1 meter from the child, on the opposite side of the table on which the test material was placed facing the child.

The instruction for each task was provided orally, one at a time, in the order of the tasks mentioned in Table 1. The instructions were provided using a vocal effort that is typically used when talking to a person seated 1 meter away. Along with the instruction, the visual material appropriate for the task was placed in front of the child on the table. The instruction for the next task was given only after giving adequate time for the children to complete the previous task. The instruction for a particular task was repeated once, using a constant vocal effort, if a child indicated difficulty in understanding what was said. It was ensured that when a particular task was being evaluated, the child could not view the material for the other tasks. No help was provided by the tester to carry out the tasks. If a child was unable to perform a particular task after the repetition of the instruction, evaluation of the next task was carried out. The children received no feedback as to whether their responses were correct or wrong.

While testing the children with hearing impairment, it was initially established that they wore their prescribed hearing aids that were in working condition. Children who depended on speech-reading were allowed to watch the tester when the instructions were given, in addition to listening. Depending on the task, the responses from the children varied as indicated in Table 1. The responses, for tasks that required oral or pointing responses from the children, were noted by the tester on a response sheet. Depending on the speed at which a child responded, the test time ranged from 30 minutes to 45 minutes.

The study was carried out adhering to the 'Ethical guidelines for bio-behavioral research involving human subjects' (2009) of the All India Institute of Speech and Hearing, Mysore. Consent of the caregivers was obtained prior to evaluation of the children.

Scoring

The score for the different test items varied depending on the simplicity of the tasks. In general, a correct response was given score of 1 and an incorrect response a score of 0. Only two of the tasks ('Count and tick the correct number' & 'Match the number to number') were assigned a score of 0.5 for a correct answer and 0 for an incorrect answer. Lower scores were assigned to these tasks due the simplicity of the tasks compared to

Table 1
Details of the "Pre-Arithmetic School Readiness Test"

Concepts	Test Tasks	Task description	Response mode	No. of Items	Score per correct Response	Maximum possible score
Number Concept	1. Count & write	Pictures of familiar objects are shown and the child is required to count and write the number of objects.	VO	5	1	5
	2. Count & tick the correct number	Pictures of familiar objects are shown and the child is required to count and point/tick the number of objects from the given written choices.	VC	5	0.5	2.5
	3. Write the missing number (Before)	A written number is provided with a blank space before and after it. The child is expected to fill in the blank with a number that comes prior to the written one.	VO	5	1	5
	4. Write the missing number (After)	A written number is provided with a blank space before and after it. The child is expected to fill in the blank with a number that comes after the written one.	VO	5	1	5
	5. Listen and answer the statement (before)	To the oral command of the tester, the child has say what number comes before a particular number.	AO	5	1	5
	6. Listen and answer the statement (after)	To the oral command of the tester, the child has to say what number comes after a particular number.	AO	5	1	5
	7. Match the digits	Two columns of numbers (digits) are shown. The child is expected to match the numbers in the two columns.	VC	5	0.5	2.5
	8. Match the digit and word numbers	Two columns of numbers, one with digits and the other with the same numbers in words are shown. The child is expected to match the numbers.	VC	5	1	5
	9. Listen and point at the number	Five numbers (digits) are shown. The child is required to point to the number said by the tester.	AC	5	1	5
	10. Listen and point to the word	Five numbers (words) are shown. The child is required to point to the number said by the tester.	AC	5	1	5

(Table 1 continued)

Fundamental Operation - (Addition)	1. Add the objects and write the number	Two groups of objects are shown with the symbol '+' between them. The child is required to add the two groups and write the answer.	VO	5	1	5
	2. Addition (statement problems)	The child is shown two sets of objects and is provided simple instructions such as "I have 2 pens, mother gave me 2 more. How many do I have now"? The child is required to point to the 2 written choices given, one correct and the other wrong.	VC	5	1	5
	3. Auditory (statement problems)	The child listens to simple statement problems regarding addition, with no visual clues and no options provided. A verbal response is required.	AO	5	1	5
	4. Auditory (statement problems)	The child listens to simple statement problems regarding addition, with no visual clues but with 2 written options provided. The child points to one of the choices provided.	AC	5	1	5
Fundamental Operation- (Subtraction)	1. Subtraction (statement problems)	The child is shown two sets of objects and is provided simple instructions such as "I have 6 chocolates. I gave 2 chocolates. Do I have 4 or 3 chocolates remaining with me"? The child has to point to two written choices given.	VC	5	1	5
	2. Auditory (statement problems)	The child listens to simple statement problems regarding subtraction, with no visual clues and no options provided. A verbal response is required.	AO	5	1	5
	3. Subtraction (statement problems)	The child listens to simple statement problems regarding subtraction, with no visual clues but with 2 written options provided. The child points to the choices provided.	AC	5	1	5
Shapes	1. Color the shapes	From a choice of four line drawings of shapes shown, the child is required to color the one mentioned in a written instruction.	VC	4	1	4
	2. Name the shapes	The child is required to name the line drawing of a shape shown.	VO	4	1	4
	3. Show the correct shapes	The child is expected to show a shape said by the tester from a choice of four line drawing options presented.	AC	4	1	4
	4. Draw the following	The child is required to draw the shape said by the tester.	AO	4	1	4
Total items / marks				101		96

Note. *Total score for: Visual open (VO) = 24; Visual closed (VC) = 24; Auditory open (AO) = 24; Auditory closed (AC) = 24*

the other tasks. Details regarding the scores to be assigned to the different tasks are provided in Table 1. The total possible score for the 101 items was 96.

Results

The data were analyzed using SPSS (version 17) to compare the performance of the typical developing children with children with hearing impairment on the following: types of questions (open and closed) and questions tapping two sensory modalities (auditory and visual). Further, the performance of the children on the two types of questions and questions tapping two sensory modalities were also compared within each participant group. The data of all 100 typically developing children were analyzed after scoring only those questions that were selected in the final test. The data were analyzed using repeated measure ANOVA, MANOVA and independent t-test. A Mann-Whitney test was used to confirm the results of the parametric statistics between the participant groups, as the sample size differed considerably.

I. Comparison of scores between participant groups (typically developing children and children with hearing impairment)

The mean and standard deviation (SD) of the *overall performance* of typically developing children with children with hearing impairment is depicted in Table 2. It can be seen that the mean score of the typically developing children was higher than that obtained by the children with hearing impairment. Similarly, the SD was lesser in the typically developing group compared to the group with hearing impairment.

Table 2.
Mean and SD of the total test scores of the two groups

Groups	N	#Mean	SD	Lower bound	Upper bound	t value
Typically developing	100	92.6	4.32	77	96	6.38**
Hearing impaired	37	84.84	9.98	56	96	

Note. *# Maximum possible score = 96*
*** = p < 0.01*

A two-tailed independent *t*-test was performed to check if the difference in scores was significant. The *t*-test indicated that there was a statistically significant difference between the typically developing children and the children with hearing impairment [t (135) = 6.38, $p < 0.01$] for the overall scores. Since the sample size of the two groups was unequal, the result of the independent *t*-test was cross-checked with a non-parametric Mann-Whitney test. Similar results were obtained through both the statistical procedures (z = 4.67, $p < 0.01$).

Comparison of the mean and SD of the scores obtained for *questions tapping* table it is evident that for the visual based questions the mean scores were almost similar with not much variation in SD between the two groups. In contrast, for the auditory based questions there was a marked difference in the mean scores between the two groups. The SD was considerably more for the children with hearing impairment compared to the typically developing children. *visual and auditory modalities* (with types of questions combined) by the two groups of children can be seen in Table 3. From the

In order to determine how the two participant groups differed from each other for the visual and auditory based question, a MANOVA test was conducted. It revealed that there was a significant difference between the typically developing children and the children with hearing impairment for questions tapping the auditory modality [F (1, 135) = 53.93, $p < 0.01$, partial $\eta^2 = .29$].

