MONTESSORI RESEARCH EUROPE (MO.R.E.)

(c/o Prof. Dr. Harald Ludwig, Montessori Centre of the University of Muenster, Germany,
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MONTESSORI RESEARCH & MORE NEWSLETTER 1-2009 (JUNE)

Dear members and friends of MORE,
We at the Centre for Montessori studies of Università degli Studi Roma Tre (Italy) have pleasure in sending you the first 2009 issue of our NEWSLETTER Montessori research & MORE.

A special thank to those who offered their reflections and others who reported on their research: this enables us all to enrich our study horizons.

NEWSLETTER 1-2009 features:

3. Some additional news

3.1 *New Italian Edition of Maria Montessori's "From Childhood to Adolescence"*

3.2 *Rome Seminar "From Childhood to Adolescence with the Pedagogy of Maria Montessori"*

We would like to remind readers that, as MORE does not yet have its own website, back issues of the newsletter are available at <http://www.unimuenster.de/Montessorizentrum> or <http://egora.uni-muenster.de/ew/mz>.

As announced in issue 2-2008, we plan our ***2009 informal meeting*** *in connection with the X MONTESSORI EUROPE CONGRESS, which is organized by MONTESSORI EUROPE from* ***16th to 18th October 2009*** *in Cracow, Poland (for more information visit the website of Montessori Europe: <http:*//www.montessorieurope.com>). *If you plan to participate in the meeting, please inform Prof. Dr. Harald Ludwig, University of Muenster, Germany:* ludwigh@uni-muenster.de *or* haraldludwig@hotmail.com. *If there are enough interested members of our network, we will try to organize the informal meeting in Cracow.*

Finally, we inform you that the Montessori team of the University of Stockholm will be bringing you NEWSLETTER 2-2009.

We hope that you will enjoy this newsletter.
With kindest regards

Clara Tornar

1. Theoretical Contributions

1.1 Maria Montessori Contribution to Scientific Pedagogy

Lecture given at the doctoral course in "Innovation and evaluation of the educational systems" of the International Doctoral School "Culture, Éducation, Communication" – Department of Educational Design, University of Roma Tre

by Clara Tornar (University of Roma Tre, Centre for Montessori Studies, Italy)

Maria Montessori's position on scientific pedagogy and her method involves two problem areas: firstly, the necessity to clarify and define the relationship between scientific pedagogy and other sciences, particularly anthropology and physiological and experimental psychology, and, secondly, the necessity to delineate a research method and objectives. She explicitly recognised the importance of these new fields of experimental science, defining them not coincidently as corner stones of new pedagogy referring above all to their contribution to the development of observation procedures for the discovery of children's psychological and morphological characteristics.

Within positivism, experimental psychology and anthropology constituted fundamental reference for scientifically based pedagogy in its efforts to distinguish itself from a merely philosophical or speculative approach. With the work of Wundt, Weber, Fechner and Binet (cited in *The Montessori Method*), experimental psychology had developed a series of reactive mental tests to measure the responses of normal subjects to stimuli of varying intensity. A. Binet's metric scale of intelligence, perfected in 1905, had become widely used in schools to determine mental levels considered to be "normal" at various ages. The application of anthropology to the study of schoolchildren constituted a resource in keeping track of their development. For example, types of physical build, indicative of the relationship between specific measurements and age, offered a guide to the diagnosis of the individual constitution to which was thought character and "morbid" predisposition, both organic and mental, were related. Precisely on account of the support that these disciplines could offer, "the methodical study of learners" in the form of observation during various growth phases and the measurement of their anthropological development were agreed to be the principal conditions for renewal in education.

Montessori thought it important that pedagogy should avail of various disciplines and competences and she underlined the necessity for "fusion" of contributions from various fields in the interests of innovation in education and pedagogy. As she observed in *The Method*, «Education, it is true, does not exist in measuring one's head, height, and so forth; but such means point the way to it, for we cannot educate anyone until we have firsthand knowledge of him"»[1]. It should be noted that in tackling the education of the mentally disabled she had adopted procedures to awaken the individual capacity to react to stimuli generated by

[1] M. Montessori, *The Montessori method; scientific education as applied to child education in the Children's Houses*, New York, Stokes, 1912, p. 4.

the environment, and to that end she was inspired by 'minimal perceptive' data derived from experimental psycho-physiological research.

However, Montessori claimed that pedagogical science should be autonomous in both content and method on the grounds that what prevailed in other areas of investigation should also herein apply. Above all she affirmed the necessity to define method, emphasising that «Every branch of experimental science has developed from the use of its own peculiar method»[2]. She pointed out that it was thanks to their scientific method that the experimental sciences had succeeded in defining their specific subject matter, citing as representative examples the science of bacteriology, which «has risen from the isolation and culture of microbes», anthropological disciplines (criminal, medical and pedagogical anthropology), which «have had their origin in the application of anthropometric methods to individuals of various classes, such as criminals, the insane, the sick in clinics, and students», experimental psychology, which «needs as its starting point an exact description of the technique of performing an experiment». She explained that «In general, it is important to define the method and technique of experimentation and then, after making specific use of them, to wait for the results of the experiment»[3].

Montessori complained that right up to contemporary times pedagogy had simply been borrowing other sciences' research methods, only becoming aware of the problem of method at a very late date. She reported that successful progress had effectively been achieved through the singling out of "the child to be educated" as the subject of scientific pedagogy, an achievement which was the result of an earlier period of observation. She noted, "Just as in anthropology and psychology, which are by nature experimental disciplines, likewise in pedagogy it is necessary to observe and study: then will come education, which will gather the results and sustain endeavour and expectations." But, immediately adding that to do this the first rule must be "observation and respect for the soul of the individual child."[4]

The latter clarification is particularly important. Montessori was convinced that scientific pedagogical method must above all stem from observation. She emphasised that observation must be carried out in conditions which categorically "exclude prejudice", and that "when we gather data we need no other ability than knowing how to gather them precisely and objectively."[5] However, such a criteria is not on its own sufficient to assure correct observation unless conditions are created to allow observation phenomena to reveal themselves and unfold authentically. Montessori held that this could be brought about by creating the conditions whereby the subjects of observation, i.e. children, could freely initiate "spontaneous individual manifestations".

In contemporary terminology, we might say that Montessori saw the rigorous procedure in gathering observation data, i.e. "accuracy and objectivity", as the necessary condition to assure their *reliability* in effectively corresponding to the observed situation, while the creation of a stimulus situation for the revelation of "spontaneous individual manifestations" corresponded to the condition necessary to guarantee data *validity*.

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[2] Ivi, p. 21.
[3] Ivi, p 21.
[4] M. Montessori, *Corso di pedagogia scientifica*, Società Tipografica Editrice, Città di Castello 1909, pp. 17-18. Our translation.
[5] M. Montessori, *Antropologia pedagogica*, Vallardi, Milano 1910, p. 19. Our translation.

In order to provide *valid* data, observation of children had to take place in a familiar environment which would permit "freedom for pupils". Montessori held that respect for this criterion constituted "a cornerstone of scientific pedagogy." In fact she stated that «if a system of education is to rise from a study of the individual student, it will have to come about in this way, that is, from the observation of free children who are watched and studied but not repressed» [6].

This was also to be the cornerstone of *her* pedagogy. Upon it she conducted the experiment of Via dei Marsi, the salient phases of which featured: a) the creation of an environment fostering the free expression of children's needs, tendencies and abilities; b) subsequent observation of their responses; c) progressive restructuring of the environment in relation to what had been perceived. This thoroughly inductive procedure characterised her pedagogy as incessant cyclical *action-theory,* in which action and subsequent observation of its effects offered material for theoretical reflection. For this reason, it assumed the specific connotation of continuous reflection on action.

Montessori sow Casa dei Bambini as a «psychology laboratory», albeit with the important difference that experiments «must abstain from provoking reactions planned by the experimenter; but rather stimulate individuals to exercise their choices freely, and thereby enable them to express their psychological needs spontaneously»; furthermore, the stimuli which were introduced, «although similar to those used in experimental psychology, are designed to facilitate individuals in the establishment of long-lasting reactions capable of modifying their personalities»[7] . This clarification reveals what Montessori meant by scientific pedagogy: a discipline capable of introducing into real school experience elements which will profoundly affect and renew it.

Montessori expressed this conviction more explicitly in the last edition of *The Method*, in which she referred to scientific pedagogy as a "transformational science", emphasising that «the object of a science of education should be not only to "observe" but also to " transform" children» and that «a scientific education based upon objective research should also be able to transform normal children» [8].

Thus her thinking fits perfectly into the pedagogical direction which positivism imprinted on the human sciences. Strong points in this outlook feature trust in the efficacy of the experimental method, which led to the proposal of workshops in pedagogical anthropology and teacher training courses, and the institution of anthropological and psychological examination of schoolchildren along the lines of Stanley Hall's investigations in Boston, USA, dating from 1879, and of German research in Jena and Berlin dating from 1869. Inspired by Sergi, her predecessor and father of anthropology, it is clear that Maria Montessori visualised school, not only as the place to apply new methodology, but, above all, as a laboratory of scientific research. This constituted the basis for her educational experiment of a school to fit the child.

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[6] M. Montessori, *The Montessori method*, cit., p. 21.

[7] M. Montessori, Introduction to the third Italian edition of *Il Metodo della Pedagogia Scientifica applicatoall'educazione infantile nelle Case dei Bambini*, Maglione e Strini, Roma [s.d.] (ma del 1926) (I ed. italiana, Città di Castello 1909). Our translation.

[8] M. Montessori, *The discovery of the child*., Montessori-Pierson Publishing company, Amsterdam, 2007, p. 34.

1.2 Montessori method against the background of contemporary educational challenges

by Beata Bednarczuk (University of Maria Curie-Sklodowska in Lublin, Poland)

The world around us constitutes a complex whole. All of its elements are mutually connected and for this reason it is deemed that integrated education is justified by the necessity of understanding complex problems of the contemporary world. The change of the educational system is also implied by the constructivist point of view on the essence of cognitive processes and especially by the views on constructing individual representations of reality. Additionally, mechanisms of the functioning of a human brain are analysed in order to, after recognizing them, create proper learning conditions for pupils. Does integration constitute a condition for saving the education process and if yes what ideas should it be based on? How to execute them? The directions are provided by the analysis of certain assumptions of Montessori method.

Holistic education

«The current state of knowledge about the world and the development level of the technological civilization greatly surpasses a curriculum of any school or university. As a result of this we are in a situation in which» education does not explain the world well enough to give a man the feeling of the sense and safety and school cannot report the actual knowledge state anyhow. If we want to hold fast to the positivist tradition of education it has to mean a defeat"[1]. «*No dangers, phenomena or disasters can be treated as regional problems any longer*». All academic experts agree that if there is no radical and common change of human consciousness (in the sphere of attitudes and activities) in the nearest future, our world will become ecologically damaged, which will lead to global threats to life. The more global the problems are, the less an individual can do"[2]. *«What is necessary then is* ***a turn into the direction of an overall look*** *on the world and humanity for* Globalisation, as we may say, is a process of re-stratification of the world, that is its repeated stratification based on rules different than before and a process of constructing a new self-regenerating hierarchy with a world wide range»[3].

Pedagogues' demand to return to holistic education, as justified by Śliwerski (1998), is connected with the necessity of saving the educational process, which becomes essential for the preservation of a human being.

