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**AN APPLICABLE PHYSICAL ACTIVITY TRAINING
PROGRAM AFFECTING MOTOR SKILLS: THE CASE
OF TABLE TENNIS PLAYERS PARTICIPATING IN
SPECIAL OLYMPICS (SO)**

ABSTRACT OF DOCTORAL THESIS

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INTRODUCTION

This study sought to discover the ways and extent by which a special training program affects the improvement of table tennis skills of SO (Special Olympics) participants.

This study designed to improve four motor skills: balance, hand-eye coordination, power regulation and coordination, of people with intellectual disability and Physical Disabilities. Testing the effect of the training program on four skills was conducted by comparing an experimental group with a control group. Also, semi structured interviews were conducted and analyzed thematically. The statements from the interview were used for structural questionnaire.

The present study explored whether a special training program for Special Olympics athletes, which was built on the principles of working with people with intellectual disabilities, can actually improve motor skills in adulthood.

Research background and rationale

Sports fields are many and varied. In Israel, there are a number of organizations training persons with disabilities such as ICSD (Israel Sport Center for the Disabled) and the IDF disabled Veterans Organization. Athletes training in those frameworks and are high achievers participate in competitions in the Paralympics. Persons with intellectual disabilities can participate in two types of Olympic competitions: the Paralympics games and the Special Olympics. In Israel, there are no persons with intellectual disabilities who participate in the Paralympics. However, there are a few hundred participants in nine Olympic fields in the Special Olympics competitions: football, swimming, judo, table-tennis, athletics, cycling, filed tennis and bawling .

Persons with intellectual disabilities are often characterized by having motor difficulties and limitations expressed in the performance of sports skills. These difficulties may influence cognitive, social or emotional areas of functioning or be influenced by them. Therefore, work on the motor field serves both as a therapeutic and rehabilitative tool for each functioning domain. Hemayattala & Movahedi (2010) found that the development of motor or mental skills among persons with intellectual disabilities is not enough. These domains have to develop together, in harmony. They maintain the development and nurturing of one domain contributes to the development of the other (Hemayattalab & Movahedi, 2010).

One of the proposed ways for persons with disability to shift to an active state is physical activity (Hotzler, 2004). Physical activity seeking to develop the disabled person's coping ways, challenge and self-realization, is a means that leads to achievements in other domains. The sense of empowerment will lead to the wish to integrate into society, help in self-acceptance and also enhance the wish to change the environment despite the disability .

The development of the motor domain is of great significance to the independence of a person living in the community as a disabled person. In case of disability in movement, a developmental delay is created in the psycho-motor and

social aspects, which hinders the individual's ability to engage in normative interaction with the environment (Reiter, 2002; Hotzler, 2004; Almosni, 2007).

Research in the field of sports with persons with intellectual disabilities mostly show positive influences of physiological aspects such as gaining weight, fitness and health, quality of life, coordination aspects and muscular flexibility, a sense of self-efficacy and self-esteem (Ben Sira et. al., 2005; Ninot & Maiano, 2007; Lejcarova, 2009; Robertson & Emerson, 2009; Franciosi, 2010; Guidetti et al, 2010; Westendorp et. al, 2011; Cuesta – Vargas et al, 2011; Rasool & Ahmadreza , 2010; Hayakawa et al, 2011).

There are a few organizations engaging in sports for persons with intellectual disabilities. The largest organization is Special Olympics (SO), established in 1968. SO started as a community school program and developed into an organization encompassing some 3,000,000 people around the world competing in more than 30 sports (Maclean, 2008). Most participants are male and at a relatively old age for competitive sport (Gillespie, 2008) .

Few studies were conducted in the SO domain, some of which focused on the physiological advantages and health implications for SO participants as well as on so influence on the participant's quality of life (e.g. Meghann et al, 2012; Gibson et al, 2011; Hild et al, 2008; Turner et al, 2008). Some of the studies focus on the advantages and disadvantages of participating in SO (e.g. Maclean, 2008; Glidden et al, 2011; Smith et al, 2010; Storey, 2004:2008). Other studies focus on the influence of SO participation on mothers and families of children with intellectual disabilities, both from the perspective of the family unit and that of the influence of participation on the pressure within the family (Weiss & Diamond, 2005; Weiss, 2008).

Over the years, several studies related to various sports in SO have been conducted (e.g. Meghann et al, 2012; Gibson et al, 2011; Hild et al, 2008; Turner et al, 2008).

To the best of my knowledge, there are a few studies on table tennis in general, and on the involvement of people with intellectual disabilities in this sector - in particular.

This suggests the importance of this research which examines the effect of a special training program on the physiological aspects of intellectual disabled people participating in table tennis.

Within the framework of the present study an intervention- training program- **Special OTP- Special Olympics Training Program** was implemented.

The intervention training program was implemented for six months.

The research population consisted 10 participants with moderate intellectual disabilities and motor difficulties, who participated in the experiment group, 10 participants with moderate intellectual disabilities who participated in the control group, 20 mothers of the participants, one trainer.

Research Aims: To develop an integrative Physical activity training program for athletes who participate in table tennis games in SO; To explore the influence of an

applicable training program on the balance, hand-eye coordination, power regulation and Movement integration (coordination) among athletes who participate in table tennis games in SO; To develop skills tests for intellectually disabled athletes who participate in table tennis games in SO, in four aspects: balance, eye-hand coordination, power regulation and coordination.

Research questions: What are the effects of an integrative physical activity training program on athletes who participate in SO table tennis games on balance, eye-hand coordination, power regulation and coordination? How do athletes participating in an integrative program and their mothers perceive the effects of their participation in a professional training program?

Research hypotheses: The series of exercises included in the training program will improve the participants' performance in the four established criteria: eye-hand coordination, body-balance, power regulation, and coordination; Participants, whose parents/siblings implement the program at home as well, will advance faster than those who had not; After participating in the training program - participants in the experimental group will improve more than participants in the control group; After participating in the training program- The mothers of the participants in the experimental group and The mothers of the participants in the control group will not have similar perceptions regarding the training program; After participating in the training program - the participants in the experimental group and their mothers will have similar perceptions regarding the training program

Dependent variable: balance, eye-hand coordination, power regulation and coordination.

Independent Variable: integrative physical activity training program.

The importance of the present study: The Research can help to understand how a training program can improve specific skills included in the program, such as - eye-hand contact, coordination, and balance and power regulation, in people with intellectual disabilities

Another practical significance is the use of training these skills for other sports areas with similar skills. The theoretical importance is that people with intellectual disabilities have the ability to learn through a physical activity training program even at an older age.

Another theoretical significance is that this program can be implemented in special education schools.

Key words: special olympics, intellectual disability, physical activity, motor skills, table tennis.

CHAPTER 1: THEORETICAL PERSPECTIVES

The first part presents the theoretical foundations of the research based on, and presents the main theories and key concepts emerging from this study.

1.1 Conceptual Framework

This study sought to discover the ways and extent by which a special training program affects the improvement of table tennis skills of SO (Special Olympics) participants. The first stage of the study was the pilot with two **research Questions**: What components might comprise an integrative Physical activity program for athletes who participate in table tennis games in SO? What components might comprise skills tests for intellectual disabled people in four aspects: balance, eye-hand coordination, power regulation and coordination? After the pilot two research questions were Formulated: What are the effects of an integrative physical activity training program on athletes who participate in SO table tennis games on balance, eye-hand coordination, power regulation and coordination? How do athletes participating in an integrative program and their mothers perceive the effects of their participation in a professional training program?

The following gap in knowledge has brought the rationale for this study and explains its importance: Over the years, several studies related to various sports in SO have been conducted (e.g. Meghann et al, 2012; Gibson et al, 2011; Hild et al, 2008; Turner et al, 2008). To the best of my knowledge, there are a few studies on table tennis in general, and on the involvement of people with intellectual disabilities in this sector - in particular. This suggests the importance of this research which examines the effect of a special training program on the physiological aspects of intellectual disabled people participating in table tennis.

This study is based on four main **theories**:

Views of Physical Activity- Sport and Physical Activity: Definition and Characteristics- In the context of rehabilitation, the connection between sport and Physical disability is important as it serves as a bridge beyond the physical limitations with which disabled individuals must grapple in their lives (Hutzler, 2012). In addition, this chapter includes an overview on the theory of sensory motor development (ayres, 1972).

Development and Learning Theories- : This chapter is divided into three main theories .Piaget's Cognitive Development (1976), Engaged in various stages of human development while explaining the characteristics of each stage of development. Another theory regarding the issue is learning theories: Structural Cognitive Modifiability Theory (Feuerstein & Rand, 1997, 1999; Feuerstein, 1991; Feuerstein et al., 1997; Feuerstein et al., 1979). This theory deals with the significance of mediation and its importance for the promotion of different skills. According to the findings, reviewed all articles on motivation and motivation for learning in particular (e.g. Katz & Cohen, 2014).

The Ecology of Human Development- This chapter provides an overview on the development of the ecosystem in general (Bronfenbrenner, 1979), and the family as an ecosystem of humanity. In addition, will provide an overview engaged in intellectual disability (Ronen, 2005) and studies conducted in this population (e.g. Lifshits, 2014).

Physiological and Educational Theories of Table Tennis (e.g. Van Biesen et. al., 2014). Describing some studies conducted in the field they are in the normal population and people with special needs.

Terms of the research:

Physical Activity Training Program: Many studies have shown that the work of the athletes according to a training program improves physical and mental capabilities. Studies indicate that for people of all ages, practicing aerobic training such as jogging, consume more oxygen from people who are not trained. Intensive training program level and frequency as improved muscular and cardiovascular system of the athlete, as well as helping to improve different fields of life.

Ecological Family Support: Ecosystem is a system that surrounds the human being. The most immediate environment affects human the most significant. Between different environments is a system of reciprocity. Human impacts on the environment such as the environment affects human. The family is the closest environment of the person, and is a model for his coping in the community. In this study, the training program was implemented at home by parents and brothers and examined its effect on the tested skills.

Table Tennis: The origin of table tennis is in England at the end of the nineteenth century. Most of the table tennis associations operating in central Israel amateur athletes. The aim of the game is to hit the ball so that it lands on the other side of the table, and the opponent cannot return it. Table Tennis is a very fast rates and that requires effort, stamina, long practice and regular training to acquire higher skills. This domain is very complex in terms of motor because it combines many complex skills.

Special Olympics: Is an international organization that involves people with intellectual disabilities. The organization was established in the late '60s in the United States and currently companies in 190 countries, including Israel and participate in about three million athletes. In Israel, it is not large relative to the number of residents, and active in only a few thousand people with intellectual disability and in various ages.

Intellectual Disability: Intellectual disability is a neurodevelopmental disorder in which low intellectual functioning. Compared to the average person, with this impairment exists significant delays or significant difficulty in acquiring skills in various functional areas of learning. There are several levels of functionality. Often accompanied by mental disability and physical disability is due to genetic factors, congenital or birth-related causes such as injury or illness (Ronen, 2005).

Physical Activity & ID: Studies on physical activity among people with intellectual disabilities show that there is a relationship between physical activity and its quality, and the level of intellectual disability and its flexibility.

Motor Skills: The first motor domain is in the process of development with age, the rest of the systems developed in an integrated way with each other. In this study four motor skills were conducted: **balance, hand-eye coordination, power regulation and coordination.**

Balance: Balance is a term equal forces acting on an object. To maintain balance, should be a balance between the forces exerted on the muscles and the external force like gravity. Static balance is keeping the center of gravity with minimal movement and dynamic balance is when we change actively support base to support the new center of gravity in its place (Lavian- Elul & Carmon, 2008).

Hand-eye coordination: The ability to create coordination between the movement of the muscles of the hand and the eye muscle movement in order to create a movement. It is a daily leaving action which we use for basic operations (Boisseau et. al, 2010)

Power regulation: Power regulation is defined as a force depending on the exact power operation and the ability to invest in the appropriate power level requirements of the task in which the person experiences. One method for Power regulation is throwing a ball to a different distance and with different weights in hand (Lavian- Elul, N. Carmon S, 2008).

Coordination is Regulation of various elements into an integrated and harmonious action, in order to achieve a common goal. Coordination is achieved by combination between the senses and the Muscles. Action is done when the brain receives certain information, it processes it into action, gives a command organ function, and then creating appropriate course of action (Lavian- Elul, & Carmon, 2008). The main theories and concepts on which the present study was conducted are presented in Figure 1.