In contrast, no such difference between the participant groups was seen for the visual based questions [F (1, 135) = 1.974, $p > 0.05$, partial $\eta^2 = .02$]. The non-parametric tests also showed a significant difference

Table 3.
Mean and SD of the scores for the modalities (visual & auditory) and type of questions (open & closed) for the two groups

		Groups	N	#Mean	SD	Lower bound	Upper bound	z values
Modality	Visual	Typically developing	100	47.63	1.32	47	48	0.51
		Hearing impaired	37	47.16	2.53	47	48	
	Auditory	Typically developing	100	45.03	3.76	44	46	5.09**
		Hearing impaired	37	37.43	8.34	36	39	
Question type	Open	Typically developing	100	46.65	1.84	41	48	-5.18**
		Hearing impaired	37	41.72	6.65	18	48	
	Closed	Typically developing	100	46.04	2.90	33	48	-4.42**
		Hearing impaired	37	42.83	3.95	38	48	

Note. *# Maximum possible score = 48*
*** = p < 0.01*

between the groups for the auditory based questions (z = 5.09, p < 0.01) but not for the visual based questions (z = 0.51, p > 0.05). A comparison of scores for *open and closed type of questions* (with modalities combined), for the two groups, indicated that the performance was similar to the earlier analyses. The performance of the typically developing children was better than that of children with hearing impairment for the open as well as the closed type of questions. Likewise, the SD was more for the children with hearing impairment in both the types of questions. This can be observed from the mean and SD provided in Table 3.

To compare the scores of the open and closed type of questions, a MANOVA test was carried out. A significant difference was seen between the two groups for the open [Wilks'Λ= .74, F (1, 135) = 45.73, p < 0.01, partial η^2 =.25] and closed [Wilks'Λ= .74, F (1, 135) = 26.88, p < 0.01, partial η^2 =.17] type of questions.

Similar findings were obtained using a Mann-Whitney test where there was a significant difference between the two groups for the open (z = -5.18, p < 0.01) and closed type of questions (z = -4.42, p < 0.01).

Comparison of *stimuli [question type (open & closed) & modality (visual & auditory)]* across participant groups was performed using a MANOVA. Additionally, the MANOVA output for the 4 variables (visual closed, visual open, auditory open, auditory closed) was cross checked with a Mann-Whitney test.

From Table 4 it can be observed that the typically developing children and the children with hearing impairment performed differently. The former group performed significantly differently on open and closed type of questions when they were visual based. However, in the latter group, this difference was not seen for the visual based tasks but was seen for the auditory based tasks.

Table 4.
Mean, SD and p values for responses to visual open, visual closed, auditory open and auditory closed questions for the two group

Type of question/ modality	Participant groups	N	# Mean	SD	Parametric Stat		Non-parametric Stat
					F	df	Z
Visual open	Typically developing	100	23.92	0.46	8.30	135**	-2.06**
	Hearing impaired	37	23.16	2.53			
Visual closed	Typically developing	100	23.71	1.14	2.39	135	-1.77
	Hearing impaired	37	24.00	.000			
Auditory open	Typically developing	100	22.73	1.77	55.96	135**	-5.32**
	Hearing impaired	37	18.76	4.77			
Auditory closed	Typically developing	100	22.30	2.30	39.64	135**	-4.77**
	Hearing impaired	37	18.86	3.95			

Note. # *Maximum possible score = 24*
*** = p < 0.01*

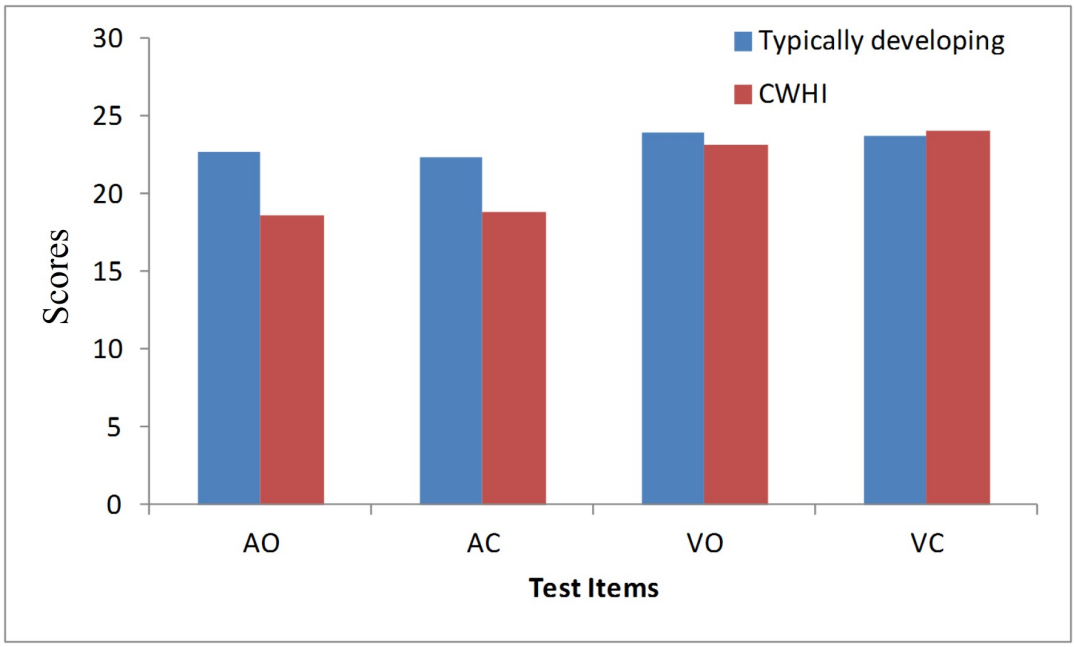

Figure 1.
Performance of typically developing children and children with hearing impairment (CWHI) for the auditory open (AO), auditory closed (AC), visual open (VO) and visual closed (VC) stimuli.

It is clear from Figure 1 that between the two groups there was a marked difference in scores for the auditory based questions. This marked difference was not present for the visual based items.

Table 5.
Summary of the comparison between typically developing children and children with hearing impairment (CWHI) for different stimuli

	Total score	**VO+VC**	**AO+AC**	**VO+AO**	**VC+AC**	**VO**	**VC**	**AO**	**AC**
Typically Developing Vs CWHI	p<0.01	p>0.05	p<0.01	p<0.01	p<0.01	p<0.01	p>0.05	p<0.01	p<0.01

Note. *VO = Visual open; VC = Visual closed; AO = Auditory open; AC = Auditory closed*

The two groups did not differ only for the visual based tasks, especially for the closed type of questions (Table 5). For all the auditory based tasks, there was a significant difference between the two groups.

II. Comparison of scores within participant groups (typically developing children and children with hearing impairment)

To determine whether there existed any significant difference between scores for type of questions (open & closed) and modality (auditory & visual), a repeated measure ANOVA was carried out within each of the participant groups. With the type (open & closed) and modality (auditory & visual) combined, there was a significant main effect for the typically developing children [Wilks'Λ=.64, F (1, 99) = 54.85, p < 0.01, partial η^2 =.36] as well as for the children with hearing impairment [Wilks'Λ= .36, F (1, 36) = 58.87, p < 0.01, partial η^2 =.62]. Since there was a significant main effect, a t-test was carried out to check the performance in type and modalities for each of the participant groups.

The t-test results indicated that for the *visual and auditory based questions in the typically developing group* (Table 6) there was a significant difference for the visual and auditory tasks. When the visual and auditory questions were sub-categorized as open and closed, the performance differed. For the visual tasks, no significant difference was seen between the open and closed question

($p > 0.05$). On the other hand, for the auditory based question there was a significant difference for the open and closed type of questions.

In the group of children with hearing impairment there was a significant difference between the total visual and auditory task as well as the visual open and the visual closed task ($p < 0.01$).

However, no significant difference was seen for the auditory open and auditory closed tasks ($p > 0.05$).

A comparison of scores of the *open and closed type of questions within each group* (Table 6) using a *t*-test indicated the two types of questions were significantly different. This was seen for the total scores of the open and closed type of questions as well as for the visual based and auditory based question in both participant groups.

Table 6.

Comparison of open and closed type of questions for visual and auditory based questions as well as visual and auditory based questions for open and closed type of questions in typically developing children and children with hearing impairment (CWHI).