Cognitive psychology

The change of functions and aims of school results also from an „interpretation turn" which takes place due to cognitive psychology. Klus-Stańska points at the dependence of

[1] M.Grondas, *Holistic Expressions in Education*, [in:] *New School Programme, Inter-subject Integration*, Warszawa 1999, CODN, p.43.
[2] B. Śliwerski, *Debate about Education in Germany as one of the Sources of Inspiration for Pedagogical Reforms*, [in:] D. Klus-Stańska, M. Suświłło (editor.), Olsztyn 1998,. WSP Press, p. 67.
[3] Z. Bauman after J. Nikitorowicz, *Creation of a Child's Identity. Challenges of Intercultural Education*, Gdańsk 2005, GWP, p. 24.

cognition results on «*individual's previous experiences, his intentions and culture which provides 'tools' for cognition and thinking rules*»[4], and not exclusively on the level of a man's psychophysical maturity or the learning process. The mentioned author submits a thesis that it is difficult to talk about a direct reflection of reality in a human mind, an accurate registration of incoming data. Every cognitive activity leads to a particular conversion of inflowing information.

A "creative" character of information conversion processes is connected with the discovery of an integrated character of cognitive structures creating systematic wholes, that is schemas[5] which are reasonable from an individual's point of view. A schema is an *"organised knowledge structure"*[6], "*generalised representation of an individual's experience"*[7], "*general knowledge about an object, event, which is created on the basis of previous experiences"*[8]. Schemas recapitulate essential, common features of stimulating events in an abstract form they play an important role in the process of comprehension and information conversion as they influence the perception of new experiences, their interpretation and modification of already existing wholes[9]. To continue, we can state that a man does not adopt or acquire knowledge but he **creates knowledge** by himself. In connection with the above, school knowledge should be treated as a system of created meanings, negotiated notions, re-organized substances. That is why we should abandon in school a transfer of knowledge as the only way of education in favour of its creation by pupils[10].

The central nervous system and the education process

People use schemas creating an individual, compact model of the world, as ell as sharing this model with others in the process of communication.. The central nervous system which enables an individual's survival and development, is actively engaged in negotiating the world. *«A human brain is naturally directed onto finding connections»*[11]. A human mind collects information and turns them into an activity plan. This skill as well as other characteristics, for example a straight body and an opposite thumb, have been acquired by humans in the evolution process. The basic function of the organism has become observing, evaluating and finally reacting to what happens in the surrounding in order to maintain life, to secure the permanence of the species.[12] Attention and evaluation are the first to react to the presence or absence of danger. In a dangerous situation protective reactions are initiated. When safe, a man concentrates on what in his surrounding is personally important for him, he can develop. In other words, since **safety and meaning** are key elements for the process of life, they should constitute an essential element of the education process. A safe school, that is the one which reinforces the feeling of physical and psychical safety, accelerates the process of learning complex,

[4] D. Klus-Stańska, *Construction of Knowledge at School*, Olsztyn 2002, Warmińsko-Mazurski University Press p. 52.
[5] Ibidem, p. 53.
[6] G. Mietzel, *Psychology of Education*, Gdańsk 200 ,GWP, p. 220.
[7] D. Klus-Stańska, *Construction* ..., op.cit, p. 53.
[8] E. G. Cohen after G. Mietzel, *Process* ..., op. cit., p. 220.
[9] D. Klus-Stańska, *Construction* ..., op. cit., p. 53.
[10] Ibidem, p. 79.
[11] R. Sylwester after D. Walker, *Integrative Education. Empowering Students to Learn*, OSSC BULLETIN 1996, vol 40, nr 1, p. 6.
[12] Ibidem, ps. 6-7.

integrated wholes. Meaningful issues, however, which either naturally or due to a tutor's artistry obtained a context, are easily included in a pupil's model of the world, because this model by itself becomes personal and valuable.[13]

Maria Montessori's method and the challenges of the contemporary world

Montessori thought that the education system has to correspond to a child's possibilities and internal pursuits, that is «*the structure and essence of education should be determined by a child's needs and not by what the society thinks a child should know*»[14]. The researcher described a child's natural development plan, which can be updated and developed due to the surrounding in which a child lives. According to Montessori development is a process of forming a person, constructing a human being by his own activity. That is why the Italian called a child "creative" and used this term in a meaning convergent with the constructivists' views. «*A child assimilates his environment unconsciously – creates culturally objective traces, which later transfers into a subjective culture*»[15]. *"Step by step he creates his mind*"[16]. A child is a creator of himself, a father of humanity.

The discovery of a child "*who is a subject and becomes a subject*"[17] has influenced the popularity of the system not only in Italy and Europe. It has been also affected by doctor Montessori engagement in building peace in the world, her openness to global problems. In Montessori's opinion solving problems of the contemporary world is a question of a new shape of education. It is thanks to education that a change can me made in people and as a consequence in societies. The pedagogue and the doctor thought, similarly to the above mentioned pedagogues that «*We are all one organism, one single nation. [...] There are no [...] such events pertaining to one nation which would not pertain to others. We can find evidence for this in daily newspapers; mutual dependencies are increasing. That is why we have to develop true mutual understanding*»[18]. The author's son, Mario Montessori, added: «*Education must search for the basis of its essence besides temporary social structures and children should be taught about global events in the development of the civilisation*».[19] They will find a reference to current situations and events. That is why **human needs** are in Montessori method an issue organising learning both about the development of the civilisation and the reality of a contemporary man's life. According to the Italian pedagogue's intention such a structure of issues should make pupils realize that in every corner of the globe people feel the same needs and the way of satisfying them has been determined by historical, political and geographical conditions[20].

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[13] Ibidem, p. 7.
[14] J. Chattin-McNichols, *The Montessori Controversy*, Albany, New York 1992, Delnar Publishers, s. 37.
[15] Kratochwil L., *Montessori`s Educational Theory: Approaches and Concepts – Stimuli and Limitations*, "Eeducation" 1996, vol 53, p. 34.
[16] E.G. Hainstok, *The Essential Montessori*, New York and Scarborough, Ontario, 1987, A Mentor Book, New American Library, p. 62.
[17] J. Bałachowicz J., *Initial Integrated Education - Theoretical and Practical Problems*, [in:] D. Klus-Stańska, M.J. Szymański, M.S. Szymański (eds.), *Renesans*..., op. cit., p. 89.
[18]G. Meisterjahn-Knebel, *Perspectives of Montessori Pedagogy for Europe*, a translation of the lecture given at Montessori Europe International Conference in Saltzburg 2001, a copied script, p. 7.
[19] E. Eckert E., *Child as a Part of Cosmic Unity – His Rights and Energy for Peace*, translation of the lecture given on 17.11.2002, at Montessori Europe International Conference in Łodź, a copied script, p.20.
[20] T. Seldin, D. Reymond, *Geography and History for Young Children*, Utah 1981, Brigham Young University Press.

The realization of the idea of education for peace, the coexistence of nations, the relationship between culture and nature is possible due to *cosmic education*.[21] *Cosmic education* is the author's attempt of looking at the world and humanity, it describes cohesion of life. A man is a part of the universe, that is a consistent whole, particular elements of which exist in interdependencies. In the coherent, fully interpreted picture of the world, every creature, every being as an element of a huge community plays a particular role in it. It is a man's task to maintain the world in balance. Maria Montessori wrote about a man's cosmic vocation. Equipped with free will and thinking ability he can consciously and purposefully intervene in the laws of nature, that is in a cosmic plan. That is why, he is greatly responsible for the development and improvement of the world. Cosmic education is then something more than the subject of education, it is a **philosophy of life and education! A philosophy of a strict connection of a man with his environment, with other people, an idea of harmony, interdependence, coexistence, unity.**

Consequently, learning about processes and phenomena should be done in connection to the whole. «When a child gets to know trees, then a teacher should not forget to describe how soil conditions, animals and plants mutually influence the fact that a tree can grow and, as it grows, it can create such conditions for plants, animals and people which allow them to live well[22]. Starting from the whole aims at creating an image of order, 'cosmic arrangement' and not providing knowledge about numerous details and facts. A child's subjects and activities are then gathered around "subject wholes - realistic, practically connected subjects". In turn a child is supposed to analyse, to separate parts, to look for connections, to perform activities on concrete and imagined matters and notions (again returning to the whole but now in a new shape). During the learning process a child requires time for mastering interesting connections and for checking them, for a critical analysis [...]. The extension of this structure again requires using it in a new, important and subjectively valuable activity»[23]. Additionally, a child is given time for consideration, reflection, contact with literature, expression of his experiences, feelings connected with the situation of learning.

School as a place of a child's safe and subjective learning

A school in the terms of the Italian doctor becomes «*a prepared environment in which a child free from an excessive teacher's intervention can live his own life conforming to the laws of his development*»[24]. A teacher prepares the learning environment (a basic element of the education process) taking into account pupils' interests, possibilities and needs. The curriculum, organised and suggested tasks are adjusted to them.

The task of didactic and educational influences in Montessori system is to succour a child's development and to prepare him to live among people. The pointed tasks are realised by means of a directed activity. They are achieved by didactic materials defined also as developmental «*A didactic material [...] is understood as a set of external stimuli*

[21] The etymology of the word "the cosmos" is explained by The Foreign Word Dictionary; it derives from the Greek language (*kósmos)* and means order, the world, the world as a harmonically organised whole, the opposite of chaos.
[22] B. Stein, *Theory and Practice of Maria Montessori's Pedagogy in Primary School*, Kielce 2003, Jedność, p. 133-134.
[23] J. Bałachowicz, *Initial* ..., op. cit., ps. 91-92
[24] E. M. Standing, *Maria Montessori. Her Life and Work*. New York 1974, New American Library, p. 38.

provoking internal crystallisation and the development of a child's soul»[25]. Didactic materials are «*a kind of stairs, which enable climbing up, step by step, and the steps of these stairs are a necessary tool for entering culture and achieving higher levels of development*»[26]. Materials thus have three basic functions: they contain learning subjects which allow to achieve successive stages of development, they are means of introducing into culture and society in which a child lives and finally they enable the construction of individual educational programmes.

Flexible and individual educational programmes. Rich learning environment

Didactic materials constitute a logically ordered programme whole. They are a child's learning groundwork, central axis, basic line. We will not find a book - manual or a book - instruction for a teacher prompting „How to teach effectively". We will find, however, a set of didactic aids which enable undertaking purposeful, structured educational tasks. **Developmental aids - "a programme basis" are a starting point in the process of constructing syllabuses,** which is understood as organising various exercises, activities, schemes, the number and shape of which depend on a child and especially on a diagnosis of a child's development, on a teacher's reflection and his sensitivity. The possibility of composing didactic tasks and creating new materials is unlimited and open. At this point it should be added that all **materials** gathered in the classroom **constitute** only **one and more than that a nonexclusive** element of Montessori programme. **The centre of the programme are children's investigations and observations** which stimulate asking of questions and organizing new, more and more complex and accurate research plans and intensions. On the other hand, standard Montessori aids and materials prepared by teachers, pupils or even parents enable the creation of individual learning programmes, release from constant and direct teacher's help as well as from obligatory handbooks. They constitute a valuable aid in the process of systematising and fixing the material in the memory.