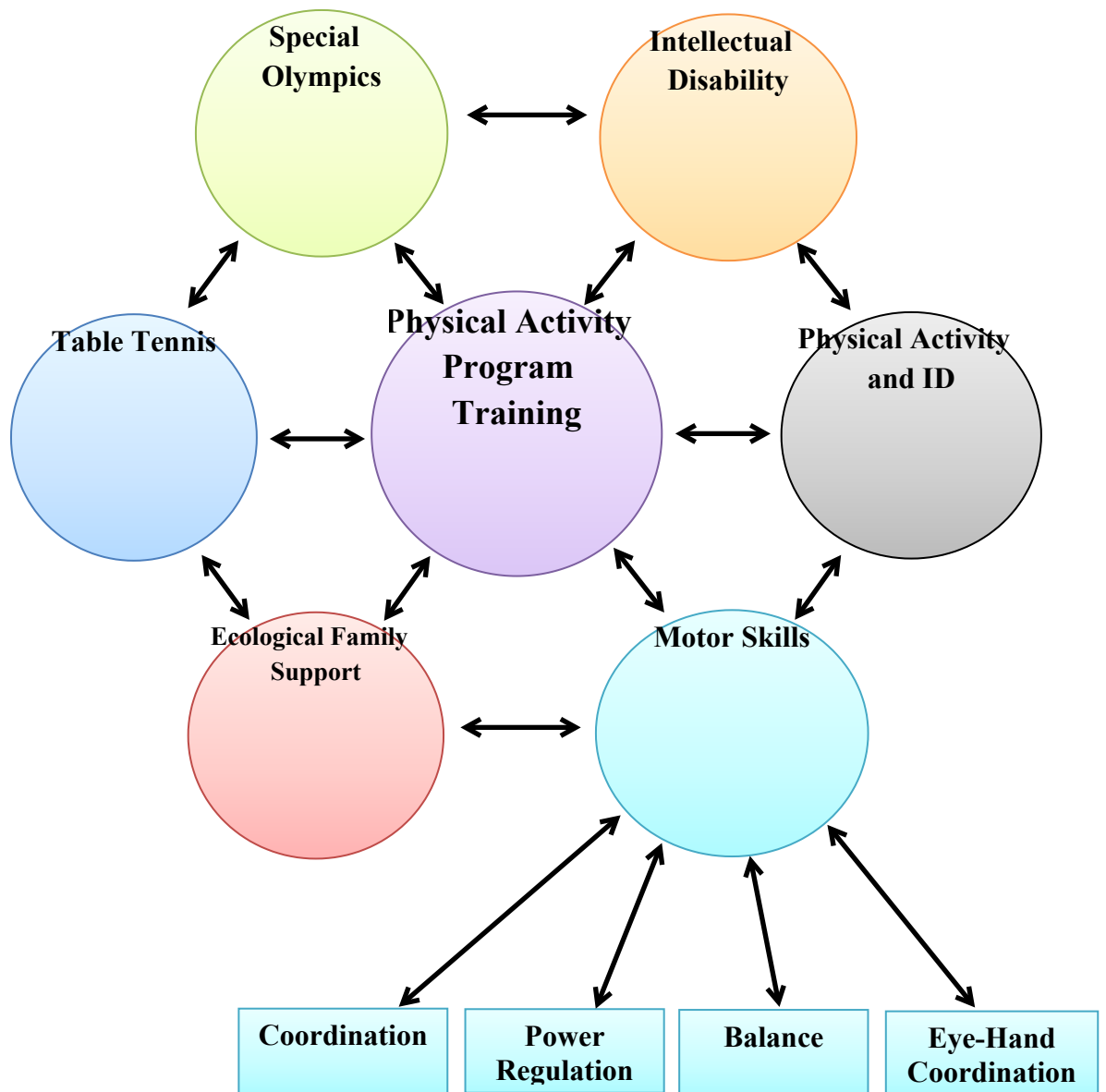


Figure 1: Main Concepts and Theories of Physical Activity Training Program for people with intellectual disability

1.2 Physical Education for Individuals with Special Needs (Research and Exercise Programs)

In 2005, Almosani et. al., (2005) conducted a study in Israel among 90 young adults between the ages of 18 to 21, with mild intellectual disabilities, but only those who did not have any physical disabilities. The study sought to examine the influence of various teaching methods: Command style, Divergent Production Style and structured style of physical activity on the quality of life of the young adults with slight to average intellectual disabilities. The research tools were a Quality of life Questionnaire and the Tennessee Self-Image questionnaire. The following parameters were included in this study: self-image – physical, moral, personal, family, and social. The measures for quality of life were: satisfaction, happiness, ability to be productive and independence, and social belonging. The experiment was conducted by using three different teaching methods in three stages before, at the conclusion and then after a period of no instruction or intervention by researchers.

Results of the study showed that each instruction style had some influence on the variables. In the intervention stage a substantial improvement was noticeable in all realms of quality of life; whereas the variables of strength, independence, social belonging yielded no significant improvement in the Command Style group. Only three self-image parameters improved during intervention: self-satisfaction, social self-image and behavior. With the last two variables, there was a certain regression in the Command Style group, while improvement characterized only the two other groups. Thus, learning in different teaching styles had different effects on the quality of life as well as self-image variables in each stage of the experiment. It was clear that this group of individuals with intellectual disabilities responded positively to all styles of instruction, including those that were previously unacceptable. Hence, physical education individuals with intellectual disabilities can improve their quality of life.

A study was conducted in France by Gregory & Christophe in 2007 with the purpose of examining differences between two groups of individuals with intellectual disabilities, aged 13-17, in terms of social acceptance and self-esteem. The two groups included individuals with intellectual disabilities who trained in groups together with normative individuals, in contrast to the second group which was comprised only of individuals with intellectual disabilities who trained in a non-integrative framework. Several sports were included, among them basketball, swimming and athletics. Forty eight women with slight-moderate intellectual disability participated in the study (N=48, with an IQ of 40-78, between the ages of 13-17). The primary data collection tool was Harpers spp. Variables examined in this study were social acceptance and self-esteem. The findings showed no differences between the groups in terms of social acceptance; however, findings of the study demonstrated a significantly lower level of self-esteem among the basketball group, as opposed to the athletics group. Another interesting finding showed that an integrative environment helped adolescents with intellectual disabilities to adopt realistic expectations with regard to their physical abilities.

In 2009 Lejcarova conducted a study in Prague, which sought to examine the correlation between the intellectual level and various coordination capabilities. 153 children participated in the study (N=153, 61 f, 92 m) all with intellectual disabilities, but with normal cognitive development according to the following subdivision: 11 pupils with an IQ of 50-59, 31 pupils with an IQ of 60-69, 61 pupils with an IQ of 70-79, 36 pupils with an IQ of 80-89, 14 pupils with an IQ of 90-100, all between the chronological ages of 9 and 11. The research tools were various tests to measure elements of coordination: Cohen's d index, Non rhythmic drumming test, asynchronous and asymmetrical arm movement, one leg standing endurance test with eyes closed, jump over a skipping rope, routine with rod test, backward long jump test, and jump onto target test.

Coordination was measured in terms of balance and kinesthetic ability. Results of the study showed that there were significant differences between the pupils who were at the bottom of the mildly disabled category and those pupils whose intellectual abilities were at the top of mild disability. Moreover, it was apparent that there was an inverse relationship between intellectual level and coordination level – the more severe the intellectual disability, the lower the physical performance.

Despite this finding, the best results were surprisingly found among the pupils whose mental level was just below average, and not among those with higher level intellectual abilities. The conclusion is that the differences do not necessarily depend on the intellectual level, but also on the etiology and personality, i.e. the participants' motivation, and environment.

In 2009 in England, Robertson & Emerson conducted a study to examine participation in sports among the mildly mentally disabled. 2,784 participants with mild intellectual disabilities took part in the study (N=2,784) between the ages of 16-91. The main research tool was a personal interview and when the interviewees encountered difficulties in answering the questions, the researchers used a tool called "proxy respondents". The results of this study showed that 41% of the participants had done some form of sport activity and swimming in the month before. 97% of the participants reported liking the activity. Of those who did not take part in any sport, 34% said they would like to take part in a sports activity more frequently. Some of the mentally disabled participants did not take part in sports because of their low socioeconomic state, felt too insecure in their neighborhood to venture out and attend a sports activity. The study may point to the possibility that socioeconomic factors come into play and can deter participation in sports activities.

In 2010 in Italy, Franciosi conducted a research study to evaluate the contribution made by certain variables to sports achievements and to analyze the correlation between each variable and the level of intellectual disability. The participants were twenty nine trained athletes (N=29, 17 m, 12 f) with varying levels of intellectual disabilities according to the following subdivision: 9 mild intellectual disability, 8 with moderate intellectual disability, 9 with high intellectual disability, and 3 extreme intellectual disability between the chronological ages 20-45. Two main tests were used: Physical fitness and coordination test battery; Step test.

The variables under scrutiny were body size, flexibility, muscle strength, explosive power in legs, endurance and the cardio-vascular system, and motor coordination. The results of the study showed that for each test there was a particular variable which influenced the results. In the 60 meter sprint – coordination and body weight; in the 300 meter run – percentage of body fat and explosive power in legs; in long jump - explosive power in legs; 100 meter run - percentage of body fat. Similarly it was found that the lower the level of disability, the higher the achievements in motor coordination and sit-ups.

In Italy, Guidetti et.al. (2010) conducted a study to find if sports activities affect the physical fitness and health of young adults with intellectual disabilities. Sixty four participants were included in the study (N=64, 38% mild disabilities, 22% moderate, 38% difficult and 3% extreme). Participants in each sport were as follows: 22 athletics, 19 basketball, 23 participated in no sports whatsoever. All were in the age range of 18-45 years of age. The following research tools were used: Step test; Standing long jump test; Hand grip test; Sit ups and push-ups test; Timed up and go test; Flamingo test; Sit and reach test; Spearman correlation analysis.

The examined variables were: standing, jumping, hand grasp, sit-ups, standing on one foot. The results of the study showed that BMI values and static equilibrium had changed in all groups. Athletes and basketball players displayed higher achievements of explosive power performance than non-athletes. Additionally, better results were apparent in the athletic groups for cardiovascular endurance and motor coordination – the grades were higher as the intellectual disability was milder.

In Holland Westendorp and others (2011) conducted a study among individuals with intellectual disabilities to examine the correlation between motor abilities and participation in organized sports activity. 156 children with mild intellectual disabilities participated in the study (N=156, 104 m, 52 f) between the ages of 7 and 12, and 255 children with normal development (N=255, 138 m, 117 f) in a similar age bracket. The examined variables were running, leaping, jumping, sliding, catching, kicking, bouncing and throwing. Each skill was measured twice and valued on a scale of level of success. Research tools used were TGMD-test of gross motor development, as well as self-report measure and the data was analyzed using SPSS. Results showed the children with intellectual disabilities scored significantly lower than their normative counterparts in almost all of the motor skills. Those with high scores regularly took part in more organized sport activities. Moreover, participation in sports activities improved the motor skills of the intellectually disabled children. More progress was observed in the object control skills such as throwing, rolling, kicking and catching.

Nevertheless, children with mild intellectual disability attained lower scores in the loco-motor measures, such as running, racing and jumping in comparison with borderline children.

In Spain Cuesta, Vargas et. al. (2011) conducted a study to examine and describe the physical activity profile of athletic adults with intellectual disabilities and identify whether there is a performance difference between those who are active and those who are inactive in sports, and the difference between male and female

performance. 266 people with mild intellectual disabilities participated in the study (N=266, 187 m, 79 f); the mean age was 31.1. Research tools focused on various elements of flexibility: Passive Knee Extension Test, calf muscle flexibility test, anterior hip flexibility test, functional shoulder rotation test, timed stand test, the partial sit up test, seated push up test, the grip test, the single leg stance open and closed eyes, 3 min. walk test.

The variables being tested were shoulder, knee, thigh, and hip flexibility, standing on one foot, opened and closed eyes, 3 minute walk, and sit-ups. Results of the study showed a definite gap between the genders in flexibility performance. Male performance was higher for strength and balance. There was no significant difference in those who took part on sports activities and those who did not, with the exception of one flexibility test. The statistical differences recorded between the sexes were of no significance.

As previously mentioned, a number of studies were found to engage in the effect of training, both mental and physical on cognitive abilities. The aim of Hemayattalab's study, which was conducted in Iran in 2010, was to examine the effect of five variations of exercise on the learning abilities among adolescents with intellectual disabilities. The five variations of training were as follows: physical training, mental training (use of imagination), physical training and some mental training in combination, mental training with some physical training in combination, and a control group with no training whatsoever. 40 adolescents aged 12 – 15 with mild intellectual disabilities participated in this study (N=40). The research tools were EMG, self-report measures ANOVA and the variable which was examined was free toss into a basket. Results of the study showed an improvement in all of the groups that had some form of training. The best results were in the groups that utilized both physical and mental training in some combination. The major conclusion drawn from this study is for physical educational instructors to use some combination of mental and physical training to attain most effective achievements with adolescents with mild intellectual disabilities.

Hayakawa et. al. (2011) in Japan, also conducted a study on the topic of effectiveness of various types of training using special training equipment on improving stable position and muscle strength of individuals with mild intellectual disabilities and or autism. 23 participants (N=23,) took part in the study, some of them with limited mobility who needed accompaniment but most functioned independently in their everyday life. The variables examined were standing position, different exercises in sitting position, walking and running on gym equipment. Results of the study showed that there was a marked improvement in the physical condition of the participants in running, hurdle walk and running on a treadmill. Additionally, knee flexibility increased. Use of gym equipment increased motivation the participants' to exercise more.

To summarize, in the past, several studies have examined the correlation between motor activities and intelligence. Results of these studies led to numerous conclusions with regard to the nature of this connection between the two variables, indicating that only some of the motor variables, such as coordination, balance and

kinesthetic sense demonstrated a positive correlation with level of intelligence (Singer, 1968; Franciosi et. al., 2010).

