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## Effects of Nature-Oriented Preschools on the Socio-Emotional Development of Israeli Children

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### Abstract

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Based on on different development theories that combine nature and human psychology, nature-oriented methods of education have started to emerge. The subject of nature-oriented preschools addressed in this study comprises two aspects: (1) the psychological developmental theories that create the theoretical background for the insertion of human-nature interactions and their effects on the preschool children, especially on their socio-emotional development, and (2) a literature review of the theories dealing with the impact of nature on people, including the effects of both flora and fauna. The study presented here is part of a larger research plan investigating the effects of nature-oriented preschool system on several socio-emotional aspects of Israeli children. Using qualitative research methods, we aim to examine the behaviors of 20 children, aged 5-6, from an urban nature-oriented preschool in Israel and 20 children (5-6 years) from a regular urban school from the same area. The research aims to employ interviews, observations and questionnaires in order to investigate the nature-oriented preschools' influence on the socio-emotional functioning of nature-oriented preschool children compared to children from regular preschools.

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**Key words:** Nature-oriented preschool, human-nature connectedness, socio-emotional development.

### 1. Introduction

Nature-oriented preschools include a direct approach to nature, whether through living creatures, cultivating plants and other activities that directly link people with nature. A large body of literature



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exists on the contribution of green spaces and animals to people's physical, mental and emotional wellbeing, and many institutions today are using animals-assisted activities in therapeutic settings and in educational ones (Serpell, Coppinger & Fine, 2000). The effect of the interactions between animals and humans stands out in research examining the link between people and dogs and it indicates that pets' ownership boosts health and quality of life in a number of different ways (Toohey et al., 2013). The effects of the human wellbeing of the connection with nature through positive and creative interactions, particularly with animals, will be addressed in this paper, with special attention of the ways of integrating the human-nature interactions into the educational framework of preschool children, i.e. nature-oriented preschool education.

The subject of nature-oriented preschools addressed in this study comprises two aspects: (1) the psychological developmental theories that create the theoretical background for the insertion of human-nature interactions and their effects on the preschool children, especially on their socio-emotional development, and (2) a literature review of the theories dealing with the impact of nature on people, including the effects of both flora and fauna. The study presented here is part of a larger research plan investigating the effects of nature-oriented preschool system on several socio-emotional aspects, including different types of intelligence, on Israeli children.

## **2. Child Developmental Psychology Theories**

While intelligence is well known to be addressed by the Piaget's theory (Piaget, 1970; Miller, 2010), which connects the individual's world of thoughts to his/her experience in ways that implies using signs and symbols, Gardner & Hatch (1989) stipulated that human brain is divided into different plains in a way that processes dealing with different issues, such as number, language, pictures etc., are carried out using different pathways, that can be seen as different types of intelligence. According to Gardner and Hatch (1989), intellectual use of tools at school combines two main usages of elements, such as lingual symbols and logic symbols (mathematics). It is true that these two uses are key to determining people's learning abilities, but additional intellectual aspects, especially in interactions and functioning outside the school, are activated and nourished by symbols that are almost entirely unused at school (Gardner & Hatch, 1989). This phenomenon, which ignores diverse skills and human abilities, created the basis for the *theory of multiple intelligences* that expands the meaning of human intelligence and the understanding of child development in relations to the challenges of the environment (Gardner & Hatch, 1989), by taking into account diverse aspects that all constitute a part of the same general intelligence. The seven types of multiple intelligences are: the logical-accounting intelligence, lingual intelligence, musical intelligence, spatial intelligence, physical-movement intelligence, interpersonal intelligence and intrapersonal intelligence (Gardner & Hatch, 1989), where the first two types are generally valued in schools, the next three types are generally associated with arts and the last two types are also known as Gardner's personal intelligences.

Referring directly to Gardner's theory, Vygotsky (1980, apud Miller, 2010) dealt with the process that people carry out when confronted with a stimulus. Hence, Vygotsky (1980) considered that people's reactions are not automatic, but the information processing that takes place from the moment

of stimulus perception and the reaction involves a mediation of the environment by the stimulus. Hence, people's reactions are modeled according to a stimulus that is perceived in their consciousness. This process not only takes place when a stimulus is recognized, but also later, at the stage when one has to deal with it and self-regulate people's reactions. Language, according to Vygotsky (1980), is a mediating tool that affects individuals' perceptions of their world and therefore, different stimuli get different meanings as individuals mature and pass from toddler to childhood stages (Miller, 2010).