At this point it should be mentioned that didactic materials are designed for self-education, which means that the educational process according to Montessori method is performed mainly by means of individual learning. That is why didactic materials are prepared in such a way as to show the way of work, to lead to a proper answer, to enable to gain the data about learning and its effects. By means of that a pupil, independently or with the teacher's or friends' help, tries, analyses, contrives, reaches knowledge. He makes discoveries in accordance with his possibilities. Due to this a child's work, and not a proper answer, is the most important in the educational process.

The construction of individual, subjective educational programmes succours and stimulates observance of generally accepted rules organising a child's learning. The rules are as follows:

- **the rule of activation**, the essence of which is the creation of working atmosphere favourable to choosing freely both a developmental material (and at the same time a didactic one) as well as the place of work, the way of work and partners for work,[27]

[25] F. Pinesowa, *Educational System of Dr. Maria Motessori*, Warszawa 1931, Dom Książki Polskiej, p. 11.
[26] M. Montessori, *The Advanced Montessori Method*, vol. 1, Oxford, England 1991, Clio Press Ltd, p. 65.
[27] Freedom release a child's activity. The limit of freedom is common weal, another working child cannot be disturbed. Freedom from a biological perspective means agreement to spontaneous expression of a

- **the rule of support and limited teacher's interference**, that is supporting a child's activity in a direct way (tutoring, preparation of flexible and individual programmes, help in self-assessment of work results, etc), intervention only when a child needs help in order to reach a goal, which he cannot reach by himself or when he asks for help (*Help me do it by myself*),
- **the rule of individualisation of pace and subject of learning**; a pupil independently chooses a subject of work, adjusts the time of working, which creates the need of the individualisation of the educational support and diversification of activity programmes,
- **the rule of respect for child's work**, respecting his freedom and spontaneity, invention and ideas, an attitude open to a child's suggestions, respecting his right to make mistakes,
- **the rule of respect for a child's personal dignity**, unconditioned acceptance of him as a person,
- **the rule of preparation and organisation of the didactic - educational environment**, conforming to a child's needs and possibilities, in other words adjustment of the classroom furnishing and equipment to a pupil's height, weight, level of psychophysical proficiency, resistance to stress, level of sensitivity and cognitive competency; "the provision of stimuli arranged according to the degree of the possibility of controlling an error"[28],
- **the rule of diagnosing events connected with learning**; a teacher observes children and on the basis of this he prepares notes, an individual record of a child's development history, he collects the products of a pupil's work, analyses the collected material in order to evaluate the pupil's progress,
- **the rule of organising social life**, that is the elaboration of common moral and social standards obligatory in the group[29], creating an ordered and harmonic environment for work,
- **the rule of multiple influence on children's development**, stimulating of intellectual, practical and emotional activity, application of the method of free work (exercises, observation, work with resource materials, a method of independent overcoming of problems, expressive methods and didactic games).

Accepting the assumption that the teaching process constitutes a natural supplement to the learning process, Kratochwil defined the rules of a child's work, which are as follows[30]:

- the rule of a structured, systematic progress, programmed by the organisation of a child's surrounding,

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child's needs as well as approval for various forms of activity, including "freedom for creative power which is a vital urge to the development of individuality" (M. Montessori, [in:] M. Miksza, *To Understand Montessori*, Kraków 1998, OW „Impuls", p. 75). Freedom from a social point of view is a gradual loss of child's dependence on an adult's help, due to the development of will and self-discipline at the same time. Freedom from a pedagogical point of view consists in non-interference in a child's free work, freedom seen from a moral perspective is connected with the art of making one's own, independent choices, making decisions, increase of responsibility for oneself, one's own acts and the world (see. M. Miksza, *To Understand* ..., op. cit., pp. 75-78).

[28] Ch. Galloway, *Psychology of Learning and Teaching*, vol. II, Warszawa 1988, PWN, p. 201.

[29] Kwiatkowska M. (ed), *Principles of the Infant Pedagogy*, Warszawa 1985, WSiP, p. 59-60.

[30] Kratochwil L., *Montessori`s* ..., op. cit., p. 40.

- the rule of immediate reinforcement by means of working with a self-correcting didactic material,
- the rule of internal motivation – the feeling of satisfaction after correct performance of a didactic task,
- the rule of individual progress, conforming to the "internal development plan", pupil's possibilities, interests, predispositions,
- The rule of mastering and achieving perfection by means of individual exercises[31].

Education for development

Concentration in the teaching process **on organising conditions for a pupil's independent activity** results in the fact that the educational targets are achieved taking into account «*the dynamics of their transformations and development*»[32].Pupil's activities, stimulated by didactic materials lead to subsequent, higher level achievements: **self-service** sills, such as a control over one's own body, **elementary – school** ones: reading, writing, calculating, etc, and **universal** ones: planning, designing and evaluating of one's own work[33]. Materials are thus designed and interconnected in such a way to show «*developmental lines in the range of particular psychomotor functions, skills and efficiency of a child*»[34]. Such a structure assures the continuity of educational influences in particular stages of the development. The notion of „developmental lines" means that «*the readiness to performing a learning task consists in previous mastering of each partial task essential to performing the main task; every task is rooted in the past and is a seed for the future*»[35] Materials are designed for individual discoveries and research. Knowledge enrichment, creation of notions in the range of all basic areas of education are a consequence of a child's free activity.

Instead of a conclusion

There is no other way of improving the education system than the activation of pupils and creating such a context for learning which they like. It is necessary to direct pedagogues' interest to recognising pupils' needs and to planning activities which correspond to children's life, allow them to learn, examine and create knowledge which is true in the contemporary world. Education should be identified with forming the school process that is functional for a child, it should be acknowledged that a child has a right to free development conforming to his rights. «***Do not forget that children and young people create a huge nation, [...] which is almost everywhere crucified in school desks, which almost everywhere - in spite of the fact that we talk about democracy, freedom and human right, is a slave of a school order, intellectual rules, which we impose on it***»[36].

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[31] It can be paraphrased: the shaping of the feeling of one's own competence or behavioural mastery (see. A. Brzezińska, *What is Active Participation of a Pupil and Teacher?*, [in:] G. Lutomski editor), *Child in the World of People and Objects*, Poznań 1994, Fundacja Humaniora Press, p. 33; M. Kielar-Turska, *Cognitive, Language and Communication Competences of a Child*, [in:] R. Piwowarski (editor) *Child Teacher - Parents. Educational Contexts*. Białystok-Warszawa 2003, Białystok University Press, p. 279-284).

[32] Compare. Bałachowicz J., *Initial ...*, op. cit., p. 85.

[33] I. Potęga, *Integral initial learning*, Warszawa 1995.

[34] M. Kielar, *Programme basis for educational and didactic work in an infant school*. Materials for a discussion. A copied script, 1983, p. 16.

[35] Galloway Ch., *Psychology ...*, op. cit., p. 205.

[36] M. Montessori after E. Eckert, *Child ...*, op.cit., p. 22-23.

2. Empirical research

2.1 Some Recent Empirical Research on Montessori Education in Italy

by Clara Tornar (University of Roma Tre, Centre for Montessori Studies, Italy)

In Italy the study of Montessori pedagogy has consisted of a great many contributions of a historical, theoretical and applicative interest. However, there are still few scientific contributions coming from studies of an empirical nature enabling an analysis of Montessori pedagogy on the basis of data from systematic observations and experimentation. In my view, the reasons for this are linked to factors common to other countries, and on which I shall dwell in my final remarks, and also to some historical-cultural factors specific to the Italian situation, where interest in Montessori pedagogy has long been finding difficulty in taking root in those very environments such as universities more directly designated for research. Nevertheless, at present the attention for the development of empirical research lines is very much alive, and some significant projects have already been started up in this direction.

The aim of my contribution is to outline the conceptual framework these projects are based on and to present the research lines they revolve around.

1. The Main Research Questions

There is no doubt that, in the light of the most recent knowledge on the teaching-learning process, today we are able to appreciate Maria Montessori's educational approach with greater awareness, her view of education as a process geared to promoting self-guided learning and the development of autonomy, and her view of the child as an active builder of his own skills. For the same reason, we can more clearly share the characteristics of the Montessorian learning environment, in particular:

- the presence of scientifically determined learning materials;
- the attention paid to psychomotor, cognitive and social development;
- freedom of choice of activities and respect for individual learning pace;
- the enhancement of self-discipline;
- close correspondence between ability and learning materials.

It is perhaps superfluous to note that these aspects appear particularly inviting to the researcher. The main research questions they raise concern both the quality of psychomotor, cognitive, affective-motivational and social type processes occurring within the Montessorian learning environment, and also the features that this environment takes on in current contexts, or its correspondence to Montessorian requirements. The projects I shall refer to start from these very research questions.

2. Some Pilot Projects

One study priority underlying the investigations carried out so far consists of the need for a scientifically reliable survey of the ways Montessori teaching is conducted in various contexts. Although Montessori schools are a specific reality within the Italian school system, little is known of their actual organization and of their conformity to quality standards or to criteria enabling an understanding of their stated methodological specificity. The studies I shall present aimed to meet this need by exploring both some specific aspects of the learning environment and some broader issues linked to the reconstruction of the organizational and management identity of Montessori schools. One of them explores the learning processes with particular reference to the learning-to-learn construct that, according to the requirements of Montessori pedagogy more broadly shared today, should be one of the priority objectives of these schools.

2.1 The Method "in action": a Descriptive Study

The general question underlying this project carried out at University of Roma Tre[1] is whether in the current didactic contexts based on the Montessori method there are elements of specificity characterizing them with respect to other contexts. In principle, the didactic organization of Montessori schools has certain features that distinguish it from the teaching methods used in other schools not methodologically defined. Since the Italian school system does not envisage a procedure for the accreditation of Montessori schools, this statement must still be verified. Bearing in mind the methodological principle underlying the Montessori learning environment, the research aims are the following:

1. identifying the main *typologies* of activity in which subjects are involved in Montessori classrooms
2. examining the *ways* these activities are conducted
3. identifying the *source* of the stimulus
4. assessing the frequency of teacher-pupil and peer *verbal contacts*

Eighty-nine subjects attending Montessori and non-Montessori type classes of pre-primary schools were observed, according to a time sampling technique based on variable intervals. As regards the first objective, data show that the learning tasks carried out in Montessori classrooms are mainly geared to activities classifiable as "psychomotor tasks" and "cognitive tasks." The latter are particularly significant in Montessori classrooms if we examine their typology: in Montessori classes, they are mainly linked to activities such as those connected to writing, reading and logic-mathematics, which are completely absent in those classrooms adopting another teaching method. In any case, the three kinds of activities are distributed differently with respect to age, with a prevalence of psychomotor activities in subjects aged 3-4 years.

As regards the second objective, in Montessori classrooms there is a prevalence of individual instructions that is, instructions provided by the teacher to the individual pupil rather than to the whole class, as is instead more frequently the case in the non-Montessori classrooms. As regards the third objective, the more frequent occurrence

[1] See C. Tornar, *Il metodo in azione: analisi di dati*, in Centro di Studi Montessoriani (Ed.), *Linee di ricerca sulla pedagogia di Maria Montessori*, Franco Angeli, Milano, 2005, pp. 13-24; C. Tornar, la pedagogia di Maria Montessori tra teoria e azione, Franco Angeli, Milano, 2007, pp. 228-240.

recorded in Montessori classrooms of activities carried out individually by pupils would appear to provide an empirical confirmation of the principle according to which the learning tasks in the Montessori method essentially envisage tasks of this type. Nevertheless, collective activities are a frequent occurrence in Montessori classrooms and, although to a lesser degree with respect to non-Montessori classrooms, still constitute a considerable part of the activities. As regards the fourth objective, verbal contact between children is prevalent in both types of classes, but a much greater frequency of child-teacher verbal contacts occur in Montessori classes.