Other studies showed the correlation between intelligence and sport to be fluctuating, relative to the intelligence level when measuring reaction time and characteristics of motor activities measured while measuring the length of motor activity (Nettlebeck, & Kriby, 1983; Campbell & Noldy, 1985).

A small number of studies engaged in the influence of age on the correlation between intelligence and physical activity. Results of the studies showed a stronger correlation in younger children than in adults, albeit the quality of the connection did not diminish gradually or uniformly with age, but rather in accordance with maturity, learning experience and other environmental factors which blurred the connection. (Dibner & Kron, 1969; Silva et. al., 1982).

Singer (1984) claimed that the difficulties encountered in learning motor skills depend on motor experience rather than on the level of intelligence. Children and adults do not differ in their level of success in learning motor skills, but rather in the manner in which they learn. (Almosani et. al., 2005) added that the style of teaching has an effect on the components of quality of life and self-image among the intellectually disabled individuals. Studies conducted by Yando (Yando et. al., 1978; Weiss, 1983) and Almosani (2005) have related to learning motor skills as being connected to verbal capabilities. For instance, a group of adolescents used verbal and nonverbal models during motor learning as opposed to preschool children who learn solely on the basis of observation.

Individuals with disabilities first entered the Olympic competitions in 2000. They participated only in three sport branches: swimming, gymnastics and basketball. During the games it was found that there were deceits regarding their classification and level of intellectual performance. Countries issued fictitious certificates just to get the athlete with intellectual disabilities to a lower classification, and thus the chance of winning an Olympic medal increased. For this reason the method has changed and so far no athletes with intellectual disabilities have participated in the Paralympics (which are for physically handicapped athletes who were handicapped in birth or in the course of their lives).

For 12 years since the last time individuals with intellectual disabilities participated in the Paralympics, have different organizations (e.g. INAS for Para-Athletes with an Intellectual Disability and IPC – International Paralympics Committee) attempted to create an objective and measurable classification methods that would be relevant to sport. The organizing committees have required criteria that would assess whether the intellectual disability affects functioning in a specific sport.

In the 2012 London Olympic Games, athletes with intellectual disabilities participated only in four sport branches: swimming (class 14), gymnastics, basketball and rowing integrated into a category of motor handicap.

There are a few organizations engaging in sports for individuals with intellectual disabilities. The largest organization is Special Olympics (SO), established in 1968. SO started as a community school program and developed into an organization encompassing some 3,000,000 people around the world competing in

more than 30 sports (Maclean, 2008). Most participants are male and at a relatively old age for competitive sport (Gillespie, 2008). Few studies were conducted in the SO domain, some of which focused on the physiological advantages and health implications for SO participants as well as on So influence on the participants quality of life (e.g. Meghann et. al., 2012; Gibson et. al., 2011; Hild et. al., 2008; Turner et. al., 2008). Some of the studies focus on the advantages and disadvantages of participating in SO (e.g. Maclean, 2009; Glidden et. al., 2011; Smith et. al., 2010; Storey, 2004; 2008). Other studies focus on the influence of SO participation on mothers and families of children with intellectual disabilities, both from the perspective of the family unit and that of the influence of participation on the pressure within the family (Weiss & Diamond, 2005; Weiss, 2008).

Such a competition takes place every four years in a different location in the U.S. – this is the Special Olympics. The SO concept is not necessarily based on achievement, but is rather socially oriented. The competitions are held in clusters of 8, where everyone wins. Categories or clusters are not by disability, but are based on ability. Meaning one can be a low-level swimmer, but a champion. In general, the approach is social, rehabilitative and highly flexible.

Philosophy and principles – the organization was established in the belief that with help and guidance, individuals with intellectual disabilities can engage in individual and team sports, regardless of their disabilities. The basic principle of the Special Olympics is that anyone can do it. The sport activities are based on universal values: participation is free of charge, anyone can participate and the athletes compete against athletes who are their equals in terms of their level of performance. They all receive awards out of respect for their efforts and training.

The goal of engaging in sport is the improvement of physical fitness and physical capabilities as well as enhancing their self-image, sense of self-efficacy and self-confidence in their own eyes and those of their families and communities. In this way they can better integrate into society as productive citizens. Involvement in sport activities in general and in competitive sports in particular provides the athletes with an opportunity to experience success and winning and gives them the feeling that they are "equal". For the athletes, "Special Olympics" is a way of life. Below are the principles of SO as mentioned in the website (<http://www.specialolympics.org/>):

1. Every person with an intellectual disability may participate in the organization's activities;
2. Participation is free for the athletes, so as to allow them to take part in sport activities regardless of their socio-economic background;
3. Coaches must be especially trained in special education to work in the field;
4. In the competition, each athlete competes with peers who are equal in the level of performance, meaning that a swimmer who swims 25 meters in 90 seconds will compete with others who swim at more or less the same rate. In this way, age and gender are of no consequence. Only the level of performance counts. In ball games as well, the competition is by levels of competence.

5. The winners' podium includes winners from first to eighth place. Each competitor is awarded for his or her performance out of respect and appreciation for their training and effort.
6. In international competitions and the Olympics, competitors are not allowed to wear national costumes, due to the notion that all people are equal, and there are no differences among them.
7. The Special Olympics motto is "*Let me win, but if I cannot win, let me be brave in the attempt*".

Israel joined the Special Olympics venture under the sponsorship of AKIM (National Association for the Habilitation of children and Adults with Intellectual disabilities). Since joining, Israel has participated in overseas competitions and holds activities in a number of sport branches such as swimming, football and basketball. Today the Israel Special Olympics organization acts as an independent association based on donations from a number of organizations. Some 3,000 athletes are members of the association, participating in sports such as swimming, basketball, tennis, table tennis, bowling, judo, cycling and gymnastics. There are no athletes in the Israel SO that meet international criteria, as they do not reach the required minimum level. No athletes with intellectual disabilities who are willing to make this great investment of time and intensive training have been found in Israel.

The current research population consists of people with intellectual disabilities who train for Table Tennis competitions.

1.3 Physiological and Educational Theories of Table Tennis

Table Tennis developed in the end of the 19th Century in England. Table Tennis was first introduced as a sports branch in the 1988 Seoul Olympic Games and is highly popular in Asia and Europe. Only a few studies have been conducted about this sports branch in terms of the normative population (Sindik, 2013; Zhang, 2012) and the population of persons with intellectual disabilities (Van Biesen et. al., 2014; Van Biesen et. al., 2010).

Although it has not been researched much, there are a number of research studies engaging in Table Tennis in general (e.g. Sergio et. al., 2002; Raab, 2005; Zhang, 2012; Sindik et. al, 2013; Silva et al, 1982).

Sport in general and branches which involve rapid ball movement in particular require the athlete to make fast decisions regarding how to hit the ball and which movement to choose in order to react to the ball toward him or her. This means the game consists of two main components: technique and tactics (Abel et al, 2004; Raab et. al., 2005; Zhang et. al., 2012). Vickers (2003) proposed a training program which includes repetitive practice of the skill and dividing the skills into stages of movement, where learning occurs from the easiest aspect to the hardest ones, based on the assumption that movement is learnt from the declarative aspect to the procedural one (Vickers, 2003). Vickers (2003) designed a Table Tennis program which integrates the cognitive aspect of decision-making and the technical aspect of learning the skill, assuming that movement or training must be as realistic as possible,

and since Table Tennis is a game which combines rapid decision-making, as well as matching the type of strike and its quality to the characteristic of the returning, this type of integrated training is the best in his opinion.

Research conducted by Vickers on two groups showed that the group that received motor training combined with video analysis of the way in which the game was played and drawing conclusions from the analysis improved achievements more than the group that learnt the technical skill only (Vickers, 2003; Raab et. al., 2005).

In their research, Zhang et. al. (2012) added play practice training to the components of Table Tennis such as the initial serve and strike, as well as Skill-focus instruction (SI). In this case, too, the research findings showed, although other components were measured as well, that training accompanied by guidance and explanations was more effective than training without explanations (Zhang et. al., 2012).

Table tennis is one of the fast ball games branches, and hence, a coach experiences all the elements and nuances of effective training (Sindik, 2013). From the perspective of sport, effective training or an effective game is expressed in the result.

Success depends on the analysis of data about the given object. A Table Tennis player who succeeds in seeing the ball at the right time and the right place is likely to successfully strike back. Timing then is of the utmost significance for the player to transfer motor commands based on information received visually. Additional information obtained visually may also help assess the type of serve and its characteristics. Sergio et. al. (2002) conducted research which showed how the eye-hand coordination is of great significance in Table Tennis. The research findings revealed that competent players followed the ball with their eyes and reached higher achievements than the less competent ones (Sergio et. al., 2002).

Hand-eye coordination is one of the components representing this sport branch directly. Most hand-eye coordination studies have been conducted in laboratory conditions and cannot genuinely testify to what happens in a real Table Tennis game (Williams & Davids, 1998). One of the first field research studies examined the players' performance when the coach gave them instructions to keep their eyes on the ball along its trajectory (Pippol & Felurance, 1998). The results showed that players reacted better both in terms of the quality of their strikes and the speed of reaction to balls which reached the middle line of the body rather than to those which went towards the sides.

The field of Table Tennis among individuals with intellectual disabilities has not been sufficiently researched. In the past, individuals with intellectual disabilities who played professional Table tennis could participate in the Paralympics. In 2012, after 12 years without playing, the Olympic Committee approved the return of athletes with intellectual disabilities to the Paralympics, and decided not to limit their participation to the Special Olympics. Classification tests that players have to take to qualify for the Paralympics are measured via numerous parameters, as is the case with all Paralympics participants. Nevertheless, there are other elements such as anxiety,

stress or medical problems which might influence the players' state, especially those with intellectual disabilities (Biesen et. al., 2010; Biesen et. al., 2014).

Research conducted by Biesen (2014) focused on individuals with intellectual disabilities who participate in the Paralympics. The research sought to compare the results of technical performance in a game simulation and those of a real game. The findings showed no significant differences between the simulation and a genuine game in most components (Biesen et. al., 2014). To this day, individuals with intellectual disabilities take much longer to learn in general and motor skills in particular. As a rule, it is harder for individuals with intellectual disabilities to learn motor skills than for individuals without intellectual disabilities, and the same is true for reaction time (Porretta & Moore, 1991; Biesen et. al., 2010).

The current research engages in children with intellectual disabilities who compete in Table Tennis in the Special Olympics. The findings of the studies reviewed above constitute the grounds for a training program developed in order to advance children with intellectual disabilities in skills related to Table Tennis, though some of the skills pertain to Tennis Table players who are not intellectually disabled. Nevertheless, numerous studies were conducted regarding the learning abilities of individuals with intellectual disabilities despite their disability (Lifshitz, 2005). Hence, the training program integrates the learning of motor skills, learning discourse and analysis of the players' video-filmed games.

Physical education curricula exist all over the world. The significance of physical activity has been researched in depth, and the findings show physical activity benefits those who engage in it.

Shoval and Talmor (2004) described a study conducted in school, where physical activity was at the heart of the change process. The program was implemented in order to try and cope with many difficulties which children experience, such as social difficulties, behavior problems and low motivation. The conclusions were that the training program helped enhance some basic elements such as cooperation and mutual responsibility, as well as independence and assuming responsibility, and that is why this program is highly significant (Shoval & Talmor, 2004).

In 1984, some 10 years after the Israeli Ministry of Education had recommended a physical activity program in special education, a survey was conducted in all special education preschool and schools. The survey included questions regarding the size of the population, teacher training, facilities and hours of physical activity in the school. The findings revealed a great gap between the desired situation and reality in the domain of the hours allocated for the activity, facilities and the teachers' professional training (Hotzler & Shoshani, 1995). This is especially true for Table Tennis, which is not taught at school at all, except some special cases such as the case of the Australian Ministry of Education, where it was decided to introduce a special Table Tennis program for children whose development is normative. This decision derives from the assumption that when learning to play Table Tennis, the children learn skills, some of which are simple and others – complex, but all of them contribute to the child's motor and physiological development, and hence, it was

decided to develop a profound and detailed Table Tennis program in Australia (Tepper et. al., 2002).

CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY

2.1 Research Paradigm

This mixed methods research will combine quantitative and qualitative methods. The qualitative paradigm presents the social reality as a product of interpretive processes which are influenced by personal and personality factors. The research engages in the exposure of the meanings attributed to the reality and the researcher's and the participants' interpretations (Kassan and Krummer-Nevo, 2010). This type of research connects the researcher and the participant, when words are the database and the research focus shifts from the universal domain which can be classified and generalized to the local and personal subjective domain (Clandinin & Orr, 2007; Freeman, 2007). Quantitative research is based on the assumption of the existence of one reality which the researcher has to uncover via using objective research tools. Quantitative research seeks to confirm predetermined hypotheses, and reach validity, reliability and generalizability. Usually such research examines associations between variables (Sever, 2005).

The proposed research combined the different methods from the different paradigms, thus it was able to provide a holistic view of the research in its qualitative part, and examine associations between variables and generalize in its quantitative part.