Through socially mediated attention, passed on by significant adults in children's lives, children focus their attention on stimuli that are significant in their lives, and as such, in fact, their development is determined as dependent on stimuli to which they are exposed. Exposure to stimuli relevant to lingual and logical intelligences alone will focus children's development on stimuli relevant to these types of intelligences. Thus, by combining Gardner's and Vygotsky's theories, as long as the education system focuses on stimuli relevant only to specific types of intelligences, children, and adults, will act according to these types of intelligence alone (Miller, 2010). This phenomenon not only limits children's abilities to express themselves and focuses them on defined areas of expression, but it is also likely to prevent congenital skills and intelligences from being expressed and in fact prevent many children from fulfilling their abilities and tendencies (Gardner & Hatch, 1989).

### **3. Human-nature interactions: Effects on human education**

It is generally acknowledged that nature's impact on humans is likely to be measured by human's closeness to fauna and flora. As argued in the introduction, the connection between humans and nature, especially animals, is likely to bring benefits in a number of different ways. One of the most important theories behind the natural tendency of humans to connect with nature, especially with living beings such as animals, is the *biophilia hypothesis* (Wilson, 1984), which sees the natural tendency of humans to positively interact with other forms of life as an evolutionary product of co-existence between humans and other beings. A special attention has started to be given to the relation between children and nature by several authors, such as Kahn & Kellert (2002), in their work *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*, pointing on the developmental benefits of the interactions with companion animals (i.e. with whom children can develop a nurturing relationship).

In everything related to wellbeing, it appears that benefits associated with keeping pets can be generally divided into four main areas, with interdisciplinary overlapping: therapeutic, psychological, physiological and psycho-social (Wood, Giles-Corti & Bulsava, 2005). Of everything related to the mental contribution the presence of animals has on people's lives, the following are often pointed out: providing unconditional love, developing feelings of responsibility and empathy and increasing self-image and self-esteem (Doron, 2000). Pet ownership supports and promotes health in several aspects (Doron, 2000) and this is done, amongst others, through going for walks and runs with dogs, where these activities are seen as beneficial both socially and physiologically. Also, these two influences are considered to prevent health problems later in life. Also, compared to elderly persons without companion animals (dogs), elderly dog owners show a higher level of physical activity and social

involvement, especially meaningful social interactions, a higher quality and a greater concern for their residential environment and neighborhood (Toohey et al., 2013).

Another influence of nature on humans is through green spaces and gardens. According to Kellert (2005), being far from nature or lacking of sufficient exposure to it, is likely to lead to problems and developmental delays in children, both mentally and physically. As a consequence of the freedom individuals in society have to choose regarding where they live, without any dependence on food production, most people have moved away to cities and have become distanced from exposure to nature and various natural systems. According to Kellert (2005), this distance, both physical and cognitive, might affect the children's spiritual mental and physical development, in terms that distance from nature might prevent them from an expanded development, which, as an implication of Gardner & Hatch's (1989) theory, implies the development of intelligences more than only lingual and logical forms. Apparently, compared to individuals living in urban areas (distanced from nature), the children (and adults) who are frequently exposed to nature are able to better adapt their abilities to a number of areas, including physical skills, physical discomfort, intellectual development, emotional maturity, creative skills, moral judgment and spiritual meaning (Kellert, 2005).

Nature-oriented preschools, which are developed to operate mainly for the benefit of children living in urban areas, are meant to provide them with exposure to nature that has been lost in urban sprawls and modern life, and to allow them to develop all the aforementioned skills in order to turn them into more complete, better and much capable persons. Kellert (2005) emphasized in his research the term *restorative environmental design*, which would enable the experience of and connection to nature as part of urban spaces.