On the whole, the analysis of the observational data gathered so far enables us to draw some initial conclusions on the didactic organization in schools that adopt a Montessori approach and on the specific connotation that the teaching-learning activities have within them.

2.2 The Identity of the Montessori School

The identification of the organizational, structural and pedagogical profile of Montessori schools and their meeting specific methodological requirements is the subject of a multiple case study carried out in eight Italian schools. This study was accepted as PhD dissertation at Roma Tre University [2]. The sample of schools is composed of eight schools with a Montessori approach, selected according to the following criteria:

- pedagogical representativeness (long tradition in applying the method)
- presence of the educational *continuum* (pre-primary and primary school)
- representativeness at the institutional level (public and private school)

The survey of the structural, organizational and didactic aspects of the schools taking part in the case study was carried out by means of questionnaires made available to teachers and school heads, observation sheets of classrooms activities, and an evaluation scale to assess quality. The empirical data gathered were subjected to both qualitative and quantitative type analyses and this led to the drawing up a profile of the Montessori school, in which the strengths and weaknesses of each school were analysed. From a transverse comparison, a general picture emerged, highlighting a) the considerable diversity of the structural, organizational and methodological requirements among the schools examined; b) how organizational and structural variables constitute an important factor in the realization of Montessorian educational principles.

2.3 Learning to Learn in Montessori Schools

Learning to Learn in Montessori Schools is the theme of an exploratory study carried out in elementary schools with the following objectives: 1) teachers' and children's conception of learning to learn; 2) the role of assessment practices in the acquisition of this meta-competence; and 3) the analysis of potential differences in learning power of children in Montessori versus "traditional" classrooms. This study was accepted as PhD dissertation at Roma Tre University[3].

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[2] M. Salassa, *La qualità della scuola Montessori in Italia. Uno studio di caso multiplo*, PhD dissertation, Università degli Studi Roma Tre, Dipartimento di Progettazione educativa e didattica, to be bublished.
[3] C. Stringher, *Imparare ad apprendere e valutazione. Studio esplorativo in classi primarie tradizionali e Montessori*. Phd dissertation, Università degli Studi Roma Tre, Dipartimento di Progettazione educativa e didattica, to be published.

From a socio-constructivist perspective, the methodology adopted to answer research questions was focused on two qualitative-quantitative case studies. Recruitment of schools required that they offer both Montessori and conventional education. Focus groups allowed an analysis of teachers' conception of learning to learn. For Montessori teachers only, an in-depth investigation on assessment practices connected with this meta-competence was carried out with a self-administered questionnaire.
Any differences in learning power of fourth graders (9 year-olds on average) in the two research groups have been polled with the Effective Lifelong Learning Inventory (ELLI). A final open-ended question was included at the end of the questionnaire to gather children's definitions of learning to learn.

The teachers interviewed express a broad conception of learning to learn, which is close to meta-cognition, yet they seem to neglect the basic features of this meta-competence in children. According to respondents, the assessment of learning outcomes does not interfere with the acquisition of the capacity to learn, while studies on the effects of assessment on motivation for learning would purport the opposite view. Yet, the more problematic element seems to be the assessment of learning to learn: it seems teachers do not quite know what they are measuring when they claim they appraise this aspect in children. At any rate, this remains an open question even within the international debate.

As hypothesized, children, given their age, describe a narrow learning to learn conception. Still, approximately one child out of five expresses a broad conception, and these are mainly girls in Montessori classes. In five ELLI dimensions out of seven, Montessori children obtain better scores than children in conventional classes. In particular, when compared to their counterparts, Montessori children seem significantly more persevering and resilient in their learning tasks.

3. Some final remarks

On the whole, the projects I have outlined establish research lines of particular interest for the Italian school system, and which are worth studying more deeply on a broader scale. In this regard, it would be important to have a convergence of the research efforts on the part of the researchers concerned. This would enable sharing within the scientific community even some decisions on the criteria adopted in conducting this kind of investigation. For example, the elements that should be used in order to select the group of Montessori and non-Montessori subjects, and the characteristics to be used in order to distinguish a "Montessori" school from a "traditional" one.
In order to broaden such studies, it would, however, be necessary to attract greater interest and involvement on the part of schools themselves. One of the obstacles in carrying out studies on Montessori education is the schools' resistance to this kind of study and to the use of evaluation tools. I was particularly surprised, for example, by the fact that even one school we had classified as "authentically" Montessorian actually refused the questionnaire for evaluating the learning meta-skills, on the grounds that this type of tool is not in line with Montessori philosophy. More generally, the schools showed a certain uneasiness as regards using evaluation tools, probably because they tend to associate them with forms of external control: this element comes to light even in studies carried out by researchers in other countries. For this reason, we deemed it appropriate to organise a series of meetings with teachers in which to jointly examine various aspects concerning research in the education field and to discuss the positive impacts it could have on the

school itself and on its *modus operandi*, in the sense that it would enable the start-up of important reflection processes in the sphere of didactic action.
A second and more important reason for the difficulties in conducting a study of a broader scale on Montessori education in Italy is the low number of schools (a figure that is decreasing with the increase in the school level) and their extreme fragmentation, both as regards juridical status (public or private) and as regards their distribution in the country: an extremely diversified picture, as shown by a study carried out some years ago at the Centre for Montessori Studies, on the distribution of Montessori schools in Italy[4]. This makes defining and comparing groups a very complex operation.
However, being aware of these problems is already a first step towards dealing with them and an incentive to broadening the debate and discussion so that it will be possible to share the decisions and to broaden the horizons of exploration of a really appealing study field.

[4] See M. Salassa, *La diffusione delle scuole Montessori in Italia*, in Centro di Studi Montessoriani, A*nnuario 2003*, Franco Angeli, Milano, 2004, pp. 75-92.

2.1.1 The Quality of Montessori Schools in Italy: a multiple case study

by Monica Salassa (University of Roma Tre, Centre for Montessori Studies, Italy)

1. Research problem

Within the Italian system of education, Montessori schools, which are fewer than in other European countries, have a specific role about which we know too little. Since there is no system of monitoring and accreditation of the main characteristics of this kind of school, this research project therefore intends to investigate the structural, organizational, and pedagogical features which contribute to determine the identity of the Montessori school and its quality.

The main research questions are:

- How can we recognize an "authentic" Montessori school? More specifically, what structural, organizational and pedagogical characteristics must a school committed to Montessori education have?
- What are the factors that facilitate or block the fulfilment of an "authentic" Montessori educational model?

The research has thereby been defined around the following specific objectives:

1. Identify the structural, organizational, and pedagogical aspects contributing to determine the identity of Montessori schools;
2. Identify the characteristics of the teaching staff professional profile in the educational institutions under study;
3. Identify the characteristics of the personal and professional profile of the manager/director who leads the educational institutions under study;
4. Identify procedures and test tools for detection of the external evaluation practices;
5. Make a comparison between the profiles of organizational, structural and pedagogical quality of educational institutions involved in the multiple case study.

As part of the survey, there was an identification of indicators of the Montessori school that enabled an initial assessment of compliance of the various schools examined to the quality criteria considered specific to a Montessori school.

1.1 The theoretical model: a Montessori school quality integrated map

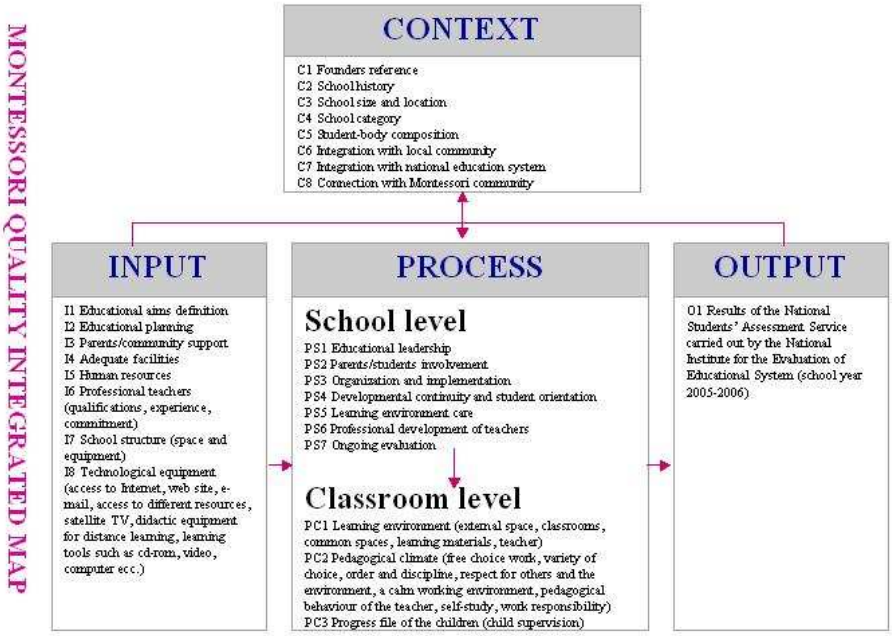
The model used to analyse the quality is an adaptation of the integrated model of school effectiveness proposed by J. Scheerens (Scheerens, 1990, 1992, 1997). As is well-known, this model involves the study of interactions between different components of the investigation on the assumption that the configuration and/or modification of one of them has an impact on the whole school activity, thereby influencing the functioning either in a positive or in a negative way.

In the present research the original proposal by Scheerens was adapted taking into account the features of the Montessori school and previous surveys on the analysis of school quality carried out in Italy with the use of indicators (Bondioli, Ferrari, 2000). The result is a model for assessing the quality of Montessori education according to a systemic approach that involves the study of interactions between different components of this type of school.

The scheme presented in Figure 1 identifies the areas considered as most significant for our investigation. They represent interesting areas of exploration to be analysed in relation to the quality criteria identified as specific to the Montessori model.
In particular, the four macro-areas of the original model, namely Background, Resources, Processes and Outcomes, remain unchanged. Further articulation of the quality areas functioned as follows:

- ✓ the "Context" area features eight elements exploring the history of the institution, its size and its location, composition of the school population, relations with the local community, with the school system in general and with the Montessori community;
- ✓ the "Resources" area features eight elements exploring the educational purpose and design of the school, parental involvement, materials and human resources, the professionalism of teaching staff, other resources consisting of structural space and equipment, technological equipment of the institute, especially Internet and electronic mail services access;
- ✓ in the "Process" area we considered the division made by the reference model that distinguishes processes at a school level and processes at a classroom level. At a school level, seven areas were distinguished to explore the style of management, participation of parents and pupils, the organization and functioning of the institute, the continuity of education and the processes of guidance, care of learning environment, professional development of teachers and evaluation processes activated by the school. At a classroom level, however, areas considered to be significant were those directly attributable to the special characteristics of the Montessori method with three main areas of exploration: PC1 The learning environment, PC2 The pedagogical climate, PC3 The progress file of the children (documentation, evaluation);
- ✓ in the "Outcomes" area, pupils achievement in terms of the National assessment service, INValSI, for academic year 2005-2006 was considered.