2.2 Research Design (**dimensions of table**)

		Aim	Research Tools	Research Population
Pilot 3.5 months 60 training hours with a trainer		To design and validate skill tests for the training program To validate the implementation of the training program	Semi-structured interviews measurements	Training program- 3 trainees Skill tests- 10 trainees
Cycle A 3.5 months, 60 training hours with a trainer	Qualitative Research	To explore expectations of the training program	Semi-structured interviews	5 parents 5 trainees 1 trainer
	Quantitative Research	Measuring the 4 parameters of skills: - hand-eye coordination; - Balance	measurements	10 SO trainees

		- Power regulation - Coordination		
Improving the training program 1 month	Qualitative Research	To reveal strengths & weaknesses	Semi-structured interviews	5 mothers 5 trainees 1 trainer
Cycle B 3.5 months, 60 training hours with a trainer	Quantitative Research	To examine improvement of skills	measurements	10 SO trainees
		To make a Questionnaire Analysis - statements from interviews	questionnaires'	10 SO experience group 10 mothers of participants in the experience group 10 mothers of participants in the control group
	Qualitative Research	To examine improvement through participants' perceptions	Semi-structured interviews	5 mothers 5 trainees 1 trainer

2.3 Research Method

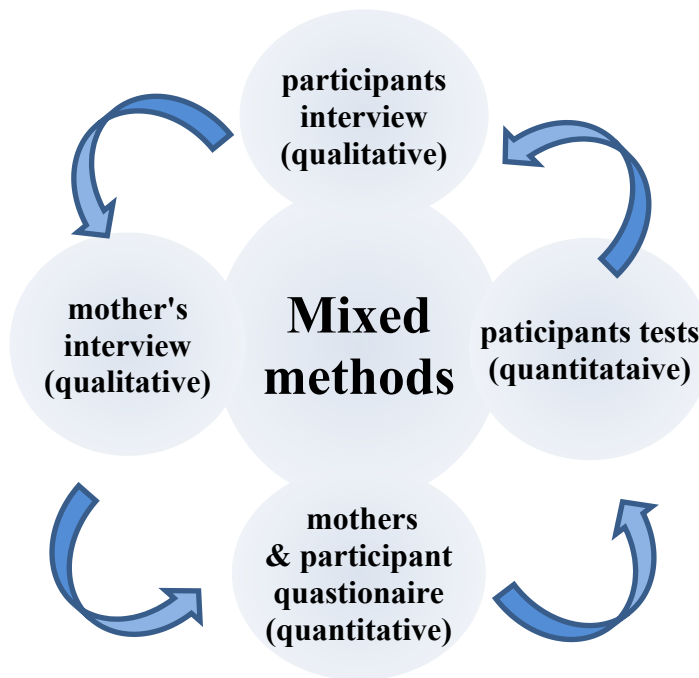


Figure 2: Research Method

2.4 Research Tool: Quantitative tool: Measurements of Skills Test and questionnaire

Qualitative Tool – Semi-Structured Interview

2.5 Research Population

The research population consists of people with moderate intellectual disabilities trained in SO in the field of table tennis and their mothers and 10 participants with moderate intellectual disabilities in the control group and their mothers. The population of people with intellectual disabilities in sports training in Table Tennis at the Special Olympics in Israel is very limited. For this reason the number of participants in the experimental group is 10 people with intellectual disabilities and motor difficulties, and ten other people with similar characteristics, participants in the control group. Since Israel does not have many SO participants in general and table tennis players in particular, it was impossible to conduct the research with a larger number of participants. Therefore, ten participants were selected with a similar general cross-section. As we know, people with intellectual disabilities are inclined to experience additional difficulties such as motor, behavioral, and emotional difficulties. This research and the program constructed to achieve its goals were only being directed at an improvement of motor skills, without examining other aspects.

The researcher chooses a phenomenon or behavior using a person or group of people whose number depends on the research type. Quantitative research involves a random sample of many participants whereas the number of participants in qualitative research is significantly lower (Shkedi, 2003). Therefore, in qualitative research the researcher selects a **purposive sample**, meaning a sample of the participants that represent the researched population who can teach us about the phenomenon itself (Mason, 1996). The participants in this research were selected from the Israeli table tennis team, as well as candidate to participate in competitions in and outside Israel.

2.6 Triangulation, Validity, Reliability, Generalizability

In this research, reliability was expressed through triangulation. Triangulation is the use of multiple sources of data in order to obtain a multi-dimensional and holistic view of the research environment and its various components. Using different research leading phenomenon Research greater validity than the use of only one study. To examine the reliability of the four tests Cronbach's Alpha coefficients, measuring the internal consistency were computed for each index. The results are presented in Table 1.

Table1: Cronbach's Alpha coefficients (the positions of table – centrated)

Parameters	Cronbach's Alpha	Deleted items
Balance	0.90	none
Hand eye coordination	0.83	none
Power regulation	0.80	none
(Coordination (Number operations together	0.82	none

The table shows high level of reliability in each one of the parameters. Which means that can be used in the current study.

After analyzing the interviews, a questionnaire was constructed based on statements from the interview. **Cronbach's alpha** was tested this questionnaire.

20 statements were divided into two categories based on considerations of content.

Two categories were obtained (1) Factors that obstructed the participants; (2) Contributions of the training program.

Cronbach's alpha was calculated for each of these categories:

In the category of obstructions found Alpha .76 after removing statement no.16 "My child was disappointed with the program".

In the category of contributions to the training program found Alpha .96 which shows a high internal consistency between the statements. **Validity**- In these research 11 specialists checked and confirmed the tests for specialist validity: 3 specialists in sports, 3 specialists in special education, 1 Physiotherapist, 1 Occupational Therapist and 3 table tennis players. This research is non-parametric, which means not with average but with Incidence. **Generalizability**- In this research, there is a presentation of the participants' accounts without bias, and the participation in the training program increased the participants' social awareness, thus establishing the validity of the research.

Triangulation was performed on several levels: using different research methods: case study, action research, and statistical analysis of the data. In addition, interviews were conducted on three levels: the trainer, the trainees, and their parents. This allows for cross-referencing of data and drawing conclusion more accurately.

Given that this research uses several research methods, it was be possible to generalize the conclusions to people with intellectual disabilities in general and table tennis players with intellectual disabilities in particular.

2.8 Ethical Considerations

Because this research involves people with intellectual disabilities, who have been classified as "vulnerable", the researcher attained the consent of the parents through a signed consent to participate in the research. Thus making sure that the people can participate and be interviewed. In addition, all of the details of the research remained confidential, the participants were referred to by using pseudonyms, and the data is presented as they are, without bias. Furthermore, the researcher asked for the parents' permission before publishing anything that might reveal their identity, be it

documents or pictures. Through all these, the researcher protected the people with intellectual disabilities from harm.

CHAPTER 3: FINDINGS

3.1 quantitative Findings

Research question 1: What are the effects of an integrative Physical activity training program on athletes who participate in SO table tennis games on balance, eye-hand coordination, power regulation and coordination ?

Research question 2: How do athletes participating in an integrative training program and their mothers perceive the effects of their participation in a professional training program?

Hypotheses 1: The series of exercises included in the training program will improve the participants' performance in the four established criteria: eye-hand coordination, body-balance, power regulation, and coordination.

Group Statistics					
	Time	N	Mean	Std. Deviation	t
General balance measure	Before	10	13.6000	3.80643	2.89**
	After	10	18.2000	3.29309	
General hand-eyecoordination measure	Before	10	13.2000	3.04777	2.67**
	After	10	16.9000	3.14289	
Power regulation	Before	10	14.7000	3.09300	3.73**
	After	10	21.1000	4.45845	
Coordination	Before	10	8.0000	2.16025	2.46*

The results indicate a clear improvement in each skill after the program. General hand-eye coordination and coordination show the lowest improvement compared to balance and power regulation which show very high improvement.

Hypotheses 2: Participants, whose parents/siblings implement the program at home as well, will advance faster than those who do not.

Group Statistics					
	Group	N	Mean	Std. Deviation	p
D balance	At home too	5	4.2000	1.78885	n.s
	No home training	5	5.0000	2.54951	
D eye hand	At home too	5	4.2000	.44721	0.04
	No home training	5	3.2000	.83666	
D power	At home too	5	6.6000	2.96648	n.s
	No home training	5	6.2000	3.11448	
D coordination	At home too	5	2.4000	1.34164	n.s
	No home training	5	2.6000	1.51658	

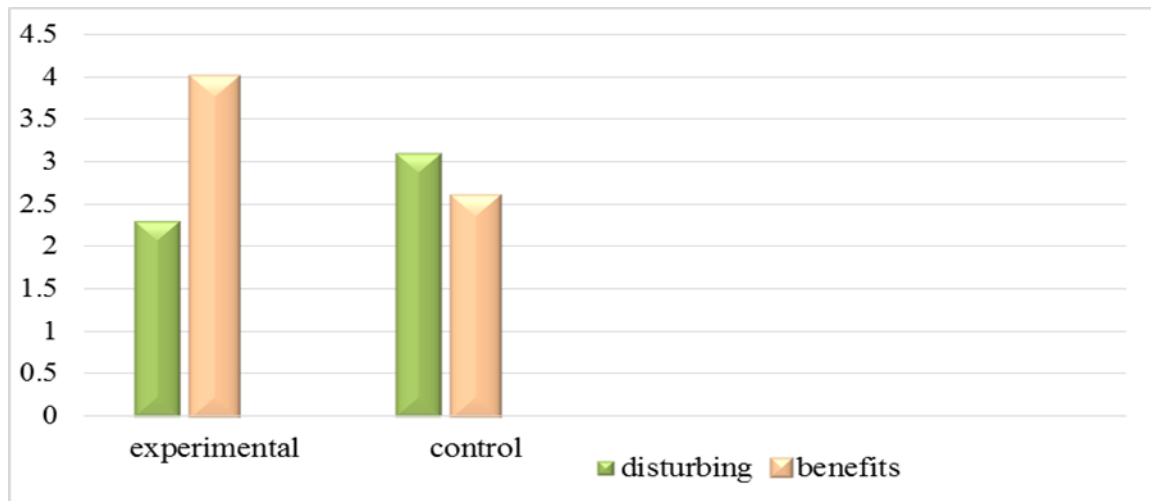
A clear difference was found between the groups in the hand eye coordination measure, where the group that trained at home got a higher improved score in this measure (4.2) than the group that did not train at home (3.2). **In the other three measures, there was no difference between the groups**

Hypothesis 3: After participating in the training program - participants in the experimental group will improve more than participants in the control group

Group Statistics					
	Time	N	Mean	S.D	t
Balance	1.00	10	13.6000	4.00555	.30
	2.00	10	13.1000	3.54181	
Eye-hand	1.00	10	11.8000	2.74064	.53
	2.00	10	12.5000	3.24037	
Power	1.00	10	14.3000	2.94581	.08
	2.00	10	14.4000	2.75681	
Coordination	1.00	10	7.9000	1.37032	.18
	2.00	10	8.0000	1.15470	

The results show that there are no significant differences in any of the four skills. The level of performance has not changed from the first measurement to the second measurement.

Hypotheses 4: After participating in the training program- The mothers of the participants in the experimental group and The mothers of the participants in the control group will not have similar perceptions regarding the training program



The figure demonstrates the significant differences between the two groups. **Mothers in the experimental group see the advantages of the training program in a more significant manner than mothers in the control group.**

Hypotheses 5: After participating in the training program - the participants in the experimental group and their mothers will have similar perceptions regarding the training program

Table 35: Group statistics: comparison of perception of training program (mothers and participants) (N=20)

	Group	N	Mean	Std. Deviation	Std. Error Mean
Disturbing	mothers experimental group	10	2.3667	.90880	.28739
	participants with intel. dis	10	3.0000	1.04231	.32961
Benefits	mothers experimental group	10	3.9750	.68668	.21715
	participants with intel. dis	10	4.0813	.65421	.20688

		t	df	Sig. (2-tailed)
Disturbing	Equal Variances Assumed	-1.448	18	.165
	Equal Variances Not Assumed	-1.448	17.672	.165
Benefits	Equal Variances Assumed	-.354	18	.727
	Equal Variances Not Assumed	-.354	17.958	.727

There are no significant differences between the two groups - the results are below 0.5, meaning the differences are not significant. **There is a significant correlation between the answers of the mothers of participants in the experimental group and those of the participants.**

3.2 Qualitative Findings

From analysis of the interviews of the participants and their mothers 4 main themes were found:

- Motivation:..." I want to be good at something"... (Athlete 5)

- Fears and doubts:...” I'm scared of losing, to train so much and lose”... (Athlete 4)
- Benefits...: The program made me better; it was fun. I felt that it helped me in everything...”... (Athlete 2)
- Light at the end of the tunnel:...”I try to go to every training session and that way I get better” (Athlete 1)

CHAPTER 4: CONCLUSIONS

This chapter presents the conclusions of this study, specifies practical implications, limitations of the study, contribution to knowledge, It also puts forward the learning model that resulted from the discussion, and applied recommendations for further research.

4.1 FACTUAL CONCLUSIONS

Factual conclusions that emerged from this study show that improvements in motor skills resulting from participation in the training program are linked first and foremost to the structure of the program and mediation, and are not connected to participants' chronological age, and also affect other areas that are not directly related to the training program such as participants' intrinsic motivation and their relationships with their mothers.