Groups	Modalities & Type of Questions	Mean	SD	df	t
Typically developing	Visual total scores #	47.63	1.32	99	7.15**
	Auditory total scores #	45.03	3.76		
	Visual open scores ##	23.92	0.46	99	1.86
	Visual closed scores ##	23.71	1.14		
	Auditory open scores ##	22.73	1.77	99	2.60**
	Auditory closed scores ##	22.30	2.30		
CWHI	Visual total scores #	47.16	2.53	36	8.02**
	Auditory total scores #	37.43	8.34		
	Visual open scores ##	23.16	2.53	36	2.01**
	Visual closed scores ##	24.00	.000		
	Auditory open scores	18.76	4.77	36	0.68
	Auditory closed scores ##	18.86	3.95		
Typically developing	Open total scores #	46.65	1.84	99	2.63**
	Closed total scores #	46.04	2.90		
	Open visual scores ##	23.92	0.46	99	6.56**
	Open auditory scores ##	22.73	1.77		
	Closed visual scores ##	23.71	1.14	99	6.70**
	Closed auditory scores ##	22.30	2.30		
CWHI	Open total scores #	41.72	6.65	36	1.24**
	Closed total scores #	42.83	3.95		
	Open visual scores ##	23.16	2.53	36	7.49**
	Open auditory scores ##	18.76	4.77		
	Closed visual ##	24.00	.000	36	7.92**
	Closed auditory scores ##	18.86	3.95		

Note. *Visual total = Visual open + Visual closed;*
Auditory total = Auditory open + Auditory closed;
Open total = Open visual + Open auditory;
Closed total = Closed visual + Closed auditory
 # Maximum possible score = 48;
Maximum possible score = 24;
*** = p < 0.01*

III. Comparison of scores on specific mathematical concepts between participant groups

The findings of a one-way repeated measure mixed ANOVA indicated that there existed no significant difference between the typically developing group and the group with hearing impairment for number concept [F (1, 135) = 3.06, $p > 0.05$, partial $\eta^2 = .02$] and knowledge of shapes [F (1, 135) = 1.00, $p > 0.05$, partial $\eta^2 = .01$]. However, the children with hearing impairment performed significantly poorer

than their typically developing counterparts on the two fundamental operations that were evaluated, addition [F (1, 135) = 31.84, p < 0.001, partial η^2 =.19] and subtraction [F (1, 135) = 58.64, p < 0.001, partial η^2 =.3]. Due to the unequal sample size in the two participant groups, the results were verified using a non-parametric statistical test. Similar to what was observed with the parametric test, the Mann-Whitney test highlighted that a significant different between the groups for 'number concept' (z = -.522, p > 0.05) and knowledge of shapes (z = -1.06, p > 0.05) was absent, but was present for fundamental operations of addition (z = -4.410, p < 0.001) and subtraction (z = -5.4, p < 0.001).

To establish whether extraneous factors such as the school in which the children studied and the medium of instruction had an impact of the performance of the children with hearing impairment, further analyses were carried out. A Kruskal-Wallis test was performed to determine whether there was a significant difference between the 4 special schools (2 in Mysore & 2 in Bangalore) and the 2 mediums of instruction (English & Kannada).

From the findings of the Kruskal-Wallis test, no significant difference was observed between the four different special schools, [χ^2(3, N = 37) = 2.5, p > 0.05] as well as the 2 languages (χ^2(1, N = 37) = 0.39, p > 0.05).

IV. Reliability of the Pre-Arithmetic School Readiness Test

The reliability of the pre-arithmetic school readiness test was checked by computing Cronbach's α separately for each of the participant groups. This was done separately for visual open scores, visual closed scores, auditory open scores, auditory closed scores as well as for the overall test scores. From Table 7 it can be seen that the Cronbach's α values ranged from .83 to .90 in the typically developing children and ranged from .88 to 1 in the children with hearing impairment. These results confirm that the pre-arithmetic school readiness test has high reliability irrespective of whether it is administered on typically developing children or on children with hearing impairment.

Table 7.

Reliability of the pre-arithmetic school readiness test on typically developing children and children with hearing impairment.

	Cronbach's Alpha	
	Typically developing children	**Children with hearing impairment**
Visual open	.90	.93
Visual closed	.89	1.0
Auditory open	.86	.88
Auditory closed	.83	.90
Overall	.84	.90

Discussion

From the comparison of performance between the two groups of children it is evident that the typically developing children performed significantly better than the children with hearing impairment. This was seen for the overall scores and for all the auditory based questions. This higher score for the auditory based questions was seen for the total auditory based score as well as when the questions were sub-categorized as auditory open and auditory closed. In both groups the scores dropped for the auditory based questions, but this drop was more prominent for the children with hearing impairment. This is evident from the mean scores provided in Table 5.

Similar observations were made in earlier studies by Pau (1995) and Wood et al., (1983), Nunes and Moreno (2002), Swanwick et al. (2005). They too observed that children with hearing impairment performed poorer than typically developing children on the

tasks evaluated by them. Their participants faced difficulty despite the evaluation being done using written tests. Contrary to the above findings, Traxler (2000) observed children with hearing impairment to perform on par with their counterparts who had normal hearing. However, this finding was attributed to the purposive sampling of students who performed well. Hence, their findings cannot be generalized to all students with hearing impairment. Similar to the findings of Traxler, it was reported by Paranjape (1998) that children with hearing impairment could perform like typically developing children. This latter study however, made no mention if the tasks evaluated were grade appropriate. Despite the drawbacks of the studies by Traxler as well as Paranjape, their findings highlight that certain children with hearing impairment are capable of performing on par with their typically developing peers.

In the current study, in contrast to the performance on the auditory based questions, the total score on the visual based questions were not significantly different in the two groups. This suggests that all children in the early stages of their development are dependent more on the visual modality for concept formation even if the auditory modality is fully functional. There continued to be no significant difference between the two groups when the visual based questions were given with choices of answers (closed type). On the other hand, when the visual based questions were given with no choices (open type), there was a significant difference between the two groups. On the visual-closed task, the children with hearing impairment preformed slightly better than the typically developing children (Table 4, Figure 1, & Table 6). This indicates that on visual based tasks with options given, children with hearing impairment are able to perform at par with typically developing children but not when options were absent.

In consonance with the findings of the present study, Nunes and Moreno (2002) reported of improved performance of children with hearing impairment with the use of visual representation of the problems. Likewise, children with hearing impairment were found to outperform the young children in informal spatial pre-arithmetic tasks by Zarfaty, Nunes and Bryant (2004). As early as 1971, Erber reported that children with hearing impairment relied on visual cues for comprehension in spite of amplified acoustic cues being provided. This trend continues to be present despite the advances in technology resulting in children with hearing impairment using digital technology that is expected to reduce their dependence on visual cues. This highlights the need to stress on providing listening training for children with hearing impairment. This would help them cope in a regular school set-up where major mode of learning is through the auditory modality. Additionally, the use of more visual instruction in the regular classroom, where children with and study together, would be beneficial.

The findings of the present study indicate that when visual-closed questions are used, a ceiling effect was seen in both groups, resulting in no significant difference between the groups. Although the children with hearing impairment obtained similar mean scores for the visual-open and the visual-closed type of questions, the variability was larger for the former. The latter resulted in the participants obtaining perfect scores, thus resulting in no variability. This probably led to the significant difference between the groups only for the visual-open type of questions. Wilson and Antablin (1980) also observed that closed-set speech identification abilities in individuals with hearing impairment were far better than their open-set responses. Additionally, they noted that individuals with hearing impairment did not achieve 100% open-set word perception even when the material was presented at sufficient loudness.

The *performance of the children on specific mathematical concepts* revealed that children with hearing impairment had significantly more difficulty than the typically developing children in fundamental operations involving addition and subtraction, but not in number concept and shapes. This indicates that they have difficulty in grasping arithmetic concepts that are relatively more complex but are on par with the typically developing children on tasks that are less complex (number concept) or that can be easily grasped using visual cues (shapes). It is possible that the inability to use the auditory mechanism to the same extent as normal hearing children could have prevented them from grasping arithmetic concepts within and outside the classroom.