Figure 1 - *Montessori school quality integrated map (adapted from J. Scheerens, 1990)*



2. Methodology

The research was carried on through a multiple case study that involved eight Montessori schools selected on the basis of the following criteria:

a) pedagogical performance (a long tradition in the application of the Method);
b) presence of the educational continuum (Casa dei Bambini and primary school);
c) institutional identity (public school or private school);
d) geographic location (north, centre and south of Italy).

The methodology of case study involves the use of an integrated research strategy, capable of combining survey instruments appropriately responsive to the needs of in-depth investigation and time constraints, through the convergent and the effective use of a methodological triangulation between multiple sources and techniques of investigation (Cecconi, 2002), thus allowing evidence collected by different techniques easily to converge and confirm the reliability and veracity of a particular result.
With reference to the Montessori integrated quality map discussed earlier, the various tools used for investigation were[1]:

1. interview of expert Montessorians (PC - Preliminary step to field work).
2. Interview of Head Teachers (PS - Step 1).
3. Instrument A: Structural and organizational aspects (C, I, PS - Step 2).
4. Instrument B: Pedagogical program aspects (PC - Step 4, internal evaluation; PC - Step 8, external evaluation).

[1] In brackets the abbreviation used in the map for each area the instrument investigates and the phase of field work in which the tool was used.

5. Instrument A) and B) evaluation paper (Step 4).
6. Teachers' files (I, PS – Step 5).
7. Classroom observation (PC – Step 6).
8. Photo-documentation (I, PS, PC – Step 7).
9. Document collection (Step 3).

The instruments functioned in the following way:

1. Interview of expert Montessorians (PC - Preliminary step to field work).
The interview was conducted to gather information, opinions, experiences expressed by leading figures in the history of the Montessori movement in Italy.

2. Interview of Head Teachers (PS - Step 1).
It was the first of the survey instruments used in the field work during the visit to schools. Its purpose was to investigate training, opinions, style of management and the competence of the manager: these were considered to be important conditions for possible impact on school quality.

3. Instrument A: Structural and organizational aspects (C, I, PS - Step 2).
This tool is complementary to the "Instrument B: School Questionnaire. Aspects of the pedagogical program".
Overall, the instrument consists of 60 questions with closed and/or open response investigating quality areas related to aspects of context, resources and processes at a school level (see Figure 1). It is divided into seven main sections which identify as many areas of educational quality. These areas are interconnected and closely related to process conditions (both at a school and at a classroom level) indicated in the map of quality, and comprise a first insight on the quality declared by the school.

4. Instrument B: Pedagogical program aspects (PC - Step 4, internal evaluation; PC - Step 8, external evaluation).
The overall purpose of the instrument is to establish a system of indicators that better capture the specific features of Montessori education.
It is divided into 3 areas, each relating to a different aspect of specific Montessori quality:

- area I - The prepared learning environment.
- Area II - The pedagogical climate.
- Area III – The progress file of the children.

Each area was divided into one or more sections, each of which had a number of indicators. The total number of indicators was 158 (83 within Area I, 70 within Area II, 5 within Area III).
For each indicator included in the instrument a score on a scale of 1 to 4 was assigned (1 = minimum and 4 = maximum). See example, Figure 2.

Figure 2 - *Instrument B: School Questionnaire. Aspects of the Pedagogical program (Area I - The prepared learning environment. Section E: The teacher. Casa dei Bambini/Primary school)*

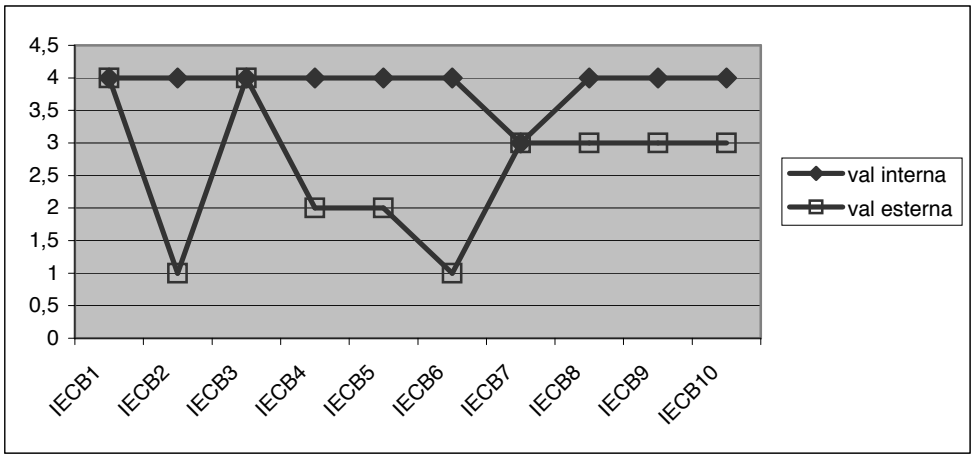
Area I – The prepared learning environment									
Casa dei Bambini					**Primary school**				
Section E The teacher									
1	**2**	**3**	**4**		**1**	**2**	**3**	**4**	*Further observations*
				E1 He/she organises periods in which the children can work independently					
				E2 He/she provides weekly brief group lessons/short additional lessons					
				E3 He/she promotes autonomy of the children applying clear rules					
				E4 He/she provides one or more thematic lessons weekly					
				E5 He/she develops activities to motivate child involvement on a weekly basis					

The "Instrument B" was compiled by an internal evaluator at the same time the external evaluator was carrying on the visit to the school. At the end you get two profiles as shown in Fig. 3 and 4, an example for Area I, Section E, Casa dei Bambini. The subsequent analysis of the concordance and/or scoring discrepancies between the different evaluating actors led to a detailed profile for each individual school.

Figure 3 - *Internal versus external evaluation. Quality section IECB (Area I - The prepared learning environment, Section E: The teacher, Casa dei Bambini) average score*

Quality factor	**Internal evaluation**	**External evaluation**	**Gap**
Area I – The prepared learning environment			
IECB (Area I, Section E, Casa dei Bambini) The teacher	3.9	2.6	1.3

Figure 4 - *Internal versus external evaluation. Quality section IECB (Area I - The prepared learning environment, Section E: The teacher, Casa dei Bambini) indicators*



5. Instrument A) and B) evaluation paper (Step 4).
This instrument consists of a card attached to the questionnaires "Instrument A" and "Instrument B", which aimed at detecting general impression on both the documents in relation to: 1) Clarity 2) Features 3) Effectiveness 4) Questions or words that have caused some confusion in interpretation.

6. Teachers' file (I, PS - Step 5).
This tool was used to collect data relating to the characteristics of teaching staff, in particular:

- initial training;
- length of service;
- career and teaching experience;
- further training and publications.

7. Classroom observation (PC - Step 6).
This tool registered the conditions of use of space, how the individual and small group activities are conducted, interactions between actors in the prepared learning environment. These records were useful to me as an external evaluator in the compilation of "Instrument B: School Questionnaire. Aspects of the pedagogical program".

8. Photo-documentation (I, PS, PC - Step 7).
The use of a photographic instrument is a source of further information for the case study. The objective of my reportage was to gather information about:

a) the itinerary of trips made within and outside the school facilities during the survey;
b) the living spaces, furnishings, materials, architectural solutions specific both at a classroom level and at a school level progressively visible to our eyes in conjunction with the observations carried out in the classroom.

This documentation served as constant terms of reference in the compilation of "Instrument B: School Questionnaire. Aspects of the pedagogical program" from my

point of view subsequent to the visit because it facilitated the recall to memory of forms, situations and peculiarities of the particular context being evaluated.

9. Document collection (Step 3).
Among the documents produced by the schools the POF (Piano dell'offerta formativa - School education program plan) was taken into account. This is a fundamental document testifying to the cultural identity and planned education actions in which explicit programming is declared by the school. The POF is a public document in which the school clarifies the objectives of its educational and didactic action and the organizational choices made for their implementation.

The following elements of the POF document were analysed:

- Formal characteristics: appearance, binding, number of pages, logos or citations;
- Structural characteristics and internal articulation of content;
- Presence/Absence of appendices, data tables, illustrative diagrams, pictures;
- Procedures followed in producing the document content and responsible parties, if declared.

2.1 Field work

Figure 5 outlines the structured timing of field research work, which included a visit lasting two consecutive days to each school involved in the research.

Figure 5 - *Field work scheme*

1st day: start of school visit	• Meeting with Head Teacher (interview, instrument A). • Meeting with Pedagogical Coordinator (instrument B, teachers' files, classroom observations schedule). • General visit of the school. • Document collection, classroom observation, photo-documentation.
2nd day: end of school visit	• Classroom observation, document collection, photo-documentation, collection of completed instrument A and B, collection of completed teachers' files. • Discussing feedback on visit with Head Teacher or pedagogical coordinator.

3. Data analysis

The empirical data collected during the research were analysed and presented in separate profiles for each case study in order to provide a detailed description of the single school case investigated. Subsequently, a cross comparison between school cases was made in order to give a comprehensive overview of the results emerging from the single school case profiles. The intention would be to provide analytical arguments allowing a comparison of contexts, resources, processes and situations that feature to a greater or lesser extent the quality of the educational service in the eight schools under study.
Given the richness and quantity of data collected, we considered it necessary to proceed in a non-exhaustive way in the cross-analysis between school cases, identifying some key elements common to all cases under consideration in order to seize, on the one hand, the

peculiarities, regarded as discrepancies between school cases, and, on the other hand, the generalizations, regarded as concordances between school cases.

3.1 Single case quality profile

For each Montessori institution, a profile was defined on the basis of data collected through the use of the tools developed for the field survey.
The profiles are divided according to a common structure within which from time to time the data on the single institution are described, analysed and commented.
Each profile includes the following sections:

a) *School identity card*: essential data for the definition of the reality under investigation.
b) *School background history*: information about the historical events which have made up the life of the school.
c) *School visit program review*: a brief report on the researcher's visit to the school and a first impression of the welcome and school functioning.
d) *Pedagogy and design*: a photo-documented overview presenting a description of the architectural and structural features of the establishment with particular attention to the preparation and use of internal and external environments for educational purposes.
e) *Organization and educational programme*: analysis of empirical data collection and documentation with respect to aspects such as "A. Organization", "B. Educational offer and evaluation", "C. The school as an open system" (school-family relationships, relationships with the local community, role within the Montessori community, network communication).
f) *Teaching staff*: qualifications, initial training, experiences, on-going further training, dissemination of Montessori culture.
g) *Leadership style*: analysis of the human and professional Head teacher profile.
h) *Aspects of the pedagogical programme: internal and external evaluation*: analysis and discussion of the empirical data collected through the School questionnaire on aspects of the educational project with a cross-comparison between feedback from internal evaluator (the teachers' coordinator/the reference teacher or contact person) and external evaluator (the researcher).
i) *National students' assessment service results (INValSI)*: results of and brief comment on the national survey of learning achievements in Italian, mathematics and science carried out in the second and fourth grades of primary school.
j) *Final evaluation of school quality*: evaluation summary of the single Montessori school case based on the peculiarities and the evidence thus far outlined, which highlights the strengths and weaknesses of the school investigated and which suggests possible actions for improving the overall educational quality of the school service.
k) *School bibliography*: bibliographic references reporting news or information on the single school's activities over the years.