Research results showed that improvement in simple and complex motor skills are linked to activities that are separated into small, intensive, gradual stages, experiential and composed according to principles of working with intellectual disabilities. That is to say, in order to teach motor actions, one must work with the same teaching principles employed to teach theoretical learning material. Another research conclusion illustrated that participating in the learning program was perceived as promoting self-awareness and recognizing strengths and weaknesses using analysis of video films and trainers' mediation and attention to the needs of athletes during the program. In addition, the concrete method of analyzing short films fits one of the principles of working with intellectually disabled people.

Although family forms people's closest circle, research conclusions showed that improving motor skills through a training program is linked to ecological surroundings relevant to participants during the program combined with trainers' mediation. That is to say, in this research, it was not parental influence that improved the quality of motor performance because participants do not live at home and in fact their primary significant surroundings is the hostel in which they reside. Nonetheless, there was still a reciprocal effect between parents and their children and vice versa. This can be seen in the research conclusion that improving motor skills through a training program correlates with a change in parents' perceptions with regard to the improvement of their children's motor abilities and strengthens parents' belief in their intellectually disabled children's abilities. Mothers of participants in the control group expressed lack of faith in the training program and their children's abilities, as did mothers of participants in the experimental group at the start. However, in interviews

and questionnaires given to mothers at the end of the training program, their perceptions had changed radically and the assumption is joint dialogue with their children, their recognition of the program's importance as well as successes they enjoyed throughout the program.

Consequently, another conclusion that emerged from this study is that improvement of motor skill through a program is linked to increased motivation from experiencing success, which is reinforced by receiving positive feedback. Participants underwent a significant process regarding their motivation to participate in the program and win games. From research conclusions, it emerged that participating in the intervention program was initially perceived as an external motivator, but later created intrinsic motivation without the need for external reinforcement. Participation in the training program was also seen as an impetus to feeling a sense of capability and to reinforce successes in future competitions, when in fact it is those issues that gradually, throughout the program, increased participants' intrinsic motivation.

An unexpected benefit at the beginning of the process, but which it became clear, was extremely significant was the social effects. It emerged from research conclusions that participating in the training program was perceived as social empowerment on a personal and world level that affected successes and promoted social connections and as such, increased internal motivation to succeed in games. Over and above social activities and recognizing their importance, participation in the training program was perceived as an opportunity to be 'normal', as an equal part of society, something that does not go without saying amongst people with intellectual disabilities.

Despite recognizing all the program's benefits for participants and their mothers, it was seen that participating in the intervention program was accompanied by fears of failure and sometimes as threatening the quality of their performance. This conclusion emerged in every research cycle and the assumption is that any learning process, theoretical or motor will be accompanied by anxiety and fear especially with reference to a population with intellectual disabilities.

4.2 CONCEPTUAL CONCLUSIONS

On the conceptual level, the research conclusions allow the emergence of a new construct for understanding table tennis training within SO. The new construct was conceptualized into an evidence-based model that shows how an integration of the components involved in the training program creates a synergy that can promote table tennis motor skills among SO athletes. Figure 3 presents the model.

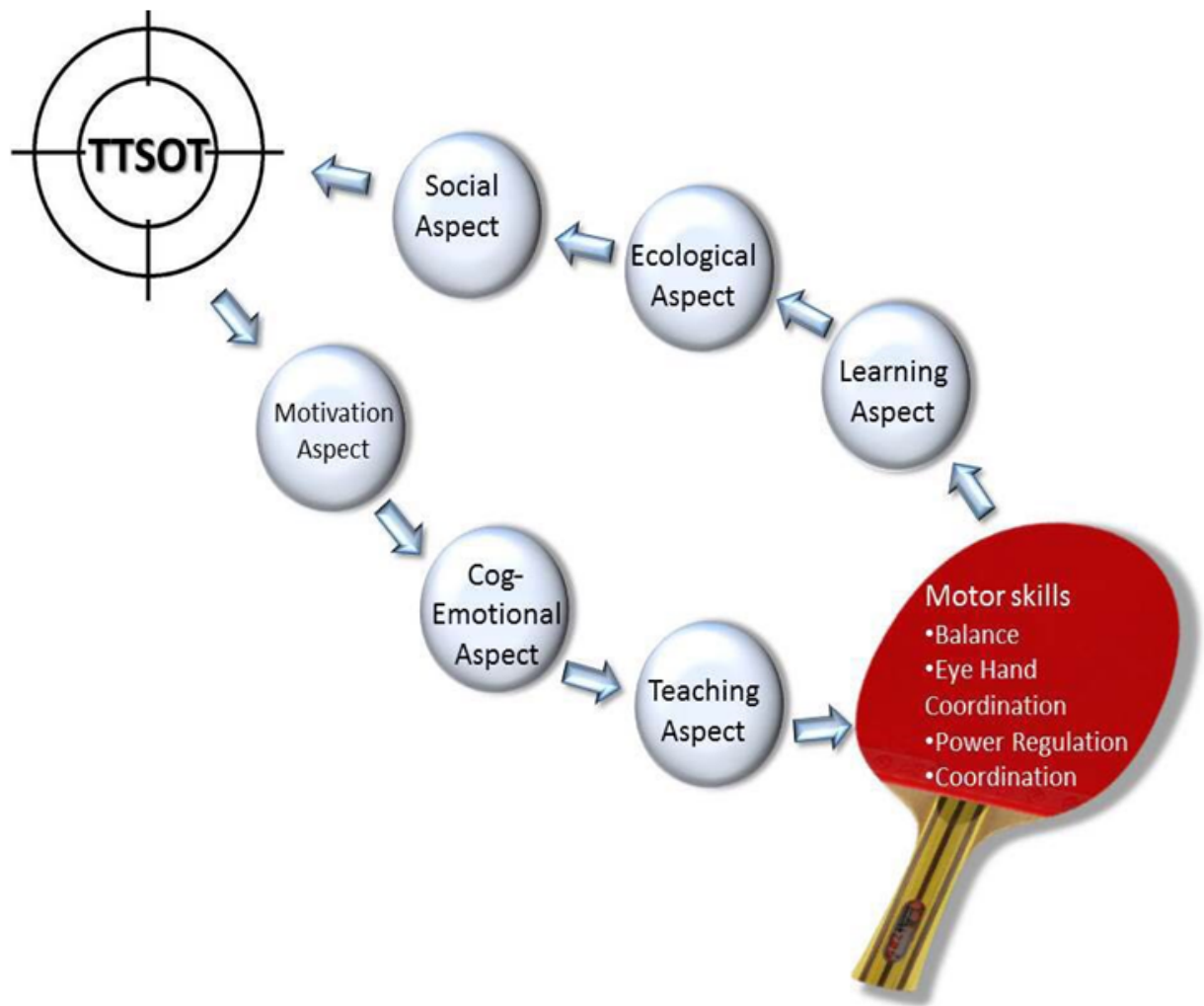


Figure 3 : Special Olympic table tennis training program: A new construct for viewing TTSOT model

The TTSOT model shows that improving motor skills including balance, hand-eye coordination, power regulation and coordination, can be promoted using **teaching** strategies based on mediation through demonstration and visualization. Additionally, by integrating active learning and experiential teaching, SO athletes receive an experience of learning based on success.

In addition, the model presents **learning aspects** based on experiential learning, active learning and gradual learning from the simple to more difficult, and when every action is divided into sub-actions. All these empower learners' participation in the process and as such make these athletes learning process more profound. Another component of the TTSOT model deals with the **cognitive-emotional aspect** related to the proposed program. As well as athletes and trainers composing a significant part of the model, another very practical component for the target population is proposed. The cognitive-emotional aspect is expressed when analyzing the short films - this stage demands cognitive abilities in order to understand them, combined with demonstrations that support the cognitive part. In addition, legitimate fear of failure is

a cognitive component due to the ability to understand that athletes fear failure, and refers to the emotional aspect of fear. However both are legitimate and part of any training program. It is the environment that influences athletes' progress, and this is the reason why the **ecological aspect** is significant in the TTSOT model, by emphasizing the choice of an environment relevant and close to athletes in order to create improvement and progress in desired skills - combining a relevant ecological environment. This and previous aspects are likely to increase the **motivational aspect** and increase athletes' intrinsic motivation even if they started the process with extrinsic motivation and only the desire to win a prize. The social aspect is also significant in the TTSOT model and is based on the desire to be 'normal' as well as to develop social connections as an accompanying aim of participating in a training program.

4.3 PRACTICAL IMPLICATIONS

- The proposed model allows using teaching principles such as analyzing film, in other programs related to other sports areas.
- The model proposed in this research allows implementing the tools given to parents to carry out motor actions at home in order to strengthen their relationships with their children, and to improve motor skills.
- The model proposed in this research allows implementing theoretical learning principles such as breaking down what needs to be learned into small parts, in teaching motor skills that are critical for intellectually disabled people.
- The proposed model can be part of a learning program in any educational framework from an early age to 21 years old. In addition, it can form the basis of training for the national table tennis team in Israel and worldwide.
- The proposed model is interdisciplinary. Therefore it can be taught at seminars to physical education teachers who specialize in special education, at special education seminars as well as seminars for movement teachers.
- Parts of the proposed model can form the basis for working on intrinsic motivation for intellectually disabled people in many and diverse physical training areas.

4.4 CONTRIBUTION TO KNOWLEDGE

The current study's contribution to theoretical knowledge is based on the fact that it is the first study that proposes a training program in table tennis for intellectually disabled people training for the Special Olympics and examines the effects of four sporting skills. Until now, athletes had trained only at the table, in routine training, whereas this program is innovative in its combination of various components which all lead to improvements in program participants' motor abilities. That is to say that today there are theoretical teaching programs for intellectually disabled people, as well as teaching programs for motor activity, within the Ministry of Education's curriculum framework, but there is no integrated program - ecologic and interdisciplinary assisted by varied disciplines such as Feuerstein's theory of

mediated learning (1979), sensory integration theory, principles of working with intellectually disabled people and more. All this in order to reach achievements in motor skills. This interdisciplinary integration is new in the theoretical research field. That is to say that this study has added to existing knowledge in Feuerstein's mediation theory through its application to physical education amongst intellectually disabled SO athletes.

A further contribution to theoretical knowledge is expressed in this research by participants who have medium intellectual disabilities. The research field with this population is very narrow. As such, this study closed a gap in knowledge in this area. This and more, studies undertaken with this population have mostly examined cognitive change abilities in adults. That being the case, the conclusions of this research are innovative in that adults with medium intellectual disabilities can even learn motor skills at an adult age and not just cognitive skills. It is possible to say that this research is innovative.

The current study is innovative in that people with medium intellectual disabilities can even enjoy intensive and not simple training in that trainers use active learning, illustrations, reinforcement, breaking tasks down, analyzing short films that demand cognitive abilities in order to improve motor performance skills.

This research contributes to knowledge in the field of motivation in that its conclusions show that intellectually disabled people can act both from extrinsic motivation - desire to win prizes and intrinsic motivation without the need for external reinforcement.

Another contribution to theoretical knowledge is expressed in the area of the ecological system. Research findings showed that parents activating the program at home does not contribute to participants' motor skills advancing. The significant innovation in this area is at the base of an assumption that the closest, most relevant environment for a person at a particular time, is the one that affects him/her the most and not family as described by Bronfenbrenner (1979) in his model. This conclusion is likely to help staff in education in general and physical education in particular, in planning any program for an intellectually disable population or any other population. Moreover, this conclusion can serve people who work in social work or any other therapeutic field. That is to say that contribution to knowledge was also made in the fields of physical education and special education curricula.

Another theoretical significance is that this program can be implemented in special education schools. The research can help to understand how a training program can improve specific skills included in the program, such as hand-eye coordination, coordination, balance and power regulation, in people with intellectual disabilities.

A practical contribution to knowledge is building a unique training model for intellectually disabled people, adjusted to their needs, abilities, awakening their intrinsic motivation, strengthening their relations with their families, helping to develop their social skills and based on principles of working with this population. This model can be applied both in private and group training and still achieve the

same goals.

Another practical contribution is to the worldwide Special Olympics Association in which many thousands of intellectually disabled people participate. The association can use the model proposed in this research to advance beginners who are interested to enter competitions in this area.

Finally, the model derived from this research can lead to a change in perceptions of physical education for intellectually disabled people and as such to planning training programs in other physical activities.

4.5 LIMITATIONS

There are a number of limitations in this research despite attempts to reduce them. This section will describe these limitations.

Research population - since this refers to a population of adults aged 30 and above with medium intellectual disabilities who participate in Special Olympics table tennis, it was made up of ten participants in the experimental group and ten in the control group. Since there are not many Special Olympic participants in general and table tennis in particular in Israel, the research populations was limited.

Research tools - Since this is the first study of this kind in this area in Israel or worldwide, no suitable tools existed to examine the motor skills examined in it or on which the training program was based. The tests were validated by eleven experts. In order to minimize the tool's limitation, a pilot with ten participants was undertaken and its results showed that it was possible to use this tool for this study.

In addition, this is the first study based on the construction of a training program that works on a number of table tennis skills for intellectually disabled people. In order to minimize the limitations, a pilot with three participants, constituting 30% of the total number of participants in the experimental group, and after a month of training interviews were carried out in order to identify points that needed to be changed. Conclusions from the pilot helped change the training program prior to its implementation.