Hyde, Zevenbergen, and Power (2003) also reported of older children with hearing impairment, studying in grades 1 to 12, having difficulty in the use of analytical and thinking strategies to solve arithmetic word problems. Additionally, Epstein et al. (1994) found that limited auditory experience effecting short-term memory, was a factor for poor performance of college students with hearing impairment. Recently, Gowramma (2014) also reported that children with hearing impairment had more difficulty in carrying out fundamental operations that required higher order thinking. It was found that children with hearing impairment studying in grades 4 and 5 performed similar to their hearing peers in addition and subtraction, but performed poorer in multiplication and division. It was concluded that mathematical reasoning in children with hearing impairment was on par with hearing children but the learning process was slow. Similar observations were made by Meadow-Orlans (1980).

Swanwick et al. (2005) reported that findings from research studies between 1980 -2000 suggest that there is an average delay of 2 to 3.5 years in mathematical achievement in children with hearing loss. However, many of these children were reported to show similar processes as their hearing peers, confirming the suggestion of delay in mathematical development rather than a disorder or deviant development. Based on the above study, Swanwick et al. (2005) suggested that students functioning at lower mathematic levels may not have the opportunity to be exposed to the curriculum content at a higher level and therefore continue to perform poorly in content that requires the use of higher order analytical skills.

The presence of a hearing impairment and the ensuing cognitive problem could have hampered incidental learning that takes place in typically developing children outside the classroom. This has also been reported by Kritzer (2009) who suggested that a lack of incidental learning experiences could have led to the participants with hearing impairment aged 4 to 6 performing poorly on informal mathematical problems including word problems. The finding of the current study suggests that children with hearing impairment are unable to utilize this channel of learning. Further, factors such as school and medium of instruction were found to have no influence on the performance of children with hearing impairment. Thus, studies reported in literature indicate that in individuals with hearing impairment, higher cognitive factors influence arithmetic performance. From the findings of the current study and that reported in the literature, it can be construed that the difficulties in using higher cognitive functions in fundamental operations of arithmetic is present right at the initial formative ages and continues to persists later in life while solving word problems. Hence, the focus of intervention should be more towards compensating for the auditory input. As children with hearing impairment were able to utilize visual cues better than auditory cues (Table 4 & Figure 1), it is recommended that more visual based activities be used in preschools in order enable these children grasp such concepts. Training to make fundamental operations clear to children with hearing impairment should be incorporated in the teaching-learning process right from the preschool age. This could reduce the difficulties faced by them in arithmetic in higher classes.

From the findings of the present study, it can be inferred that the newly developed pre-arithmetic school readiness test that has high reliability is sensitive to detect the specific difficulties children with hearing impairment have in learning arithmetical concepts. This would enable planning appropriate remedial instruction for children with hearing impairment. The test can also be used as a guideline to decide on educational placement of such children by special educators or speech and hearing professionals. The developed test also could also be used as a tool to demonstrate to caregivers of children with hearing impairment regarding the importance of providing their wards training prior to admission to school. Narayansamy, Ramkumar, and Nagarajan (2014) noted that mother of children with hearing impairment in rural south India believed that once children with hearing impairment were fitted with hearing aids they could go to regular schools without further intervention. Tests such as the 'Pre-arithmetic school readiness tool' could be utilized to highlight to them the need for special intervention to prepare their children for regular school. Further, the developed test not only throws light on the

arithmetic performance of children with hearing impairment, but also on the performance of typically developing children.

Conclusions

The comparison of performance of the two groups (typically developing & children with hearing impairment) for the sensory modality (visual & auditory) and type of questions (open & closed), revealed a statistically significant difference. This difference was seen for the scores of auditory stimuli, open type of questions and closed type of questions. However, the performance of the two groups did not differ significantly for the visual based stimuli. Within the visual based tasks, the two participant groups did not differ significantly for the closed type of questions but did for the open type. When the scores were compared within each of the participant groups, the pattern of difficulty varied for the categories studied. This indicated that the level of difficulty varied depending on whether they had hearing impairment or not. Further, children with hearing impairment performed at par with typically developing children on tasks such as number concepts and shapes. On the other hand, they performed poorer than the typically developing children on fundamental operation of addition and subtraction.

Thus, it can be construed from the finding of the present study that though children with hearing impairment wear state-of-the-art hearing devices to compensate for their hearing loss, they continue to have difficulty in carrying out auditory based activities. Hence, while planning auditory based activities, special care is required to make the signals audible to the children with hearing impairment. Additionally, intensive listening training is recommended to enhance their listening skills. This along with the use of visual representation of the mathematical problems would enhance learning of mathematics in these children in their early years of development.

The study provides insight to the specific strengths and weaknesses of young children with hearing impairment in mathematics. The 'pre-arithmetic school readiness test' was found to be sensitive in tapping the difficult areas of pre-arithmetical concepts in children with hearing impairment. Such tests would help in planning appropriate remedial instruction programs for children with hearing impairment and in selecting educational placement. However, the present study is limited to only one regional language. It is recommended that similar tests be developed and validated in other languages.

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What is Special in Special Education from the Inclusive Perspective?

Abstract

The article offers insights into the discussion of the terms 'special' and 'inclusive' applied as concepts to define educational inclusion. By analyzing three cases where a school's routine was followed, it was possible to interpose discourse and practice to highlight how contradictions in educational practices are constituted in the micro level of classroom reality. Data were collected through interviews, video-recordings and school documents in two Early Childhood Education Schools in Brazil. Through a qualitative epistemology analysis, the key findings pointed to contradictions regarding the role of teachers towards the implementation of pedagogical practices and the special education support actions. We discuss the need of reconsideration of what is understood by special education system and argue that human development is the key to develop inclusive practices.

Keywords: Human Development, Educational Inclusion, Special Education, Early Childhood Education

Introduction

UNESCO has been a forerunner in the global turn tc wards more inclusive approaches in education sinc the Salamanca Declaration (UNESCO, 1994), leadin up to the organization's recently published guideline "Inclusion from the start" (UNESCO, 2014) and placin inclusive education largely attached to a social justic perspective in educational policy. Previous studies o inclusion have addressed either in-depth interpreta tion of inclusive education, presenting reviews of ir ternational trends (Ainscow, Booth & Dyson, 2006 proposing deep changes of how research on inclusio should be carried out (Messiou, 2016), or underlinin the possibility of different and distinct conceptualiza tions of inclusion. Slee (2014) affirmed that, histor cally and internationally, "exclusion is an establishe tradition in the modern invention of schooling" (p.1(and that inclusion is not an evolution of previou models, but rather an entirely new proposal for o ganizing society (Slee, 2006). Therefore, inclusion is paradigmatic milestone where societal rather than ir dividual transformations are expected, and in whic ideological principles and pragmatic orientation hav struggled to find a balance and overcome its contra dictions (Croll & Moses, 2000; Farrell, 2001).

However, school practices do not necessarily follow the speed with which changes in political declarations and paradigmatic concepts happen (Forlin, 2010; Sailor, 2010), resulting in contradictions between new conceptual understandings of school organization and the practices accomplished in reality (Ainscow, Booth & Dyson, 2006; Farrell, 2001). In other words, discussions at the macro political and conceptual research level are not immediately or fully reaching the micro classroom spheres, showing that daily classroom practices seem to be conjugated into the net in which the discourse has been signified (Hujala, 1996; Rutanen, Amorim, Colus & Piattoeva, 2012).

Accordingly, the purpose of this study is to investigate, within the classroom context, the implementation of special education practices concerning inclusive education, and how the concepts of 'special' and 'inclusive' education are signified in early childhood education (hereafter referred to as ECE).

Research context

This research takes place in Brazil within the tensions between the inclusive policy and the transversal modes of special education. Onboard with the project of putting inclusive international policies into practice locally, Brazil's Ministry of Education and Culture have emphasized that an inclusive

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model of special education is destined to attend to a public of people with disabilities, creating a transversal mode of education that functions inside the mainstream school (Brasil, 1996; 2009; 2011; Ministry of Education and Culture, 2013b). The special education system in Brazil is responsible for providing services (e.g., individual assistance, continuing education for teachers), resources (e.g., adaptation of materials, development of alternative tools to allow access to activities), and strategies (e.g., curriculum reformulations) to overcome the barriers that prevent the full access of people with disabilities to equal education (Brasil, 2009). Within its scope of actions, the special education system (Brasil, 2011) identifies student needs, elaborates pedagogical plans and organizes practices and pedagogical resources to fulfill the aims of special education.