3.2 Multiple case quality profile cross-analysis

The study of the profiles of single institutions involved in this case study research reveals quite a varied picture. Three types of school emerged:

- Institutions that express a high-quality realization of the Montessori method and that for this reason could be regarded as "model schools". These institutions could provide an important reference point for other institutions that are willing to hold themselves up to scrutiny and to make brave choices for a consistent implementation of the Montessori educational model;
- Schools with low or mediocre quality in the implementation of the Montessori method but with good potential for development according to the Montessori approach, but which would require embarking on a serious journey of self-analysis and in-depth reflection on the specific Montessori commitment in order to obtain a concrete improvement in the application. In this sense there may be a need for a radical change of route;
- Institutions showing a profile of "not-quality" in the implementation of the Montessori method due to a "systemic erosion" of the specific Montessori commitment that affects them in a more or less unconscious way. This process leads to a progressive and sometimes irreversible loss/distortion of the educational practices of the Montessori education paradigm.

Figure 6 - *Multiple case global average scores ranking according to the gap between internal and external evaluation*

Montessori school	**Internal evaluation**	**External evaluation**	**Gap**
7° Circolo Montessori – plesso via dei Marsi, RM N.B. Casa dei Bambini not Primary school	3.37	2	1.37
Tito Livio, RM N.B. Casa dei Bambini not Primary school	3.78	2.70	1.08
Nannarone, FG	3.64	2.69	0.95
7° Circolo Montessori – plesso Villa Paganini, RM	2.95	2.16	0.79
7° Circolo Montessori – sede centrale, RM	2.96	2.33	0.63
Vittorio Emanuele, BG	2.92	2.36	0.56
via Arosio, MI	3.23	2.70	0.53
Bignanico, CO	2.87	3.13	-0.26
Lemonia, RM	3.53	3.27	0.26
Bartolini, MI	3.52	3.42	0.1

The categories outlined here give an overall picture and, briefly mentioning a specific area, we would like to stress that in the course of research the importance of two elements facilitating the achievement of total quality according to the Montessori approach has emerged: a) the academic staff, their preparation, implementation of professional experience, the guarantee of staff stability; b) the school manager/director in her/his professional administration and management of the school, attention and care to the Montessori education paradigm peculiarities, personal commitment in terms of continuous development and improvement.
Moreover, evaluative data collected for the single school cases offer possibilities for further analytical reading. Taken as a whole, one can detect if there are common traits in the different school services or whether, on the contrary, each of them has peculiar characteristics that make it substantially different from the others. This cross-reading and analysis proposes a broader perspective on the Italian Montessori schools reality, creating the conditions for each Montessori school to reflect on its pedagogical identity and its role in relation to similar schools committed to Montessori education, but which might not be mutually known to one another.

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2.1.2 Is Montessori Better Preparing Children to Learn how to Learn than Traditional Education?

by Cristina Stringher (University of Roma Tre, Centre for Montessori Studies, Italy)

Background

A growing attention is being given in the political European context to the concept of learning to learn: originating from the Lisbon strategy, such attention has produced a series of official documents where learning to learn is defined as one of the eight key competencies needed for the European knowledge society of tomorrow (European Commission, 2002, 2003, 2004 a, b, c, 2005; Euridyce, 2002; European Network of Policy Makers for the Evaluation of Education Systems, 2006, Hoskins B., Fredriksson, U., 2008).

In spite of this attention, difficulties remain concerning answers to three major questions: what is learning to learn, how can it be measured and how can it be best "taught" and transferred to new generations (Stringher C. 2006; Hoskins B., Fredriksson, U., 2008).

The study here reported has attempted to provide possible paths to such answers in the Italian context.[1] This research has initially focused on a robust literature review on learning to learn and other related concepts to answer the first question concerning the nature of this notion. Results and theoretical relevance of Montessori method in developing such meta-competence are reported elsewhere[2].

The empirical study was dedicated to explore differences in learning power in 9- and10 year-old-children attending fourth grade traditional and Montessori primary school classrooms. In addition, I wanted to understand what type of concepts children in Montessori and traditional classrooms have developed around learning to learn[3].

The Effective Lifelong Learning Inventory (ELLI questionnaire) has been chosen to measure learning power in children, since this tool has been conceived to reach three

[1] This study has been carried out within Cesmon (Centre for Montessori Studies) of the Department of Educational Design at University Roma Tre. Answers to the second question are not being reported here, but the synthesis of results of the literature review led to the conclusion that there is yet no valid and reliable instrument measuring the entire learning to learn concept., as it emerges theoretically. An attempt in this direction has been made through the European Network of Policy Makers, and a report of a European Learning to Learn Pre-Pilot Project is soon to be delivered by the European Commission.

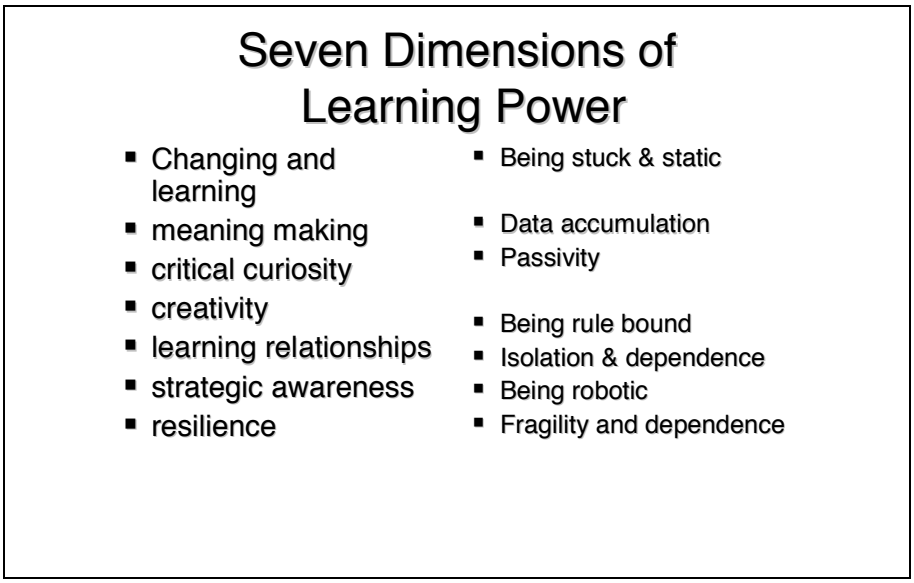
[2] Stringher C., *Imparare ad apprendere e valutazione. Studio esplorativo in classi primarie tradizionali e Montessori*. Phd dissertation, Università degli Studi Roma Tre, Dipartimento di Progettazione educativa e didattica, to be published.

[3] The same conception was investigated in a group of Montessori and "traditional" primary school teachers. In order to better understand how Montessori principles were applied in the two study cases, a separate analysis was carried out among Montessori teachers concerning initial and in-service training, pedagogical practice and tools, learning to learn concept and assessment practices, meaning of being a Montessori teacher, future developments of Montessori pedagogy. Such findings on teachers are reported in Stringher C., *Imparare ad apprendere e valutazione. Studio esplorativo in classi primarie tradizionali e Montessori*. Phd dissertation, Università degli Studi Roma Tre, Dipartimento Progettazione educativa e didattica, to be published.

major objectives[4]: to identify the characteristics of a good learner; to assess how an individual learner is positioned according to such characteristic dimensions at a given time; to use such information for a mentored intervention developing learning power by turning diagnosis into strategy.

Using this self-report questionnaire, seven dimensions of learning power have been identified by the British researchers and a schematic representation is offered in Fig. 1.

Figure 1 - *The seven dimensions of learning power. Source: Deakin Crick, 2004*



The focus of this paper is therefore to give an account of the use of the ELLI[5] tool to measure a major domain of learning to learn, namely that of learning dispositions, values and attitudes towards learning, which pertains to the affective-motivational core elements of learning to learn triggering also its cognitive dimensions. Such assessment has been carried out in Montessori and traditional classrooms in order to answer the third question, related to the type of learning environment and methodology to better cultivate this meta-competence in primary school children.

Learning to learn: a definition

The first step in the study was to set boundaries for this complex concept, variably referred to in literature as learning to learn, learning how to learn, learning competence to cite but a few definitions (Stringher C., 2006, 2008).

The result is a distinction of learning to learn from other related concepts such as general intelligence, self-regulated learning, learning strategies and styles, study strategies. Learning to learn is intended here as a meta-competence of higher hierarchical order than

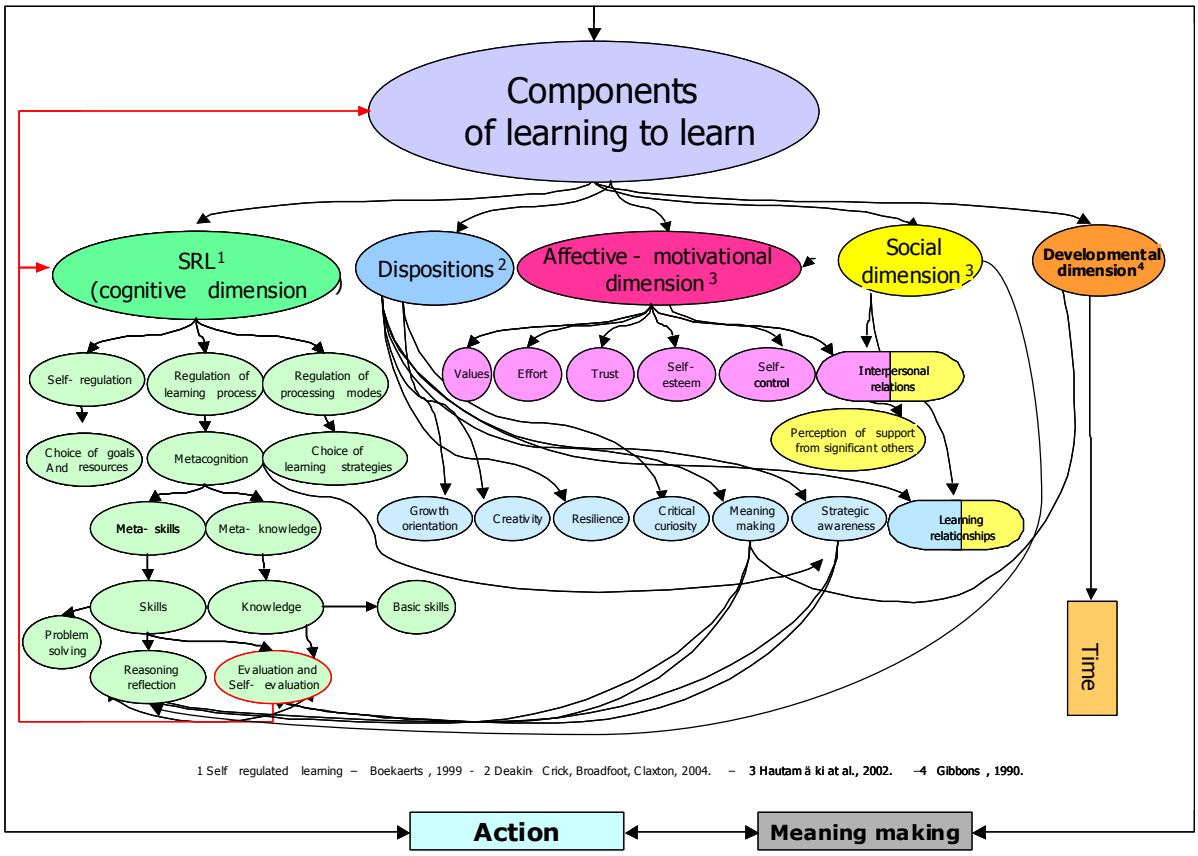
[4] This tool has been developed at Bristol University by a team led by Ruth Deakin Crick (Deakin Crick, 2009; Deakin Crick and Yu, 2008; Deakin Crick, 2007; Deakin Crick, 2004). In Italy the questionnaire has been translated and adapted for use in 4th grade ,with an additional question asking students to provide their own definition of learning to learn. This version is named ELLI-VITA from the acronym of the Italian for formative assessment of learning tendencies (Valutazione in Itinere delle Tendenze di Apprendimento).
[5] An additional question has been added to detect children's conception of learning to learn.

learning itself, which orchestrates an articulated series of capabilities and competencies with the ultimate focus on enabling the individual to take responsibility for their own learning trajectory over time. It is always and in any context about empowering the learner as an agent of their own life narrative. Learning to learn so defined is functional to the development of autonomous, creative, responsible and even divergent personalities.