## **4. Methodology**

### *4.1 Research Design*

This research aims to investigate several socio-emotional and intellectual variables that might define the effects of nature-oriented preschools in Israeli children compared to children attending regular preschools, for a duration of one school year from the moment of enrolment. We propose that this investigation should employ mixed methods, qualitative and quantitative, which will be carried out using three separate means: observations, interviews and questionnaires. Being able to use both qualitative and quantitative approaches allows as comprehensive examination as possible of the studied phenomenon and a consistent examination of results, based on the quantitative approach (Beckerman, 2006), as well as identifying inconsistent phenomena that require the more in-depth understanding of qualitative research (Shkedi, 2007).

### *4.2 Research Population*

The research population will include two distinct categories of participants (adult professionals and preschool children), with both categories divided into two groups (experimental group and control group). Professional participants in the experimental group will be from nature-oriented preschools in Israel, while the control group will come from a regular preschools in Israel. The preschoolers group will be a convenience sample consisting of 40 children aged 5-6, of whom half are attending a nature-

oriented preschool and the other half are attending a regular kindergarten. The nature-oriented participants in the expert sample will consist of four preschool teachers, four petting zoo experts, two nature and flora teachers, two psychologists and two speech therapists; the control group of professionals (i.e. professionals from the regular preschool) will consist of three kindergarten teachers and one psychologist.

#### *4.3 Research Tools*

The research tools to be used in this proposed investigation are divided in two categories: observation tools and report-based tools.

#### *4.4 Observation Tools*

The observations will focus on the social, emotional and intellectual conduct of children with their peers and animals at kindergarten, nature-oriented preschool and free environment (such as the gym lessons outside the school), for specific amount of time, e.g. 6-10 sessions of observations of one hour each. In order to minimize as much as possible the researcher's impact on this study's results, no actual real time notes will be written while they are going on, but events will be recorded using a small digital camera from a concealed point at least five meters away from the scene of activities. The analysis and the coding of the video recorded data will be performed afterwards, using focal individual sampling method.

Observations will be analyzed in a number of ways. The first way will be descriptive and it aims to provide an understanding of the subtext in which interactions take place. The second aspect will be looking for consistent behavior in the children in an attempt to find recurring characteristics in children's behavior, both emotionally and behaviorally, while emphasizing the following areas: awareness, knowledge, attitudes, abilities and participation (Ravensbergen, 2012). Further observations of a random sample of 5 children will be based on the Test Observation Form (TOF) (McConaughy & Achenbach, 2004). The TOF is a standard tool for observing children aged 2-18, which is using 125 characteristics graded according to a four point Likert scale.

#### *4.5 Interviews*

The goal in carrying out interviews is not necessary to acquire answers to questions structured in advance or to examine research hypotheses, but rather to provide accessibility to participants' perceptions and thoughts and as such to enable understanding of their perceptions of the effects of nature preschools on children's behavioral and emotional development. Most of the questions posed in interviews are open questions allowing participants to reveal their opinions, perceptions and attitudes, and the interviewer does not intervene or guide participants. In this way, the field of study is expanded in a way that is not predetermined (Shkedi, 2007).

Interviews with the children will be carried out according to the Semi Structured Clinical Interviews for Children and Adolescents (SCICA), which is a reliable and valid tool for measuring children's activities and school performance, peer relations, family relations, self perceptions, feelings, and parent/teacher-reported problems (Achenbach, 2011). Several adjustments of the questions will be made in order to assess the connection of the children with nature (at school and outside the school). A

question referring to the existence of family activities and their composition will be added to the family questions section. Tests 7 and 8 of SCICA (i.e. those examining motor skills) will not be carried out as they are outside the aims of this study.

#### 4.6 Report-based tools

In order to examine children's behavioral and socio-emotional development in relation to the educational environment provided by the preschool, the following dimensions will be assessed by using standardized instruments (before and after the implementation of the nature-oriented program), which will be or are already translated into Hebrew:

1. *Behavioral and Emotional Rating Scale - second edition* (BERS-2; Buckley & Epstein, 2004). BERS was developed to allow tracking children's positive behaviors. The scale combines both children's self-reporting and reports from professionals involved in their education. The questionnaire is designed for children aged between 5-18 years and it includes 52 items. Although the initial version of the questionnaire did not differentiate between the self-report and the report of the professionals and/or parents, the BERS-2 version allows for this distinction to be made. All the 52 items of the questionnaire have to be answered on a 4-points Likert scale and it takes around 10 minutes to fill it in. In our study, BERS-2 questionnaires will be individually distributed to the participants. BERS-2 contains five subscales that summarize the following areas: strength of interpersonal relations, family involvement, strength of intrapersonal relations, educational institution's functioning and emotional strength. The questionnaire includes 8 open questions in which participants can indicate a child's strengths and weaknesses in various areas such as social, learning and more. Reliability of the sub-measurements shows strong internal consistency with a mean value ranging between 0.84 and 0.92 on the teachers' questionnaire and between 0.84 and 0.93 on the parents' one (Buckley & Epstein, 2004).
2. *The Empathy Index for Children and Adolescents* (IECA) is a 22-item self-report questionnaire developed and validated by Bryant (1982) to assess dispositional affective empathy in children 6 years and older. The IECA has been designed to assess emotional responsiveness, rather than accuracy of cognitive insight. The scale contains items that tap a range of affective reactions, including empathy, sympathy and personal distress.
3. In order to examine multiple intelligences, the *Multiple Intelligence Development Assessment Scales* (MIDAS; Shearer, 1996) translated into Hebrew, will be used. The questionnaire contains 96 questions divided into 8 main sections and it takes about 20 minutes to complete it. The preschool children's version is completed by parents, who will be asked to do so, by using an informal consent form. The questionnaire's reliability is Alpha Cronbach  $\alpha = .85$  range .76 to .87 (Shearer, 1996; Shearer, 1998).
4. *Parents' perception towards the preschool education system*, i.e. regular school and nature-oriented preschool (before and after one school year from the moment of enrolment). The questions will refer to all the dimensions listed above, as well as to the

social competences of their children and to their civic-related behaviors, including respect and care for the environment.

#### *4.7 Research Hypotheses*

H1 - Children's behavior will be different in the surroundings of the built preschool (indoor) and in nature outside (outdoor), both in the conditions of free observations and those structured by the Test Observation Form (TOF tool).

H2 - Children attending the nature-oriented preschools are expected to have higher scores at SCICA than those attending regular preschools. Assessments will be done before and after one academic year from the moment of enrolment.

H3 - Experts will report better behavioral and emotional results among children from the nature-oriented preschools as compared to children from regular preschools, both peer-to-peer and children-to-staff. Assessments will be done before and after one academic year from the moment of enrolment.

H4 - Children attending the nature-oriented preschools are expected to have higher scores on several aspects of the multiple intelligence scale compared to children attending the regular schools (after one year from the moment of enrolment).

H5 – Parents will perceive the nature-oriented school system as having higher impact on the socio-emotional competences (intra- and interpersonal) of their children than the regular school system.

#### *4.8 Data Analysis*

Data analysis will be carried out for each type research tool, as it follows: (1) Observations - observations will be preliminarily analyzed to identify common themes for each activity area (nature, preschool, other) aimed at finding themes that can be compared between the regular and nature-oriented preschools. In addition, individual observations will be analyzed in order to identify the differences in behavioral and emotional problems shown by children in the two school environments according to the TOF tool; (2) SCICA interviews will be quantified with the aim of identifying the emotion and behavioral maturity of the children and compare the results with the standard means at population level; (3) Results of the report-based instruments will be analysed with t-test for independent samples in order to compare the two types of preschool systems and with t test for dependent samples to compare the assessed aspects before and after one year of school (from the moment of enrolment).

### **5. Conclusions**

We consider that this proposed comparative analysis between the effects of school environment on the socio-emotional and intellectual (i.e. multiple intelligence) development of children enrolled in regular preschools and nature-oriented preschools in Israel might contribute to a deeper understanding of the need for such nature-oriented curricula for early ages. We expect that the perception of parents regarding the impact of school system on the social and emotional competences of their children will be in the favor of nature-oriented preschools. More important, this type of nature-oriented education might be of particular need in Israel, which is a country well known for running educational and

therapeutic programs for crisis management, resilience development and emotional regulation for fragile categories of individuals. Nature-oriented preschools could be relatively low-cost solutions for preparing the Israeli children to optimally cope with different types of stressors later in their life, as well as a welcome environment for education, based on healthy and positive interactions.

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