However, beyond the aim of promoting access and participation in mainstream schools, Brazilian inclusive education policy raises the discussion of the right to be different, a right to uniqueness (Mantoan, 2008) and that diversity belongs to the human condition, initiating a discussion about the development of children with disabilities in school settings (Mantoan, 2015). In this sense, the meaning of human development not only grounds the overview of the educational processes, but also delimits the objectives of pedagogical practices and the role of assessment, seeming to be a key element and a common aim in both in special education and inclusive education.

Special education through the lens of human development

The concept of 'special education,' according to Pessoti (1984), Januzzi (2004) and Mazzota (1987; 2005) clarifies the relation between 'special' and 'abnormal.' The term 'special' is placed bilaterally in the definition of something (in this case, education) developed to attend the needs of someone that is different from the majority, defining not only the structure created but also the person for who that social structure attends to (e.g., the special school, for special children). In this case, the abnormality defines the needs, and the needs defines the actions/structures and the epistemology grounding the reasoning belongs to a Cartesian and Positivist theoretical background, which considers abnormality everything that does not belong within the curve of normality (Mendes, 2006).

Within this theoretical framework, human development is treated in the same way as natural phenomena, where biological events are considered the markers of development. Observable differences (in behavior and\or in the body) are interpreted as transformations, which are identified in different age groups, designated as phases of development, and used to characterize the standard path of human growth (Bee, 2011; Gesell & Amatruda, 2000; Garcia, 2003; Junn & Boyatzis, 2012). This procedure has created an understanding of human development following universal path, with clear and unchangeable signs to evaluate its course.

Despite paradigmatic changes pointing to a broader conceptualization of human development, these individualistic frameworks are still present and ground perceptions and practices (Collares & Moysés, 2010). The understanding of a universal path of development and the ontological connections to the standardized evaluation of 'normality' that 'special education' carries implicates that this 'abnormal' development demands another way of learning, or even another understanding of what learning will be for that individual (or group). Consequently, there is a necessity to create different institutions where that differentiated process can occur. The process of transformation relays in the individual and in its possibility to adjust into the natural flow of mainstream social life.

Inclusive education through the lens of human development

In turn, the term 'inclusive education', officially appeared in documents in the late 1990s referring to access in school (Mendes, 2006; Sailor, 2002; Slee, 2012; UNESCO, 1994). It is grounded on a moral doctrine, which the main idea is that all people should have the same social rights regardless of individual differences (Berhanu, 2010; 2011; Mendes, 2006) and underlies the claim that, regarding disability, the absence of rigorous decision-making processes can lead to exclusion in special education environments (Berg & Schneider, 2012). 'Inclusive education' stems from the assumption of human development as a phenomenon resulted from a social construction, and therefore, is not intrinsically individual.

Contributions to this view are found in the Historical-Cultural Theory by Vygotsky (1928-1934), which postulates the social nature of human development (Vygotsky, 1991) and the inseparability between emotion and cognition, valuing individual experience, and revealing the uniqueness of the developmental process (cf. Gonzalez-Rey, 2016). According to Smolka and Nogueira (2002), human development happens at the same time and dimension in what it is constituted as the social surrounding. This collective experience defines the

social nature of human development by emphasizing how the individual's "organic dimension is impregnated by the culture and marked by history" (Prestes, 2012 p.80). It is therefore necessary to examine social constructions within schooling and learning practices instead of looking exclusively towards the individual student's achievements. Thus, "the social relation in which the subject is involved explains his way of acting, thinking and relating" (Smolka & Nogueira, 2002, 81).

However, to this day, the way inclusion is implemented varies depending on how policymakers and practitioners understand inclusion and connect it to their daily social environments (Turnball et. al, 2002), seeming to be experienced in distinct ways in multiple social frames and contexts (e.g., Mäkinen & Mäkinen, 2011; Gao & Mager, 2011). Evans and Lunt (2002) explore in their study the expressed difficulty of teachers to translate the national policies into practices, especially when there is a gap between what is foreseen for the praxis (a student-centered approach) and the evaluation (a standardized system). For the authors, the key to understand the process remains on the investigation of teacher's perceptions and actions towards developing inclusion.

Previous studies focused on teachers' perception identified that teachers that received Special Education Training have more positive attitudes toward including students with disabilities (Varcoe & Boyle, 2013). Accordingly, teachers with more positive attitudes towards inclusion were reported by their pupils to provide environments with higher levels of satisfaction and cohesiveness and lower levels of conflicts, competitiveness (Monsen, Ewing & Kwoka, 2014). However, beyond exploring teachers' perspectives, which according to the mentioned studies are the starting point of the inclusive practices, there is a need to deeper investigate the processes in which these perceptions are materialized, transformed into actions.

Considering all, and understanding that the classroom is where the inclusion happens, this study offers a qualitative microanalysis of learning processes by addressing the following research questions: What are the meanings teachers give to 'special' and 'inclusive' education through the classroom practices or, in other words, how are the 'special' and 'inclusive' manifested in the daily classroom practices? How does the 'human development' perspective promote inclusive pedagogy?

Methodology

This study utilizes the Network of Meanings framework (Rosetti-Ferreira, Amorim & Silva, 2004) as a methodological approach; a perspective drawn from the studies of human development in early childhood settings introduced by Rossetti-Ferreira et al. (2004). This framework assembles personal, relational and contextual processes embedded in and constituted by a historical social-cultural framework, placing focus on the interactions and meaning-making processes.

The Network of Meanings is based on a number of theoretical works, i.e., Bioecological Development (Bronfrenbrenner, 1996); the notion of complexity (Morin, 1996); the Historical-Cultural Theory (Vygotsky, 1991; 1996; Van der Veer & Valsiner, 1991; Valsiner, 2000; Wallon, 2007), and the dialogical conceptions of Bakhtin (1979; 1992), and it has been used in qualitative work within the field of developmental psychology (Almeida, 2014; Amorin 2013; Colus, 2012; Ferreira, 2013; Moura; 2012; Moura & Amorim, 2013). The contribution of Network of Meanings to this study relies on the structure that assembles a "multiplicity of possible meanings, points of view, affectionate and power relationships as well as discursive practices contain and promote deviation, dispersion and contradiction" (Ferreira-Rosetti, Amorim & Silva, 2006, p.283). The key points of this framework are the access to multiple factors (i.e., individuals, micro and macro social contexts) and the relational way by which analysis is conducted (i.e., even contradictory dialogs are explored), exploring the interrelationship between these diverse features of human development. To get at this interrelationship requires the process of immersion in the field and the assumption of an active role for the researcher that grounds the design of the study. It then results in a construction of methodological steps that remains open to different tools and resources to collect the data and consider multiple perspectives on the process of analysis (Ferreira-Rossetti et al., 2006).

Taking into account all the above and aiming to develop a work which indeed addresses the complexity of the phenomenon of human development, we structured the research as a case study carried out in two schools. According to Yin (2010), this kind of case study research aims to identify the existence of a phenomenon and explore how it happens and how it relates to its social context.

The schools

The two schools upon we studied belong to the Federal Public Educational System (School A) and to the Municipal Public Educational System (School

B), both located in Minas Gerais State, Brazil. School A offers educational services for over 900 students from ECE (3 years old) to the 9th grade (15 years old). School B offers daycare for 990 children from six months to six years old.

The ECE curriculum in these schools follows the national curriculum (Ministry of Education and Culture, 2010) and regulatory documents (Brasil, 1996; 2000; 2005; 2011), and the practices are developed under a broad view of the social-interactionist theoretical perspective (La'Taille, Oliveira & Dantas, 1992).

In School A, besides the classroom teachers and the gymnastic teacher, the early childhood department includes a special education teacher, a part-time social worker, a psychologist, and a class aide as members of the staff that work directly with children and families. Children attend the school only part-time (in the afternoon) in classes of 15 to 19 students (two of them were children with disability). The teacher's work is organized in a weekly schedule established by the collective of teachers in 16 lessons of 60 minutes each. The curriculum of School A implements pedagogical practices in five spheres of child development: oral and written language, mathematical reasoning, the body and its movement, artistic language and emotional development. Teachers have the freedom to design their own strategic planning and class activities. The school curriculum carries a section devoted to explaining the special education services, specifying two modalities: (1) pedagogical planning with the teacher, and (2) extra individual tutoring outside the school day.