Generalizability - since this is the first study of its kind in Israel and worldwide, it is impossible to compare it with similar studies in the field. In order to minimize this limitation, studies carried out with intellectually disabled people as well as table tennis studies were reviewed. In addition, information was triangulated with a few studies that have been undertaken with intellectually disabled people in table tennis. Another means of minimizing this limitation was to use mixed method research methodology in order to validate the findings in the quantitative and qualitative parts.

4.6 FUTURE RESEARCH

It is recommended that this subject be further investigated according to the following suggestions:

- To test implementing the principles of the TTSOT model on other physical activities based on similar motor skills in the SO field, such as bowling or

bouche.

- Longitudinal research that examines the ability to generalize implementation and the ability to retain principles learned in training.
- Activate program for younger people and examine their abilities to change.
- Research examining the correlation between newly learned motor skills and their influence on participants' intelligence.

REFERENCES

- Almosni, Y., Raiter, S., & Ben Sira, D. (2005). The impact of different teaching styles on quality of life of young people with mild and moderate mental retardation. *Bitnua: Journal of Science Physical Education and Sport*, 7(3-4), 139-176.
- Almosani, Y. (2007). "Jumping the Stairs"—The influence of engaging in physical activity on improving the quality of life of youngsters with moderate and light mental disability. *Issues in Special Education and Rehabilitation*, 22(1) 19–40 (Hebrew).
- Alpert, B. (2001). Writing qualitative research. In Tzabar Ben Yeshua (Ed.), *Traditions and trends in qualitative research*. Tel Aviv: Dvir (Hebrew).
- Alpert, B. (2010). Combining qualitative and quantitative Analysis? studies. *Data Analysis in Qualitative Research* (pp. 333-357).
- Arskey, H., & Knight, P. (1999). *Interviewing for social scientists*. London: Saga Publications.
- Atkinson, J. W. (1974). The mainsprings of achievement-oriented activity. In J. W. Atkinson & J. O. Raynor (Eds.), *Motivation and Achievement* (pp. 13-41). New York: Halstead.
- Ayers, A. J. (1972). *Sensory integration and the child*. Los Angeles: Western Psychological Services.
- Ayers, J. (1991). *Sensory integration and learning disorders*. Los Angeles: Western Psychological Services.
- Bar-Shalita, T., Vatine, J. J., & Parush, S. (2008). Sensory modulation disorder: A risk factor for participation in daily life activities. *Development Medicine and Child Neurology*, 50(12), 932-937.
- Barulli, D., & Stern, Y. (2013). Efficiency, capacity, compensation, maintenance, plasticity: Emerging concepts in cognitive reserve. *Trends in Cognitive Sciences*, 17(10), 502-509.
- Beck, R. C. (2000). *Motivation: Theories and principles* (4th ed.). Upper Saddle River, NJ: Prentice-Hall.
- Ben-Sira, D., Reiter, S., & Almosani, Y. (2005). The influence of different physical education teaching styles on the quality of life of youngsters with moderate and light mental disability. *Bi'Tnua: Physical Education and Sports Journal*, 7(3-4), 139-176 (Hebrew).
- Berger, S. (2004). *The developing person through the lifespan*. 6th edition. Upper Saddle River, NJ: Prentice-Hall.
- Boisseau, E., Scherzer S., & Cohen H. (2010). Hand-eye coordination in aging and in Parkinson's Disease. *Aging, Neuropsychology, and Cognition: A Journal on Normal and Dysfunctional Development*, 9(4), 266-275.

- Boyce, A. B. (1992). Making the case for the case-method approach in physical education pedagogy classes. *Journal of Physical Education, Recreation and Dance*, 6, 17-20.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press. 16-85.
- Brody, H. (1980). Social Motivation. *Annual Review of Psychology*, 31, 143-168.
- Bundy, A. C., Lanes, S. J., & Murray, E. A. (Eds.). (2002). *Sensory integration: Theory and practice*. Philadelphia: F. A. Davis.
- Campbell, K. B., & Noldy-Cullum, N. (1985). Mental chronometry: Vol. II. Individual differences, in B. D. Kirkcaldy (Ed.), *Individual differences in movement* (pp. 147-167). Lancaster: MTP Press.
- Charlop-Christy, M., Carpenter, M., Lec, L., Leblanc L., & Kellet, K. (2002). Using the picture exchange communication system (PECS) with children with autism: Assessment of PECS acquisition, speech, social-communicative behavior, and problem behavior. *Journal of Applied Behavior Analysis*, 35(3), 213–231.
- Clandinin, D. J., Pushor, D., & Orr, A. M. (2007). Navigating sites for narrative inquiry. *Journal of Teacher Education*, 58(1), 21-35.
- Clandinin, J. (Ed.). (2007). *Handbook of narrative inquiry: Mapping a methodology*. California: Sage Publications.
- Collinson, V., & Killeavey, M. (1999). Exemplary teachers: Practicing an ethic of care in England, Ireland and the United States. *Journal for a Just and Caring Education*, 5(4), 349-367.
- Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case of nature and nurture. *American Psychologist*, 55, 218-232.
- Conroy, D. E., Poszwaradoeski, A., & Henschen, K. P. (2001). The Evaluative criteria and consequences associated with failure and success for elite athletes and performing artists. *Journal of Applied Sport Psychology*, 13, 300-322.
- Convington, V. (2000). Goal theory motivation and school achievement: An integrative review, *Annual Review of Psychology*, 51, 171-200.
- Cowley, P. M., Ploutz-Snyder, L. L., Baynard, T., Heffernan, K., Jae, S. Y., Hsu, S., (2010). Physical fitness predicts functional tasks in individuals with Down syndrome. *Medicine and Science in Sports and Medicine*, 42(2), 388–393.
- Cratty, B. J. (1972). *Physical expressions of intelligence*. Englewood Cliffs, NJ: Prentice Hall.
- Cratty, B. J. (1984). *Psychological preparation and athletic excellence*. New York: Movement Publications.
- Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Saddle River, NJ: Pearson Education.
- Creswell, J. W. (2013). *Research design*. UK: Sage Publications.

- Cuesta-Vergas, A. I., Paz-Lourido, B. P., & Rodriguez, A. (2011). Physical fitness profile in adults with intellectual disabilities: Differences between levels of sport practice. *Research in Developmental Disabilities, 32*, 788-794.
- Cox, A. H., Marshall, E. S., Mandelco, B., & Olsen, S. F. (2003). Coping responses to daily life stressors of children who have a sibling with a disability. *Journal of Family Nursing, 9*, 397-413.
- Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum.
- Denzin, N. K., & Lincoln, Y. S. (2011). The Sage handbook of qualitative research. UK: Sage Publications.
- Dibner, A. S., & Korn, E. J. (1969). Group administration of the Bender Gestalt Test to predict early school performance. *J. Clin. Psychol., 25*, 263-8.
- Doshnik, L., & Tzabar Ben Yehoshua, N. (2001). Ethics of qualitative research. In N. Tzabar Ben Yehoshua (Ed.), *Traditions and qualitative research streams*. Lod: Dvir.
- Dunn, J. M., & Leitschuh, C. (2005). Special physical education. 8th ed. Dubuque (IA): Kendall/Hunt.
- Dunn, W. (2008). Living sensationally: Understanding your senses. London: Jessica-Kingsley Publisher.
- Egozi, M., & Feurstein, R. (1987). The theory of mediated learning and its place in teacher training. *Dapim, 6*, 16-34 (Hebrew).
- Eilam, G. (2000). Learning and development multi theories, Possible worlds. Education and Thinking. *Jerusalem: branco vice, 19*, 68-79 (Hebrew).
- Elbaz-Lufish, F. (2001). Biographical-narrative research in education and teaching. In N. Tzabar Ben Yeshua (Ed.), *Traditions and trends in qualitative research* (pp. 166-141). Tel Aviv: Dvir.
- Emons, P., & Anderson, L. (2008). Sensory disability: Learning, development & sensory disabilities on the autism spectrum, learning disabilities & bipolar disorder. Kiryat-Bialik: AH.
- Facon, B. (2008). A cross-sectional test of the similar-trajectory hypothesis among adults with mental retardation, *Research in Developmental Disabilities, 29*(1), 29-44.
- Facon, B., & Facon-Bollengier, T. (1997). Chronological age and Peabody picture vocabulary test performance of persons with mental retardation: New data. *Psychological Reports, 81*(3 Pt. 2), 1232-1234.
- Facon, B., & Facon-Bollengier, T. (1999). Chronological age and crystallized intelligence of people with intellectual disability. *Journal of Intellectual Disability Research, 43*(6), 489-496.
- Feuerstein, R. (1991). The theory of structural cognitive modifiability. In B. P. Presseisen (Ed.), *Thinking and learning styles: Classroom interactions*. Washington, DC: National Educational Association.
- Feuerstein, R. S. (1997). The coherence of the theory of modifiability. In A. Kozulin (Ed.), *The ontogeny of cognitive modifiability*. Jerusalem: ICELP.

- Feuerstein, R. S. (1999). Deficient cognitive functions as the teacher's tool. In D. Tzuriel (Ed.), *Mediated learning experience*. Kiriat Bialik: Ach Publishers (Hebrew).
- Feuerstein, R., & Feuerstein, R.S. (1991). Mediated learning experience: A theoretical review. In R. Feuerstein, P. S. Klein, & A. J. Tannenbaum (Eds.), *Mediated learning experience (MLE)* (pp. 3-52). London and Tel Aviv: Freund.
- Feuerstein, R., Feuerstein, R. S., & Gross, S. (1997). The learning potential assessment device. In D. P. Flanagan, J. J. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment* (pp. 297-313). New York and London: Guilford Press.
- Feuerstein, R., Feuerstein, R. S., & Schur, Y. (1997). Process as content in regular education and in particular education of the low functioning retarded performer. In A. L. Costa & R. M. Liebmann (Eds.), *If process were content: Sustaining the spirit of learning*. Thousand Oaks, CA: Corwin.
- Feuerstein, R., Feuerstein, R. S., & Schur, Y. (1999). IE, Developmental stages in the program and its application. In Elad Peled (Ed.), *Fifty years of Israeli Education Ministry of Defence*. Jerusalem, Israel (Hebrew).
- Feuerstein, R., Klein, P. S., & Tennenbaum, A. (1991). Mediated learning experience (M.L.E).
- Feuerstein, R., Minzkeri, Y., & Ben Shahar, N. (1993). A guide for parents—Mediated learning experience. Hadasa Vizo International Center for Enhancement of Learning, Jerusalem (Hebrew).
- Feuerstein, R., Rand, Y., & Hoffman, M. (1997). The dynamic assessment of retarded performers: The learning potential assessment device. Baltimore, MD: University Park Press.
- Feuerstein, R., Rand, Y., & Hoffman, M. (1979). Cognitive modifiability in retarded adolescents: Effects of instrumental enrichment. *American Journal of Mental Deficiency*, 83: 539–550.
- Firestone, W. A. (1993). Alternative arguments for generalizing from data as applied to qualitative research. *Educational Researcher*, 22(4), 16-23.
- Fisher, M. A., & Zeaman, D. (1970). Growth and decline of retardate intelligence. In N. R. Ellis (Ed.), *International Review of Research in Mental Retardation*, 4 (pp. 151-191). New York: Academic Press. doi:10.1016/S0074-7750(08)60024-5.
- Foley, J. M. (2012). Cognitive reserve as a protective factor in order HIV-positive patients at risk for cognitive decline. *Appl. Neuropsychological.*, 19, 16-25.
- Franciosi, E., Baldari, C., Gallotta, M. C., Emerenziani, G. P., & Guidetti, L. (2010). Selected factors correlated to athletic performance in adults with mental retardation. *Journal of Strength and Conditioning Research*, 24(4), 59-64.
- Freeman, M. (2007). Autobiographical understanding and narrative inquiry. In J. Clandinin (Ed.), *Handbook of narrative inquiry: Mapping a methodology* (pp. 120-145). California: Sage Publications.
- Freeman, M. (2007). Life "on holiday"? In defense of big stories. In M. Bamberg (Ed.), *Narrative—State of the art* (pp. 155-163). Amsterdam: John Benjamins.