Such a wide definition implies the learning agent's executive control of learning, as a process, and the enhancement of the learner's ability to negotiate specific learning situations. Such competence bestows the individual with increasingly higher command over modes, time and spaces of his/her own learning experience situated in diverse contexts. It mobilizes different energies while producing knowledge and improvement in learning how to learn through variations in learning experiences. Self-regulated learning, learning dispositions, social and affective-motivational dimensions of learning are all aspects of learning to learn, which needs to be understood in a developmental and lifelong perspective (Stringher, C. 2008 b).

The Figure 2 below offers a representation of the components associated with learning to learn identified through this literature review.

Figure 2 - *Learning to learn components*



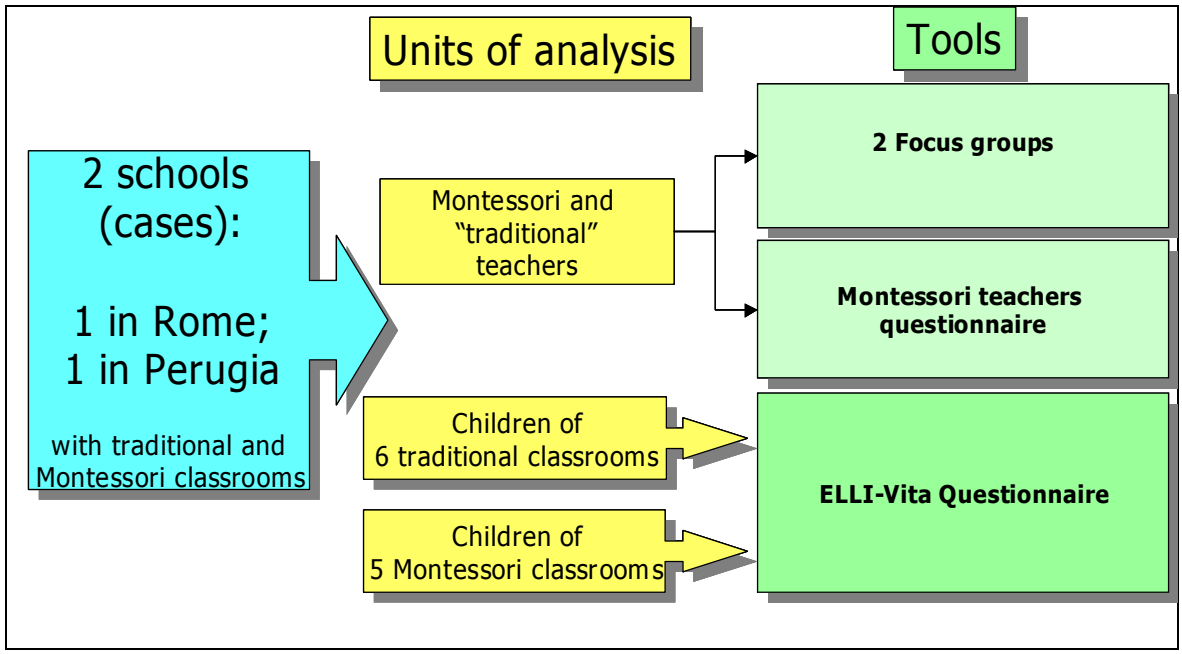
The study went on from this definition to analyze one of these components, precisely the learning dispositions connected to the social and affective motivational thrust to learning. This choice is motivated by the importance of affective-motivational factors in promoting

learning. These are indeed the dimensions which can be assessed through the ELLI questionnaire.

Sample and methodology of the entire study

Although this paper is focused solely on a fraction of the overall study, I will briefly describe the entire methodology to include that part within the complete set. The research design is synthesized in the following figure:

Figure 3. - *Study design in primary school settings, with cases, units of analysis and research tools*



A total sample of 190 students and 25 teachers was collected in the two school cases, both of them being state-owned establishments[6]. Considering that Italian Montessori primary schools are only 26, according to the most up-dated figures, the two schools could be said to be at least qualitatively "representing" the Italian Montessori tradition, with historical roots in Central Italy and in Rome in particular.[7] The schools have been selected based on their structure (Montessori plus traditional classes offered within the same establishment). This way I could ensure to recruit children coming from similar socio-economic backgrounds and exposed to different school types (Montessori versus traditional pedagogy).

[6] The definition of case study is that provided by Yin. In Yin R. K., *Case study research: design and methods*, Thousand Oaks, Sage Publications, 2003. The methodology to select the cases is similar to the "lottery" used in a study reported in Science in 2006. See for reference Lillard A., Else-Quest N., "Evaluating Montessori Education", *Science*, September 2006, vol. 313, p. 1893-4.

[7] According to a database of Montessori Italian schools maintained at Cesmon, 15 primary schools are located in Northern Italy, 8 in Centre and 3 in Southern Italy. The first Casa dei Bambini was founded in 1907 by Montessori herself in Rome. The diachronic diffusion of schools at different levels is documented in Salassa M., "Lo sviluppo delle scuole Montessori. Un esame comparativo", in Centro Studi Montessoriani, *Annuario 2003 – Attualità di Maria Montessori*, Milano, Franco Angeli, 2004. According to this source, 136 Montessori schools operate in Italy at all educational levels. Data on the universe of Montessori Italian schools are to be updated, but other sources indicate they could be fewer now.

Schools were chosen also and based on the actual availability of the school head, a condition that determined a convenience type of sample[8]. Careful attention should thus be paid to results, which are not to be generalized to the entire population without replication.

The study questions were developed according to the design and units of analysis. From teachers I wanted to know their conception of learning to learn, whether or not they make use of assessment tools on learning to learn competence, and what they think is the role of assessment in general to promote or hinder learning to learn. From children I wanted to investigate their conception of learning to learn; in addition I wanted to establish whether there are significant differences in learning power of children attending Montessori versus traditional classrooms. The study was based on a mixed method approach for data analysis[9].

The tools used to answer study questions are also pictured in the figure 3 above.
The following table represents the sample distribution of student questionnaires collected in the two schools/cities.

Tab. 1 - *Distribution of cases per city and type of pedagogy*

TYPE OF PEDAGOGY	CITY		Total
	Rome	Perugia	
Montessori	21	88	109
Traditional	35	46	81
Total	***56***	***134***	***190***

The table below accounts for gender distribution in the two schools per type of pedagogy.

[8] I have found a strong resistance among Montessori schools to allow researchers work within the establishments. Such a resistance has also impaired this study design. The following motives have been cited by head teachers to refuse to collaborate: the ELLI questionnaire is "far from Montessori philosophy"; the ELLI questionnaire has been deemed to be too difficult for the age of children to recruit for the research; simple refusal to participate in the study. One newly established state-owned school in Rome was willing to participate but did not yet have a fourth grade classroom.

[9] The focus of the study was not to test the ELLI-VITA instrument, at its first Italian version administration. However, Cronbach's Alpha .80 score for the entire scale shows that the questionnaire is quite reliable in measuring learning power. A consideration can also be made concerning the validity of this tool: the similar results obtained within the two schools tested and within the sub-sets of sampled populations, could be cautiously interpreted as proof of the validity of ELLI-VITA. Measures of Cronbach's Alpha on each of the seven dimensions scales are also provided in the appendix. Although these values are not very high, it must be remembered that in the parent British study (Deakin Crick, R,, Broadfoot, P., Claxton, G., 2004), Alpha's are generically lower at lower pupils ages, as our case could indicate. More evidence is needed, however, to answer these technical questions on the research tool.

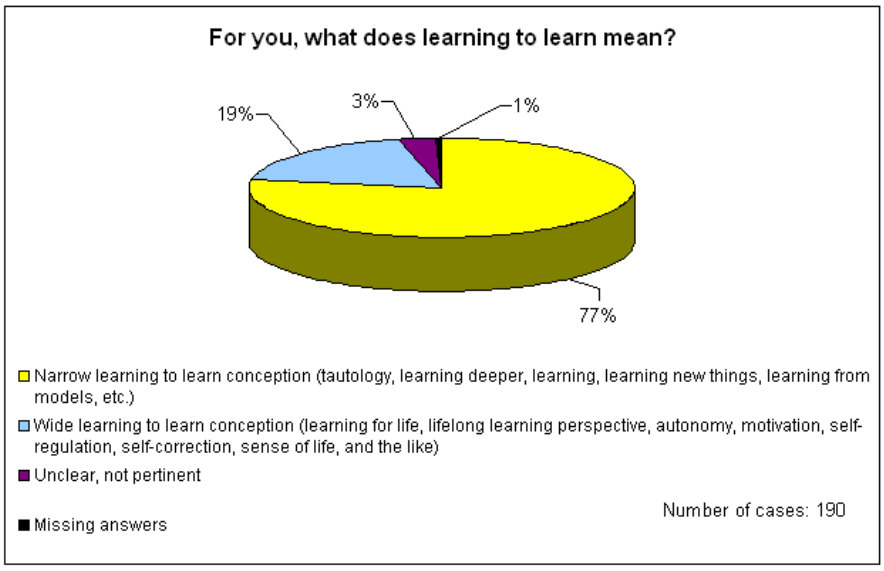
Tab. 2 - *Distribution of cases per city, type of pedagogy and gender*

City	Gender	Montessori	Traditional	Total
Rome	Males	11	15	26
	Females	10	19	29
Rome Total		*21*	*34*	*55*
Perugia	Males	41	20	61
	Females	47	26	73
Perugia Total		*88*	*46*	*134*
Grand total		***109***	***80***	***189***[10]

Main results

One of the major study questions aimed at understanding children's conception of learning to learn. The qualitative analysis of the open-ended question asking them to provide their own definition already offers some interesting results.
Out of a sample of 190 students, one only did not respond, and 137 different answers were collected, a positive aspect suggesting children were not copying ideas from one another. Successive recoding of raw responses led to classify definitions as wide or narrow conceptions of learning to learn according to Hounsell[11].
The pie chart of Fig. 4 reports the results: approximately 80% of children of this age either have a tautological conception of learning to learn expressed as "learning a lot", "learning deep", "learning new things", or give an unclear answer or do not answer.