In School B, children attend daycare from 7am to 6pm. Classes are composed of 25 to 30 children (one child with disability in the group), and the teacher's schedule is defined by the headmaster of the school according to a work agreement of 30 hours per week. Teachers and children count with a full-time aide, and an extra aide in case there is a child with disability in the class. This school's curriculum consists of a guidebook where teachers can find instructions to elaborate their daily plans. Special education is mentioned "as a right to all children with disabilities" in accordance with the Law 9.394\96 of Bases for National Education (Brasil, 1996), in which the service of special education, as a constitutional duty of the State, begins at age zero to six years old as part of ECE. Therefore, School B provides a special education teacher to develop individual activities for students with disabilities. Planning is based on observations and an evaluation made by the special education teacher during her time with the child.

Participants

Participants were selected using a purposive sample to provide information that is relevant to our research questions. Therefore, the participants included three class teachers (two from School A and one from School B), three children with intellectual disabilities that are here addressed as *target children,* and the students of these classrooms (62 children in total).

The target children (with assigned pseudonyms) were all diagnosed with Down Syndrome. Ivan (School A) is a three-and-a-half-year-old boy. Ignacio (also from School A) was a four-year-old boy and Amanda (School B) was a three-year-old girl. Both teachers from School A had a master's degree and thirteen years of experience. In School B, Amanda's teacher had one-year-training in special education and had been teaching children with disabilities for five years.

Data Collection Procedures

Data comprised teacher interviews and student observations registered through video-recordings and field diary conducted by the first author. The interview is perceived as a moment of social interaction, bringing up representative criteria, and, thereby, showing both objective (e.g., concrete facts and objectives), and subjective nature (e.g., attitude, values, and beliefs) of the discursive data (Minayo, 1996). Children's observations were carried out through video recordings, which have been used as a pertinent and adequate tool on many studies with children (Carvalho, Branco, Pedrosa & Gil, 2002; Pálmadóttir & Einarsdóttir 2016; Pedrosa & Carvalho, 2005; Rossmanith et al. 2014;). The videos allow us to analyze nonverbal communication and subjective experiences of the children, which are both considered to be important to human development (cf. Trevarthen & Aitken, 2001).

Interviews. with the classroom teachers were conducted with a semi structured format and consisted of 35 to 40 minutes of dialog. The content of the interviews concerned the teacher's educational background, theoretical perspectives, prior experiences, opinions, and perspectives about the inclusive educational environment, special education, and the schooling processes of children with disabilities. The dialogs were audio-recorded and allowed for a reflexive interview (Szymanski, 1998; 2004) where the structure during the two interview times (before and after observations) provided a dialectical dynamic between the participant and the researcher.

Observations. were conducted once a week with a duration of 30 to 50 minutes per day during the entire school year of 2014 and recorded on video. The focus was on target children with minimal interference in the activities that were taking place. After collecting the material, part of the videos had to be discarded either because there were images of children from another classroom, which parents were not aware of the research, or because it had scenes that exposes children's intimacy, for example using the toilet. The total amount of video recordings from all target children was 2422 minutes[1], and they mainly revealed different aspects of the target children's participation in the school context. For supplementary data, we utilized the plan book documentation produced by the teachers and first researcher's field diary. The pedagogical plan books were private and unofficial journals that belonged to the teachers, lent to the first researcher during the last month of the school year and returned to the teachers on the last day of school. In these books, teachers documented their pedagogical methods and materials to develop practices with children and evaluation procedures, allowing a closer look into their ideas concerning schooling process and pedagogical aims of specific activities.

Ethical issues

This research respects and fulfills all ethical criteria for research with human beings. Procedures described in this paper are part of doctoral-level research that was approved by the National Committee of Ethics in Research with Human Beings, through the University of São Paulo, Brazil. Participants were aware of and in agreement with the use of the information presented herein, teachers and the parents of the children participation on the study signed the terms of free and enlightened permission.

Analysis

All interviews were transcribed, yielding 24 single-spaced pages of text. Interviewees were numbered as participants 1–3 and any use of direct quotation of the transcribed material will identify the participants by 'atp' code, meaning 'according to participant' (e.g., quotes by participant 1 will say "atp1"). The data were content analyzed, by a four-step coding procedure (Corbin & Strauss, 2008a; 2008b), which resulted in a systematized categorization of teachers' discourse. In parallel, we analyzed the video recordings by the following two-phase process: (1) contextualization and categorization of the scenes, meaning that we divided the videos into episodes according to the type of activity or the focus of the dynamic. This process allowed the identification different elements of the pedagogical praxis. And, (2) the selection of specific extracts to subject to microgenetic analysis (cf. Goés, 2000) of dynamics.

Accordingly, we also considered elements from the school curriculum and teachers' personal pedagogical plan books as the supplementary data, respecting the theoretical assumptions of the Network of Meanings's approach that presents a view of discourses as inseparable from their settings. This data was analyzed by content analysis, used as a way to contextualize the teacher's interviews and our analysis of the video.

Results

We found our findings from the interview analysis fit into four main categories: (1) Role of regular school for children with disabilities; (2) Learning process of children with disabilities; (3) Teacher's training in special education; and (4) Teacher's understanding about disability. We focused on data from the first two categories to allow for a deeper exploration of the research questions of this article. From the video-recordings, during the process (1), contextualization of school's practices, six categories of daily routines emerged. The scenes revealed the context, the type of pedagogical approach and the amount of situations in each school, as illustrated in the table 1 below.

Through the categorization of video-recordings, we identified that individual classroom activities (i.e., children had to perform a specific guided task and there was an individual result) were the most common type of daily routine implemented in all schools. Therefore, we explored this category more deeply and continued to the microanalysis of relevant episodes. The results from the step (2) of the video-recording microgenetic analysis pointed that 53 episodes were classified as individual activity in the classroom, and were described by five aspects: Number of children involved; number of adults involved; type and availability of materials; type of activity; and, adults' actions during the activity.

[1] In school A, 23 sessions of data collection were conducted for case 1 and 25 for case 2. In school B, 18 sessions were conducted entirely.

Regarding the number of children and adults involved, in School A Case 1, the individual activities were conducted by one teacher, two aides and all 19 children, while in Case 2 of the same school there was one teacher, one aide and 18 children.

In School B, one teacher and two aides conducted all the individual activities with 25 children. Teachers and aides presented and conducted individual activities with the entire classroom, meaning that there weren't divisions of different activities for groups of children, rather they all did the same task at the same time.

Table 1.
Categorization of the school's daily routines

Name of the categories	School A, case1	School A, case2	School B
1. Individual activities in the classroom	19	22	12
2. Group activities in the classroom	16	10	7
3. Free play	17	9	8
4. Eating	2	2	4
5. Individual activities outside the classroor	9	8	19
6. Group activities outside the classroom	6	8	5

It is important to mention that in School A; the class aides are undergraduate students in teacher education. In school B, the aides are professionals with a higher educational (academic or vocational) degree in teaching. Regarding the availability of the materials and its use during the individual activities, we present the results in Table 2.

In School A, case 1, we identified drawing, coloring, collage, and writing tasks as the types of activities. In general, children would initiate the activity by choosing places to sit. The teacher or class aide would then deliver materials. In case 2, drawings, bricolage, painting, playing with clay, and writing tasks were more common. Children in case 2 had pre-established places to sit, organized by the teacher. The teacher delivered the materials. In School B, the activities were coloring, cut and collage, and playing with clay. The class aides were responsible for delivering the materials, and since there were not enough tables for all children, they were guided to take a place on the floor.