- Gergen, M. M., & Gerhen, K. J. (2000). Qualitative inquiry: Tensions and transformations. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research (2nd ed.)* (pp. 1025-1046). Thousand Oaks, CA: Sage.
- Geron, E. (1996). Intelligence of child and adolescent participants in sports. In *The child and adolescent athlete, Vol. 6*. Oxford: Blackwell Science Ltd.
- Geron, A., Raviv, S., & Lidor, R. (2010). Motivation for physical activity and sport. Mofet: School for research and development programs for the training of teachers and teaching colleges, Tel Aviv, Israel (Hebrew).
- Gibson, J. C., Temple V. A., Anholt, J. P., & Gaul, C. A. (2011). Nutrition needs assessment of young Special Olympics participants. *Journal of Intellectual and Developmental Disability, 36*(4), 268-272.
- Gillespie, M. (2008). Participation patterns in an urban Special Olympics program. *British Journal of Learning Disabilities, 37*, 21-27.
- Glidden, L. M., Bamberger, K. T., Draheim, A. R., & Kersh, J. (2011). Parent and Athlete perceptions of Special Olympics participation: Utility and danger of proxy responding. *Journal of Intellectual and Developmental Disability, 49*(1), 37-45.
- Gorman, D. R., Zody, J. M., Rrown, B. S., Debrezze, R., & Edwards, W. H. (1990). Multivariate relationships of IQ with motor performance in children referred to a diagnostic motor development clinic. *Clic, Kinesioogy 44*, 107-10.
- Guidetti, L., Franciosi, M., Gallotta, M. C., & Emerenziani, G. P. (2010). Could sport specialization influence fitness and health of adults with mental retardation? *Research in Developmental Disabilities, 31*, 1070-1075.
- Gregory, C., & Christophe, M. (2007). Long-term effects of athletics meet on the perceived competence of individuals with intellectual disabilities. *Research in Developmental Disabilities 28*, 176-186.
- Hadadian, A. (1994). Stress and social support in fathers and mothers of young children with and without disabilities. *Early Education & Development, 5*, 226-235.
- Hakak, Y., Kasan, L., & Kromer Nevo, M. (2001). All measurements? Critical views on scaling and quantification (pp. 9-87). Beer Sheva: Ben Gurion University (Hebrew).
- Hardy, J. P., & Fazy, J. A. (1987). The inverted U hypothesis—A catastrophe for sports psychology and a statement for a new hypothesis. Paper presented at a meeting of the NASPSPE, Vancouver, Canada.
- Harvey, S. J. (2005). Why did you do that? An economic examination of the effect of extrinsic compensation on intrinsic motivation and performance. *Journal of Economic Psychology, 26*, 549-566.
- Hayakawa, K., & Kobayashi, K. (2011). Physical and motor skill training for children with intellectual disabilities. *Perceptual and Motor Skills 112*(2), 573-580.
- Haywood, H. C., & Switzky, H. N. (1992). Ability and modifiability: What? How? And how much? In J. S. Carlson (Ed.), *Advances in cognition and educational practice: Vol. 1a. Theoretical issues: Intelligence, cognition and assessment* (pp. 25-85). Greenwich, CT: JAI Press.

- Heller, T., Miller, A. B., Hsieh, K., & Sterns, H. (2000). Later-life planning: Promoting knowledge of options and choice-making. *Mental Retardation*, 38(5), 395-406.
- Hemayattalab, R., & Movahedi, A. (2010). Effects of different variations of mental and physical practice on sport skill learning in adolescents with mental retardation. *Research in Developmental Disabilities*, 31, 81-86.
- Hild, U., Hey, C., Baumann U., Montgomery, J., Euler, H. A., & Neumann, K. (2008). High prevalence of hearing disorders at the Special Olympics indicate need to screen persons with intellectual disability. *Journal of Intellectual Disability Research*, 52(6), 520-528.
- Hotzler, Y. (2004). Psychological-social empowerment among persons with disabilities via physical activity. Motor behavior: Psychological and sociological aspects. Jerusalem: Hebrew University: Magnes Publications (Hebrew).
- Hozler, Y. Oz, M., & Barak, S. (2013). Motivation for physical activity among athletes with intellectual disabilities participate in developmental activities—Organizing Special Olympics athletes without disabilities. Wingate: Israel (Hebrew).
- Hutzler, Y., & Shoshni, R. (1995). Physical education in special schools and kindergartens in Israel: Available and desirable situation. *Journal of Physical Education & Sport Sciences*, 101-122.
- Ifalah, T. (2003). Behavior is a language—Modern family situations. Relationships? between parents and children's. Ravgon (Hebrew).
- Isbell, C. (2011). Sensory integration: A guide for personal teachers. Kiryat-Bialik: ACH (Hebrew).
- Jorgensen, D. L. (1989). Participant observation: A methodology for human studies. London: Sage Publications.
- Kacen, L., & Krummer-Nevo, M. (2010). Data analysis in qualitative research. Beer-Sheba: Ben Gurion University (Hebrew).
- Kaplan, A., & Asor, A. (2001). Motivation to learn at school—Theory and practice. *Hinuch Hahashiva*, 20, 7-30 (Hebrew).
- Karp, K., & Howell, P. (2004). Building responsibility for learning in students with special needs. *Teaching children mathematics*, 11(3), 118-126.
- Kashti, Y., Alpert, B., Yossifon, M., & Manor, A. (1997). Heterogeneous school: Unity in diversity. Tel Aviv: Ramot.
- Kassan, L., & Krommer Nevo, M. (2010). Data analysis in qualitative research. Beer Sheva: Ben Gurion University.
- Katz, I., Assor, A., & Kanat-Maymon, Y. (2008). A projective assessment of autonomous motivation in children: Correlational and experimental evidence. *Motivation and Emotion*, 32, 109–119.
- Katz, I., Buzukashvili, T., & Feingold, L. (2012). Homework stress: Construct validation of a measure. *Journal of Experimental Education*, 80(4), 405–421.

- Katz, I., & Cohen, R. (2014). Assessing autonomous motivation in students with cognitive impairment. *Journal of Intellectual and Developmental Disability* .
- Katz, I., Eilot, K., & Nevo, N. (2014). “I’ll do it later”: Type of motivation, self-efficacy and homework procrastination. *Motivation and Emotion*, 38, 111-119.
- Katz, I., Kaplan, A., & Buzukashvily, T. (2011). The role of parents’ motivation in students’ autonomous motivation for doing homework: The importance of parents’ motivation and behavior. *Learning and Individual Differences*, 21, 376–386.
- Katz-Oppenheimer, R. (2001). Socialization—from childhood to adulthood. Tel Aviv: Ma'alot Publications (Hebrew).
- Kazenelson, A. (2005). What's between parents and children: Psychology of parents and children. Amihai (Hebrew).
- K. Yin, Robert. (2003). Case study research—Design and methods (pp. 1-106). London: Sage Publication.
- Lavian-Elul, N., & Carmon, S. (2008). Senses and meetings in movement: Developing movement actions & practical in movement with babies and children. Tel Aviv: Lior (Hebrew).
- Lazaros, R. C. (1991). Emotion and adaptation. New York: Oxford University Press.
- Lejcarova, A., (2009). Coordination skills in 9 To 11 year old pupils at practical elementary schools in relation to their degree of intellectual disability. *Acta Univ. Palacki. Olomuc., Gymn.* 39(4), 53-62.
- Lieblich, A., Tuval Mashiah, R., & Zilber, T. (1998). Narrative research: Reading, analysis and interpretation. California: Sage Publication.
- Lifshitz, H., & Rand, Y. (1999). Cognitive modifiability in adult and older people with mental retardation. *Mental Retardation*, 37(2), 125-138.
- Lifshitz, H., & Tzuriel, D. (2004). Durability of effects of instrumental enrichment in adults with intellectual disabilities. *Journal of Cognitive Education and Psychology*, 3(3), 297-322.
- Lifshitz, H., Tzuriel, D., & Weiss, I. (2005). Effects of training in conceptual versus perceptual analogies among adolescents and adults with intellectual disability. *Journal of Cognitive Education and Psychology*, 5(2), 144-170.
- Lifshitz, H., & Katz, Y. J. (2009). Religious concepts among individuals with intellectual disability: A comparison between adolescents and adults. *European Journal of Special Needs Education*, 24(2), 183-201.
- Lifshitz, H., & Klein, P. S. (2010). Effects of MISC intervention on cognition, autonomy, and behavioral functioning of adult consumers with severe intellectual disability. *Research in Developmental Disabilities*.
- Lifshitz, H., Weiss, I., Tzuriel, D., & Tzemach, M. (2011). New model of mapping difficulties in solving analogical problems among adolescents and adults with intellectual disability. *Research in Developmental Disabilities*, 32(1), 326-344.
- Lifshitz, H. (2015). Compensation age theory (CAT): Effect of chronological age on individuals with intellectual disability.

- Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research (2nd ed.)* (pp. 163-188). Thousand Oaks, CA: Sage.
- Luckasson, R., Borthwick-Duffy, S., Buntinx, W. H. E., Coulter, D. L., Craig, E. M., & Reeve, A. (2002). *Mental retardation: Definition, classification, and systems of support (10th ed.)*. Washington, DC.
- Maclean, W. E. (2009). Special Olympics: The rest of the story. *Research & Practice for Persons with Severe Disabilities, 33*(3), 146-149.
- Mason, J. (1996). *Qualitative researching*. London: Sage Publication.
- Thomas, G. (2012). Case study—A guide for students & researchers. 1-158. California: Sage Publication.
- Meghann, L., Viviene, A. T., & John, F. (2012). International BMI comparison of children and youth with intellectual disabilities participating in Special Olympics. *Research in Developmental Disabilities, 33*(6), 1708-1714.
- Merric, E. (1999). An Exploration of quality in qualitative research. In M. Kopala & L. A. Suzuki (Eds.), *Using qualitative methods in psychology* (pp. 25-36). London: Sage Publications.
- Nahmias, D., & Nahmias, H. (1998). *Research methods in social sciences*. Tel Aviv: Am Oved.
- Nettlebeck, T., & Kirby, N. H. (1983). Measures of timed performance and intelligence. *Intelligence, 7*, 39-52.
- Ninot, G., & Maiano, C. (2007). Long-term effects of athletics meet on perceived competence of individuals with intellectual disabilities. *Research in Development Disabilities, 28*, 176-186.
- Nissim, D., Aminadav, H., Sheyms, M., & Bromman, A. (2010). *Intellectual disability: Definition, classification and systems of support*. Kiryat Bialik: Ah.
- Nyberg, I. (2012). Memory aging and brain maintenance. *Trends Cognitive Science, 16*, 292-305.
- Orsmond, G. I., & Seltzer, M. M. (2007). Siblings of individuals with autism spectrum disorders across the life course. *Mental Retardation and Developmental Disabilities Research Reviews, 13*, 313-320.
- Pasternak, R. (2002). *The educating family—Greenhouse or trap?* Tel Aviv: Itav Publications (Hebrew).
- Piaget, J. (1953). *The origins of intelligence in children*. London, UK: Routledge and Kegan Paul.
- Piaget, J., & Inhelder, B. (1972). *The psychology of the child*. Tel-Aviv: Hapoalim (Hebrew).
- Pipoll, H., & Fleurance, P. (1988). What does keeping one's eye on the ball mean? *Ergonomics, 31*, 1647-1654.
- Plibel, J. H. (1970). *The developmental psychology of Jean Piaget*. Tel-Aviv: Ozar Hamore (Hebrew).

- Poletti, M. (2011). Mild cognitive impairment and cognitive reserve in Parkinson's disease. *Parkinsonism Relat. Disorers* 17, 579-586.
- Porretta, D. L., & Moore, W. (1997). A review of sport psychology research for individuals with disabilities: Implications for future inquiry. *Clinical Kinesiology*, 50(4), 83-93.
- Raab, M., Masters, R., & Maxwell, J. (2005). Improving the 'how' and 'what' decisions of elite table tennis players. *Human Movement Science*, 24(3), 326-344.
- Rasool, H., & Ahmadreza, M., (2010). Effects of different variation of mental and physical practice on sport skills learning in adolescents. *Research in Developmental Disabilities*, 31(1), 81-86.
- Reid, G. (2003). Defining adapted physical activity. In R. D. Steadward, G. D. Wheeler, & E. J. Watkinson (Eds.), *Adapted physical activity* (pp. 11-25). Edmonton, Canada: University of Alberta Press.
- Reiss, S., & Havercamp, S. M. (1998). Toward a comprehensive assessment of fundamental motivation: Factor structure of the Reiss profiles. *Psychological Assessment*, 10(2), 97-106
- Reiter, S. (2002). Between life competencies and the "skill of living". *Issues in Special Education and Rehabilitation*, 17(2), 17-36 (Hebrew).
- Reykowski, J. (1982). Social Motivation. *Annual Review of Psychology*, 33, 125-154.
- Richardson, L. (1997). *Fields of play: Constructing an academic life*. New Brunswick, NJ: Rutgers University Press.
- Rimmer, J. H. (2006). Use of the ICF in identifying factors that impact participation in physical activity/rehabilitation among people with disabilities. *Disability and Rehabilitation*, 28, 1087-1095.
- Robertson, J., & Emerson, E. (2010). Participation in sports by people with intellectual disabilities in England: A brief report. *Journal of Applied Research in Intellectual Disabilities*, 23, 616-622.
- Robinson, N. M., Zigler, E., & Gallagher, J. J. (2000). Two tails of the normal curve: Similarities and differences in the study of mental retardation and giftedness. *American Psychologist*, 55, 1413-1424.
- Rodrigues, S. T., Vickers, J. N., & Williams, A. M. (2002). Head, eye and arm coordination in table tennis. *Journal of Sport Science*. 187-200
- Ronen, H. (2005). *Mental retardation: study, work and teaching methods*. Kiryat Bialik: AH (Hebrew).
- Ronen, H. (2007). Major issues of mental retardation. *Issues in Special Education and Rehabilitation*, 22, 13-18 (Hebrew).
- Rowan, J. (2001). The humanistic approach to action research. *Handbook of action research. Participative inquiry & practice*.
- Rubin, O., & Schreiber-Divon, M. (2014). Mothers of adolescents with intellectual disabilities: The "meaning" of severity level. *Psychology*, 5(6), 587-594.
- Rumsey, D. (2010). *Statistics essentials for dummies* (4th ed.) (pp. 45-54). Hoboken, NJ and Indianapolis, Indiana: Wiley Publishing.