Table 2.
Type and availability of materials

	School A, case 1	**School A, case 2**	**School B**
Materials	Paper A3, crayons, penc ballpoint pen, paint a glue	Paper A3, crayons penc paint, glue, teared pa and plaster.	Paper A4, magazines, penc glue and tared paper.
Type of storage	Cabins	Shelfs	Locked cabins
Display	Free access to children	Available with teacher's pervision	Available with teacher's pervision

The mainstream school and children with disabilities

The data revealed how the teachers saw the purpose of mainstream school for the children with disabilities. Their views were in accordance with the Special Education and Early Childhood Education National Guidelines (Ministry of Education and Culture, 2006; 2013b) and the school's curriculum when emphasizing the school's role to "promote the learning process" (atp2) and to "allow him to socialize and promote an active participation" (atp1). Teacher also associated the purpose of mainstream school to the promotion of "cognitive development of the child with disability" (atp1) and to "improve his (student's) capacities, mediate his knowledge (atp2).

By affirming that development (in a general understanding of the term) is an important element of the school's role, teachers revealed that from the macro level of policies and curriculum planning, the structuring idea of inclusion is already part of their discourse. Furthermore, teachers also acknowledged that promoting the participation of the child in his own way, planning classes starting from the child's own knowledge, and providing opportunities for children to manifest

themselves were the aims of schools in the context of inclusive education.

However, regarding the attention to the special educational needs (SEN) that a child with a disability might require, the interviews raised different perspectives that carried a less student-centered approach. Teachers claimed that activities should not be different from the rest of the group: "what I do with children, I also do with Amanda (...) she doesn't have any specific orientation" (atp3); and that overall pedagogical planning happens collectively with other teachers, which can include the child with disability.

Table 3.

Teachers' actions during the activities in episodes of the category "Individual activities inside the classroom"

Teacher's actions	**School A, case1**	**School A, case2**	**School B**
Explaining the activity to all	x	x	X
Organizing the classroom	x	-	-
Going around the class assisting individuallywhen he runs outside the classroo	x	x	-
Going after the child with disability	x	-	-
Giving orientation to the class aide	-	x	-
Observing children while the activity	-	-	x
Playing with children	-	x	x
Holding the child with disability on her lap	x	-	x
Calling the attention of the children	x	x	x

In the table 3, the (x) represents presence and (-) represents absence of specific action.

Table 4.

Aides' actions during the activities

Aide's actions	**School A, case1**	**School A, case2**	**School B**
Conducting individual intervention with the child with disability	x	x	x
Organizing the classroom	-	x	x
Going around the class assisting individually	x	x	-
Going after the child with disability when he runs outside the cla room	x	-	x
Reading books to the child with disability	x	x	-
Mediating interaction with peers	x	x	x
Playing with children	x	x	x
Holding the child with disability on her lap	x	-	x
Calling the attention of the child with disability	x	x	x

In the table 4, the (x) represents presence and (-) represents absence of specific action

Special education activities were evidenced by the specific support of special education teachers during the collective planning (i.e., discussion with all the teachers about the school's routine and pedagogical activities developed), and in the activities that special education teachers developed part-time (extra-class hours) with the child. It is important to highlight that, while the teachers from School A emphasized the help that special education teachers and psychologists provided for the collective pedagogical planning, the teacher from School B affirmed that they did not have any contacts with the school's special education department.

The interviews also indicated that teachers understood their role in learning processes as mediators who articulate actions for the child and guide them the appropriate uses of materials. However, they also pointed the need for an aide to help with the implementation of lesson plans.

The interviews also portrayed teachers' understanding of the learning process of children with disabilities. Teachers expressed that each child has his/her own learning process. Teachers identified that children with disabilities learn at a slower pace, or within a rhythm that is different from the rest of the class, needing help during the schooling process such as to "learn the school routine" (apt1), to "amplify the child's vocabulary" (apt1), and "to improve communication" (apt3).

Teachers also revealed that the children with disabilities learned from and with their peers, attributing a great emphasis on activities where peers can interact and be actively involved in the learning process, such as when they "learn by listening to other children" (atp2),or "when they are interacting with other children and transforming that experience in something valuable for them" (atp1). Overall, teachers seemed to have a comprehensive understanding of the social justice ideology of inclusion (Berhanu, 2010; Berg & Schneider, 2012; Smith, 2012; Young, 1990), presenting a clear perspective about its premises and acknowledging the responsibility of mainstream school to promote human development. Nevertheless, regarding the implementation of special education within an inclusive perspective, they presented distinct ideas about pedagogical actions and the role of each professional in the schooling process. While teachers recognized their active role in the learning processes and the importance of a multi-professional team, classroom practices reflected the tradition of exclusive special education, where differentiated activities are conducted outside the classroom by a special education teacher.

Class activities

The video analysis revealed how the schools implemented inclusive practices, and in relation to the themes raised with the teachers' interviews, three core issues emerged: (1) The function of class aides; (2) The relation between the type of activity and the time to execute it; and, (3) A lack of promoting peer collaboration.

The class aides conducted, mediated, and intervened pedagogically for the majority of the individual activities, often playing a more active role in the learning process for the children with disabilities than the classroom teacher did. The addition of extra adults to support the schooling processes in classrooms where children with disabilities were located was a particular consideration addressed by law in Brazil (Brasil, 2009). However, the teacher was still the one who has been seen as responsible for mediating and assisting these children during the activities in the classroom. What we saw through the analysis was that the teachers' focus was mainly on conducting the class instructions, assisting children in general, but designating one-on-one mediation to the class aide. This was especially visible in School A, where the class aides were appointed to assist the children with disabilities. While in School B, even though there was no specific designation for the class aide, they ended up largely fulfilling the same function, as a private assistance for the child with a disability.

Concerning the relation between time and activity, we observed that the activities were given at the same time for all students, and it was the main group of children's rhythms that regulated the daily routine. Accordingly, the teachers enabled children with disabilities to perform the tasks in their own rhythm by allowing for specific goals and performing a special pedagogical intervention for them. Nevertheless, all the flexible possibilities were restricted within the school's structure by limiting the activities' pace into a pre-established week schedule. Therefore, even acknowledging the slower rhythm and supports which the child with disability needed, it was still a homogenous perspective that defined the daily routine.

In terms of peer collaboration, peers contributed to the learning processes of the children with disabilities, according to the teachers' interviews. The teachers raised that the children with disabilities learned from and with the peers in different ways. According to the video analysis, however, peer interaction was limited by the class aide in the majority of the scenes. Class aides placed themselves in between the children with disabilities and their peers, creating a physical barrier to

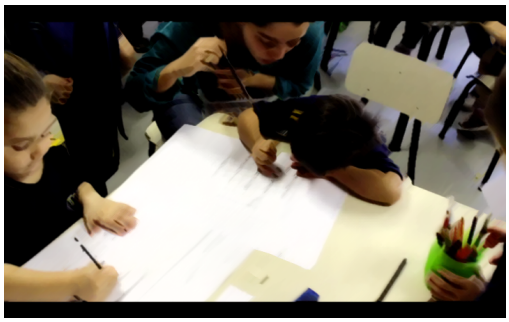
peer collaboration. Children's attention was called to their own differentiated activity rather than peer interactions.

Children with disabilities as a part of an inclusive setting

Next, we illustrate the findings depicted above by presenting an extract of the class routine School A, case 1. The scene starts with the teacher explaining the next activity to the group of 19 children. They are all sitting on the floor in a circle. Aldo (target child) is sitting on the class assistant's lap. The activity consists of identifying, in a board of letters, the specific ones that are used to write the name of characters of the story that the teacher read. Once the children have identified the same letters in the board, they color them, highlighting the word. For this task, each child received an A3 sheet of paper, previously prepared with all the elements for the activity. Children are told to find themselves a place to sit and to wait for the teacher to deliver the pencil and the crayon that they will use to color the letters. The task had the same pedagogical goal for Aldo, but with lower level requirements. Instead of recognizing the written words independently, he had to identify individual, unrelated letters shown to him by the aide. After the teacher's explanation, all children sat in their places at the tables (each child choose their place). The class aide sits next to Aldo (marked with the arrow in figure 1). Children wait for the teacher to give them the activity. While waiting, all children engage in their own processes of interaction (e.g., playing with the pencils or pretend play), including Aldo.

Figure 1.

Children engaging in pretend play



When everyone gets their materials, they start doing the activity independently. Aldo has full-time assistance that controls how he is going to do the activity by holding the pencil away from his hands and conducting the process with auxiliary materials (e.g., plastic letters).

Figure 2.

Aide taking the pencil from Aldo's hands

Aldo looks towards other children (special attention to the one right in front of him); looks back at the class aide and tries to take back the pencil. He grabs the pencil from the aide's hands, looks to the peers in the table and colors the letters (randomly). The aide calls for his attention and gets hold of the pencil again (illustration with figure 2). This dynamic is observed 13 times throughout four minutes and after approximately four and a half minutes, Aldo stands up and turns towards the blackboard, leaving the table. He walks towards the blackboard, grabs a chalk and draws a letter (letter C) as illustrated with figure 3. The entire process last for 12 minutes.

The teacher's plan book had remarks about the child's behavior on this specific day, reporting "lack of interest in the activities that the class is doing" (atp1) and "continuous behaviors of disengagement with the group" (atp1).

Figure 3.

Aldo writing on the black board

Concerns with Aldo's "difficulties concentrating and socializing like other children" (atp1), also appeared in the child's semester evaluation, justifying the full-time presence of a class aide in the next school year. However, when we micro-analyze the episode, it is possible to see that the teacher could not always notice what was happening in reality once is the aide that conduct the activity. This short extract, which is one of the 23 scenes in which the activity is conducted exclusively by the class's aide, raises questions about

what items and criteria are involved in the evaluation process, and how the teacher could have noted the specificities of Aldo's learning process if it was the aide who was the most involved with him.

Discussion

The observations raise a number of different questions, but none of these is meant to discredit the work of teachers or institutions, or to affirm that their practices are not inclusive of the children with disabilities. Nevertheless, we would like to point out contradictions that are evident if

discourse and practice are compared, shedding light on the challenges that the conceptual understandings of inclusive education, special education, and human development involve. In this sense, teachers' discourse and practices are distinct from each other in four very crucial ways: the role of teacher towards the implementation of pedagogical practices, the special education support actions, the focus on human development, and the peer's participation on the learning process of the child with disability. These distinctions lead us to affirm that ideals and perceptions that teachers expressed (interviews) are not always put into practice in reality (the video of daily, routine observations).

In the videos, teachers did not lead efforts to provide differentiated instructions for children with disabilities, even though they expressed being in charge of their inclusion in their interviews as government documents on inclusion suggest they should be (Brasil, 2009; 2011; Ministry of Education and Culture, 2013b). The class aide, who was only supposed to be part of a support action from the special education, became an essential element to providing schooling for the children with disabilities, fulfilling the central role of the teaching process. Special education, which under the perspective of the inclusive education is characterized as a support assistance modality within the mainstream schooling process (Brasil, 2011; Ministry of Education and Culture, 2013b), is, in reality, transformed into a parallel schooling process. Inclusive education becomes, in practice, the system that places children with disabilities in mainstream classroom along with others, but still considers them as demanders of a specific (parallel) process.

Another issue regarding special education supports relates to the collective planning between the classroom teacher and special education teacher. In the observed reality, the special education teacher is planning with the classroom teacher, but it is the aide (sometimes non-qualified) that is implementing the actions. This system compromises the evaluation of the child's developmental process, which is the central element for the schooling process, according to the teachers' interviews. Teachers' evaluation, which composes the process of assessment of the children's development, despite using qualitative resources, was still comparative and homogeneity-oriented, which leaves out space for individual ways of learning and the uniqueness of human development, as emphasized in the interviews.

Development "happens by complex processes of interaction within a mash of semiotic elements dialectically inter-related" (Rossetti-Ferreira et al., 2004, 23). Therefore, what defines the course of development within the schooling process is not a set of comparisons between children based on a curve of normality, but the complex and unpredictable ways in which individuals will construct their net of interactions. Observing this process requires close observations and interactions with the child by the evaluator. Therefore, to maintain a coherent approach, the evaluation of child's development should involve the person that is actively participating in the entire process, in this case the aide, and cannot consider any other parameters besides the individual's own milestones, respecting the student-centered perspective that teacher's discourse pointed.

Following this reasoning, we still have to point out the incoherence between the belief that peer interaction promotes learning process and reality, where peer interactions are limited or restricted during individual activities in the classroom. In the scene that we shared previously, Aldo had the peers in front of him as a reference and he was expected to be allowed to perform the task as his peers were. Instead, the class aide interpreted his interactional behavior with his peers as purely indicative of a lack of concentration. Peer interaction has a significant impact on the regulation of behaviors (Carvalho, Branco, Pedrosa & Gil, 2002; Carvalho & Pedrosa, 1998; Guralnick, 2002; Império-Hamburger, Pedrosa & Carvalho, 2009), leading to numerous kinds of learning processes, as studies already have shown (Corsaro & Molinari, 1990; Corsaro 2003; 2005; Schilling & Clifton, 1998; Verba, 1994).

This scene shows that there is an expectation of a specific behavior for the engagement in the activity to be recognized (e.g., paying attention to what the adult says, following the given instructions). If not, the moment will be judged as unsuccessful (e.g., did not achieve pedagogical goals, did

not complete the task) and the child labeled negatively (e.g., having problems to concentrate or to follow the activity). Participation cannot be restricted to attending specific expectations academically recognizable, otherwise engagement processes will not fully respect the individuality of learning experiences. In this specific case, we interpreted that the child maintained his interest in the activity for twelve minutes; he tried thirteen times to take control of the pencil and looked seventeen times to the peer's work. He walked out from the worktable when he saw a possibility to perform the activity (draw the letter) on the blackboard and by applying a different strategy; he found a way to gain control.

Measuring a student's participation and inclusion involves balance between respecting a child's individual developmental process (including a personal way of experiencing being in the world with a disability), the offer for specific support for the child's learning process, and the academic duties that a school has towards all its pupils. The support for pedagogical practice should not cross the line of becoming the teaching practice itself to avoid creating exclusion despite the discourse or curriculum proposal. On the other hand, the absence of specific learning supports for the purpose of full inclusion can also compromise the effective participation of a student by not providing what it necessary for the child to take part in the process and activities.

Within a developmental perspective, there is no space for 'special' as a 'different' or 'parallel system' (as the concept was originally constituted). The recognition of subjectivity and multiplicity in learning paths as inherent to the process of human constitution (Rossetti-Ferreira et al., 2004; Branco, 2004), places pedagogical practices in an individualized, student-centered context, where the disability is considered a human condition which has to be accepted and acknowledged as one more way of learning, developing, and being.

Special education trajectories are defended by those that believe in a parallel system and whose concept of human development is tied in the idea of a clear, well-defined, universal process, which when applied to the educational field becomes an argument for standardization. This creates the inevitable exclusionary system described in Slee's work (2011, 2014). What we propose here is a reflection over the adoption of a wider perspective towards human development within schooling processes. This perspective should incorporate the complexity, the diversity, and the contradictions of humanity (Rossetti-Ferreira et al., 2004). Therefore, we understand that the more you consider a practice 'special,' the less it becomes inclusive, because these categories belong to opposite epistemological beliefs even if they are placed together in the current educational context.

Beyond highlighting the importance of a more reflective practice, the implications of this study relay on the possibility to discuss about the role of school and the necessity to transform its structures and the curriculum in order to effectively carry out in practice the actions foreseen in discourse. In this sense, this study evidences that as well as the investments in teachers training in special education, it is necessary to rethink the school, the organization of its space and time towards the promotion of more qualified interactions and the respect of different learning rhythms.

Evidently, the limitations of this study are diverse. We recognize the singularity contained in the case study and its limitations towards generalizations. The research design prioritized a subjective view of the investigated phenomenon within a specific social context inside Brazilian reality, restricting the applications for our findings. The focus of the study remained in the inclusion process of children with intellectual disability, which implies specificities that are different from other conditions of disabilities and the elements analyzed do not represent the wholeness of the school environment, but rather a situated fragment of it. However, we believe that core elements of social phenomena reside within the singularity of each participant, and presenting these considerations, we intend to explore how the misunderstanding of concepts like inclusion can be implicitly present in daily day life in educational scenarios. We believe that, until human development is not the center of all educational curriculum, proposals, and practices, conceptual misunderstandings will always be present. Therefore, future investigations focusing on applying such concept in educational practice are yet necessary.

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