- Tzabar Ben Yeshua, N. (1997). Qualitative research on teaching and learning (pp. 10-150). Tel Aviv: Massada (Hebrew).
- Tzabar Ben Yeshua, N. (1997). Traditions and trends in qualitative research (pp. 1-200). Lod: Dvir (Hebrew).
- Schneizer, S. (2015). Effect of depth of cut on the acquisition of verbal metaphors and visualisation in adolescents and adults with intellectual disabilities with and without Down syndrome. Ph.D dissertation. Ramat Gan, Bar Ilan University (Hebrew).
- Schule K., & Huber, G. (2004). Essentials of sport therapy [Grundlagen der Sporttherapie], 2nd ed. Munich: Elsevier, Urban, & Fischer.
- Schreiber-Divon, M. (2003). Effect program "in preparation for the future," the old woman readiness and quality of life among adults with cognitive disabilities. MA thesis. Ramat Gan: Bar-Ilan University, School of Education (Hebrew).
- Sever, R. (2005). The role of qualitative research paradigms in grounding evidence for decision-makers in the education system. *Shvilei Mehkar*, 12, 24–28 (Hebrew).
- Shai A., & Bar Shalom, Y. (2002). Qualitative research in the study of education. Jerusalem: College of Education David Yallin.
- Shefler, G. (2008). Researcher's professional identity. *Shvilei Mehkar*, 15, 81-73.
- Shimoni, S., & Levin, A. (2002). Everyone thinks differently. Tel Aviv: Mofet.
- Shkedi, A. (2003). Words that try to touch—Qualitative research—Theory and practice (pp. 23-242). Tel Aviv: Tel Aviv University.
- Shkedi, A. (2004). Words of meaning—Qualitative research—Theory and practice. Tel Aviv: Tel Aviv University: Ramot (Hebrew).
- Shkedi, A. (2010). Narratives grounded theory: Theory building in qualitative research. In L. Kassin & M. Krommer Nevo (Eds.) (pp. 461-436). Beer Sheva: Ben Gurion University.
- Shlaski, S., & Alpert, B. (2007). Ways of writing a qualitative research—Dismantling reality structuring text (pp. 214-219) Tel Aviv: Mofet (Hebrew).
- Shoval, E., & Talmor, R. (2004). Physical activity in curriculum aimed at coping with a range of school problems: Analysis of coherent elements. *Movement: Journal of Physical Education & Sport Sciences*, 7-37.
- Silva, P. A., McGee, & Williams, S. (1982). Prospective study of the association between delayed motor development at ages three and five and low intelligence and reading difficulties at age seven: A report from the Dunedin multidisciplinary child development study. *J. Hum. move. Stud.*, 8, 187-93.
- Simons, H. (1996). The paradox of case study. *Cambridge Journal of Education*, 26(2), 225-240.
- Sindik, J., & Kondric, M. (2013). Differences in indexes and variables directly arising from the results of a table tennis competition in two different seasons. *Acta Kinesiologica*, 7(1), 32-38.
- Singer, R. N. (1968). Interrelationship of physical perceptual-motor and academic variables in elementary school children. *Percept. Motor Skills*, 27, 1323-32.

- Singer, R. N. (1984). What do children want in youth sport? In H. Reider (Ed.), *Sport Psychology International* (pp. 115-26). Koln: B.P.S. Verlag.
- Singer, R. N., & Orbach, I. (1999). Persistence, excellence and fulfillment. In R. Lidor & M. Bar-Eli (Eds.), *Sport psychology: Linking theory and practice* (pp. 167-190). Morgantown, WV: Fitness Information Technology.
- Smith, G., Cahn, A., & Ford, S. (2010). Sports commerce and peace: The special case of Special Olympics. *Journal of Business Ethics*, 89(4), 587-602.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stake, R. E. (2000). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research (2nd ed.)* (pp. 435-454). Thousand Oaks, CA: Sage.
- Stake, R. E. (2005). Qualitative case studies, in N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research (3rd ed.)*. Thousand Oaks, CA: Sage.
- Stern, Y., Habeck, C., Moeller, J., Scarmeas, N., Anderson, K. E., Hilton, J., Flynn, J., Sackeim, H., & Heertum, R. V. (2005). Brain networks associated with cognitive reserve in healthy young and old adults. *Cerebral Cortex*, 15, 394-402.
- Storey, K. (2004). The case against the Special Olympics. *Journal Disability Policy Studies*, 15(1), 35-42.
- Storey, K. (2009). The more things change, the more they are the same: Continuing concerns with the Special Olympics. *Research & Practice for Persons with Severe Disabilities*, 33(3), 134-142.
- Suchy, Y. (2011). International activities of daily living among community-dwelling older adults: Discrepancies between self-report and performance are mediated by cognitive reserve. *J. Clin. Exp. Neuropsychol.*, 33, 92-100.
- Switzky, H. N. (2001). Personality and motivational self—System processes in persons with mental retardation: Old memories and new perspectives. In H. N. Switzky (Ed.), *Personality and motivational differences in persons with mental retardation* (pp. 57-143). Mahwah, NJ: Erlbaum.
- Tenenbaum, G., & Bar-Eli, M. (1992). Methodological issues in sport psychology research. *Australian Journal of Science and Medicine in Sport*, 24, 44-50.
- Tepper, G., Rosaio, A., & Pruyn, W. (2002). *Table tennis in schools programs*. North Melbourne, Victoria, Australia: Waterwheel Press.
- Thomas, G. (2012). *How to do your case study* (pp. 3-170). London: Sage.
- Thomas, J. R., & Nelson, J. K. (1990). *Research method in physical activity* (2nd ed.) Champaign, IL: Human Kinetics.
- Toriola, A. L., Toriola, O. M., & Igbokwe, N. U. (2004). Validity of specific motor skills in predicting table-tennis performance in novice players. *Perceptual and Motor Skills*, 98, 584-586.
- Turner, S., Sweeny, M., Kennedy, C., & Macpherson, L. (2008). The oral health of people with intellectual disability participating in the UK Special Olympics. *Journal of Intellectual Disability Research*, 52(1), 29-36.

- Tuval-Mashia, R., & Spector Marzel, G. (2010). Narrative research: Theory, creation and interpretation. Tel Aviv: Magnes.
- Van Biesen, B., Verellen, J., Meyer, C., Mactavish, J., Van de vliet, P., & Vanlandewijck, Y. (2010). The ability of elite table tennis players with intellectual disabilities to adapt their service\return. *Adapted Physical Activity Quarterly*, 27, 242-257.
- Van Biesen, B., Mactavish, J., & Vanlandewijck, Y. (2014). Comparing technical proficiency of elite table tennis players with intellectual disability: Simulation testing versus game play. *Perceptual & Motor Skills: Physical Development & Measurment*, 118(2), 608-621.
- Van Peer, W., Hakemulder, F., & Zyngier, S. (2012). Scientific methods for the humanities (pp. 4-76). Philadelphia: John Benjamin Publishing Company.
- Vardi, A. (2006). Contribution of self-esteem, self-differentiation, perception of stress in the family, and parents' differential treatment, to the peer growth of siblings of children with/without mental disability. M.A. thesis. Bar-Ilan University: Department of Social Work (Hebrew).
- Vidal, A., Martinez A., Pereira, M., & Martinez-Patino, M. (2011). Effect of a combined program of physical activity and intellectual activity in the cognitive functioning of the elderly. *Journal of Human Sport & Exercise*, 6(2), 462-471.
- Vickers, J. N. (2003). Decision training: An innovative approach to trainer ing. *Canadian Journal for Woman in Trainer*, 3, 1-9.
- Weiner, B., & Kukla, A. (1970). An attributional analysis of achievement motivation. *J. Pers. Soc. Psychol.*, 15, 1-20.
- Weiss, M. R., & Bredemeier, B. J. (1983). Developmental sport psychology: A theoretical perspective for studying children in sport. *J. Sports Psychol.*, 5, 216-30.
- Weiss, M. R., & Chaumeton, N. (1992). Motivation orientation in sport. In T. S. Horn (Ed.). *Advances in sport psychology* (pp. 61-99). Champaign, IL: Human Kinetics.
- Weiss, J. A., & Diamond, T. (2005). Stress in parents of adult with intellectual disabilities attending Special Olympics competitions. *Journal of Applied Research in Intellectual Disabilities*, 18, 263-270.
- Weiss, J. A. (2008). Role of Special Olympics for mothers of adults athletes with intellectual disability. *American Journal on Mental Retardation*, 113(4), 241-253.
- Weiss, J. A., & Diamond, T. (2005). Stress in parents of adult with intellectual disabilities attending Special Olympics competitions. *Journal of Applied Research in Intellectual Disabilities*, 18, 263-270.
- Wengraf, T. (2001). Qualitative research interviewing. Biographic narrative and semi-structured methods (pp. 51-60). Trowbridge, Wilshire, Great Britain: Cromwell Press Ltd.
- Westendrop, W., Houwen, S., Hartman, E., & Visscher, C. (2011). Are gross motor skills and sports participation related in children with intellectual disabilities? *Research in Developmental Disabilities*, 32, 1147-1153.

- Williams, A. M., & Davids, K. (1998). Visual search strategy, selective attention and expertise in soccer. *Research Quarterly for Exercise and Sport*, 69, 111-129.
- Wilson, R. S., & Bennett, D. A. (2003). Cognitive activity and risk of Alzheimer's Disease. *Current Directions in Psychological Science*, 12, 3.
- Yando, P., Seitz, V., & Zigler, E. (1978). Imitation: A developmental perspective. New York: Wiley.
- Zeichner, K. M., & Noffke, S. (2001). Practitioner research. In V. Richardson (Ed.), *Handbook of research on teaching (4th ed.)* (pp. 298-330). Washington D.C.: American Educational Research Association.
- Zellermaier, M., & Tabak, E. (2004). We'll do it our "or how action research builds professional learning community within a field colleagues college. Tel Aviv: Mofet.
- Zhang, P., Ward, P., Li, W., Sutherland, J., & Goodway, J. (2012). Effects of play practice on teaching table tennis skills. *Journal of Teaching in Physical Education*, 71-85.
- Zigler, E. (2001). Looking back 40 years and still seeing the person with mental retardation as a whole person. In H. N. Switzky (Ed.), *Personality and motivational differences in persons with mental retardation* (pp. 3-55). Mahwah, NJ: Erlbaum.
- Zigman, W. B., Schupf, N., Devenny, D. A., Mizejeski, C., Ryan, R., & Urv, T. K. (2004). Incidence and prevalence of dementia in elderly adults with mental retardation without Down syndrome. *AJMR*, 109(2), 126-141.

Online References

- Hutzler, Y. (2012). Sports (Adapted Physical Activity and Sport in Rehabilitation). In *International Encyclopedia of Rehabilitation*. Retrieved 18\11\13 from <http://cirrie.buffalo.edu/encyclopedia/en/article/12/>
- Physical Education Curriculum. In *Preschool Education* (Hebrew). Retrieved 18\11\13 from <http://cms.education.gov.il/EducationCMS/Units/PreSchool/KishureyHaim/ChinuchGufani/TocnitLimudimHinucGufani.htm>
- Special Olympics. In *Wikipedia* (Hebrew). Retrieved 20\10\14 from http://he.wikipedia.org/wiki/%D7%A1%D7%A4%D7%99%D7%99%D7%A9%D7%9C_%D7%90%D7%95%D7%9C%D7%99%D7%9E%D7%A4%D7%99%D7%A7%D7%A1
- Table Tennis. In *Maamarim* (Hebrew). Retrieved 20\10\14 from <http://www.articles.co.il/article/89113/%D7%9E%D7%94%D7%95%20%D7%98%D7%A0%D7%99%D7%A1%20%D7%A9%D7%95%D7%9C%D7%97%D7%9F?>
- Table Tennis. In *Wikipedia* (Hebrew). Retrieved 20\10\14 from http://he.wikipedia.org/wiki/%D7%98%D7%A0%D7%99%D7%A1_%D7%A9%D7%95%D7%9C%D7%97%D7%9F
- AAMR, American Association on Intellectual and Developmental Disabilities (1992).

In *Wikipedia*. Retrieved 2\11\14 from

http://en.wikipedia.org/wiki/American_Association_on_Intellectual_and_Developmental_Disabilities

Special Education Laws, Amendment 7. In *Kol Zchut* (Hebrew). Retrieved 2\11\14 from

http://www.kolzchut.org.il/he/%D7%AA%D7%99%D7%A7%D7%95%D7%9F_%D7%9E%D7%A1'7_%D7%9C%D7%97%D7%95%D7%A7_%D7%97%D7%99%D7%A0%D7%95%D7%9A_%D7%9E%D7%99%D7%95%D7%97%D7%93_%22%D7%97%D7%95%D7%A7_%D7%94%D7%A9%D7%99%D7%9C%D7%95%D7%91%22

Ministry of Education (2005). Motivation and estimates: Literature review and recommendations on the use of tools to assess motivation to assist in identifying gifted children in the school system. In *Ministry of Education, Israel* (Hebrew). <http://retro.education.gov.il/michrazim/documents/2149.pdf>