Fig. 4 - *Conception of learning to learn in children of the two schools-cases*



[10] One student in Rome did not check his/her gender.
[11] A wide learning to learn conception among children includes aspects such as metacognition, reflection on one's learning, learning to learn for life and similar concepts, whereas a narrow conception is close to the concept of learning, or to "learn more", or other tautological concepts. I have adapted the wide and narrow definitions assuming chidren's age would impact the width of their conceptions on learning to learn. For a complete review of narrow vs wide learning to learn definition, see Hounsell, D., "Learning to learn: research and development in student learning", *Higher Education*,1979, vol. 8, no. 4 pp. 453-469.

The distribution of wide definitions in Montessori and traditional classrooms is very similar. This result seems coherent with Vygotskij's developmental theory of thought: at this stage, children seem driven by what Vygotskij termed "thought by complexes"[12], as opposed to "thought by concepts". This could explain tautologies and the syncretic, narrow definitions gathered. Also in piagetian terms, these children are in their concrete operations at this stage. Thus it is surprising that there were children who attempted to go beyond this, supplying wide definitions.

It seems interesting to report a translation of the collected conceptions to illustrate the richness in children's production: generic definitions such as "learning things" or "learning many things" (10 cases, 7 of which in traditional classrooms) and tautologies such as "learning something to learn" (male, 10 years-old, from a traditional classroom in Perugia) represent the narrow conception expressed by the vast majority of children of this age. Other examples of narrow definitions are superlatives such as "learning to learn means to learn very much", or tautologies as in "learning is a very important and amusing thing because you learn many things", or additive operations such as "learning to learn means learning always more things", or "the more you know, the more you progress", or "being more intelligent". Interesting to underline that even children consider learning a sort of intelligence which is enhanced by learning to learn.

All narrow definitions have one thing in common: the difficulty children have in distinguishing between learning and learning to learn. The major difficulty lies in the double word "learning/learn" which is really difficult for some children to code into a different meaning. It is as if the child at this age were "mesmerized" by these similar words and were not able to detach the significant from the meaning to designate something different. Perhaps an example of Vygotskij's thought by complexes.

On the other side, wide conceptions which come close to a meta-cognitive awareness of learning to learn are represented in definitions such as "understanding, memorizing, assimilating to learn things better" (male, 9 years-old, in a Montessori classroom in Rome), and "learning to study better" (male, 9 years-old, in a traditional classroom in Perugia), or "understanding the procedure, the technique to learn" (two males, 9 and 10 year-olds, in a Montessori classroom in Rome).

Other examples include definitions where the "meta-cognitive" component seems to prevail: "In a certain way, I wake my mind up again, making order to understand things better" (9-year-old girl in a Montessori classroom in Perugia). The organizational and social aspects of learning to learn emerge from another definition: "to better organize your abilities and to share them" (9 1/2 year-old girl in a Montessori classroom, Perugia).

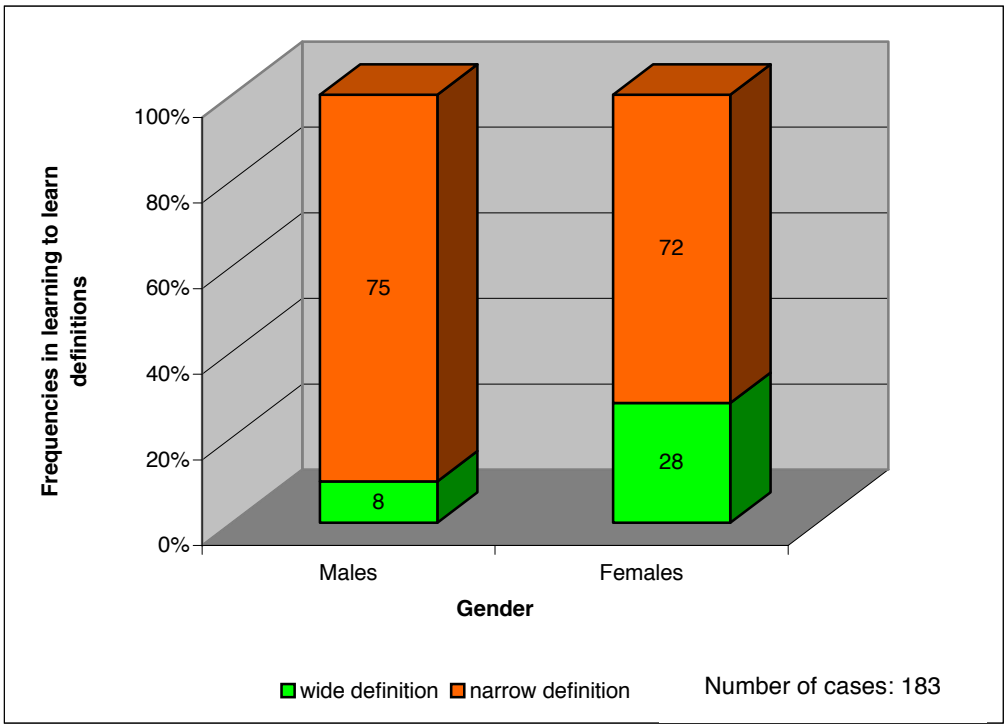
Other children concentrate on learning by themselves, autonomously, "without anybody to explain", but also learning "through experiences". In one case there is an extremely wide definition of learning to learn with all these elements together: "to learn by myself, with no-one to help me, turning to a model or referring to my experience" (girl, 9 years-old, traditional classroom, Perugia).
Another girl decodes learning to learn as a tool to confer sense to her own experience, as she wants to "understand the mechanism of things" (9 year-old, Montessori classroom in Rome).

[12] According to some other translations, "complex thinking".

Autonomy is associated with learning to learn for a small group of 6 girls and 1 boy which select this aspect as a basis for their definitions.

A cross tabulation of gender with type of learning to learn conception was carried out on the sample, netting unclear or missing responses, in order to better understand this relationship. The results are represented in Fig. 5 and Tab. 3. Within the group of 36 children with a wide conception, 28 cases are females and of these, two thirds approximately are attending Montessori classrooms (18 out of 28). There is a clear gender difference in the wide conceptions of learning to learn. Such difference, after a χ^2 test, is found to be statistically significant.[13]

Figure 5 - *Conception of learning to learn according to gender*



Tab. 3 - *Cross-tabulation of learning to learn conception with type of pedagogy and gender*

Type of pedagogy			***Learning to learn conception***		***Total***
			narrow	wide	
Montessori	Gender	Male	48	4	52
		Female	39	18	57
	Total		*87*	*22*	*109*
Traditional	Gender	Male	27	4	31
		Female	33	10	43
	Total		*60*	*14*	*74*
Grand total			***147***	***36***	***183***

[13] Statistics are as follows: $\chi 2$ (1, N= 183) = 9,67, p. 0,002 Cramér's Phi and V = 0,23, p. 0,002 Kendall's Tau = 0,23, p. 0,001.

In the ELLI-Vita questionnaire, these children do not present significant differences versus the total sample. The majority of those with a wide conception of learning to learn come from Montessori classrooms, although it's the gender the most robust independent variable.

Another quantitative study question concerned potential differences in learning power between "Montessori and Traditional" children. Descriptive statistics of learning power seven dimensions are shown in Tab. 4.

Tab. 4 - *Descriptives for the seven dimensions of learning power for the entire sample*

Statistics on the seven dimensions of learning power	Minimum	Maximum	Mean	Std. Deviation
Growth orientation changing & learning	8,33	100,00	73,25	18,46
Critical curiosity	10,00	93,33	61,00	13,23
Meaning making	16,67	100,00	65,23	15,08
Creativity imagination	14,81	100,00	57,04	15,57
Fragility & dependence	6,06	78,79	36,43	14,65
Strategic awareness	5,56	88,89	45,67	15,92
Learning relationships	18,52	96,30	59,36	16,38
Valid cases: 190				

The seven dimensions are all positive, except fragility and dependence: the lower this score, the higher is resilience in completing a task.

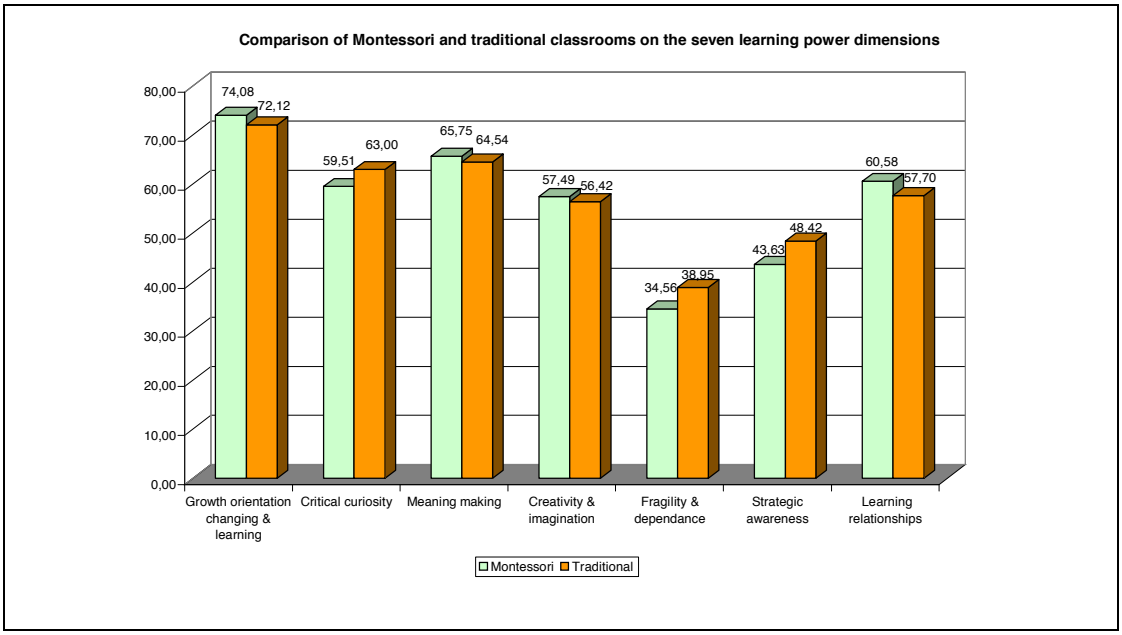
Learning power dimensions scores have been crossed with type of school to give a preliminary comparative result shown in Tab. 5 and graphically evident in Fig. 6.

Tab. 5 - *Mean scores on each ELLI dimension in Montessori and Traditional classrooms*

ELLI SEVEN DIMENSIONS	Type of school	Nbr	Mean	Std. Dev.	Std. Error
Growth orientation changing & learning	Montessori	109	74,08	18,16	1,74
	Traditional	81	72,12	18,92	2,10
Critical curiosity	Montessori	109	59,51	12,73	1,22
	Traditional	81	63,00	13,69	1,52
Meaning making	Montessori	109	65,75	14,45	1,38
	Traditional	81	64,54	15,95	1,77
Creativity & imagination	Montessori	109	57,49	13,85	1,33
	Traditional	81	56,42	17,70	1,97
Fragility & dependence	Montessori	109	34,56	12,39	1,19
	Traditional	81	38,95	16,99	1,89
Strategic awareness	Montessori	109	43,63	15,75	1,51
	Traditional	81	48,42	15,84	1,76
Learning relationships	Montessori	109	60,58	16,28	1,56
	Traditional	81	57,70	16,47	1,83

Interesting to notice that standard deviations in all dimensions are lower for the Montessori group, and this could suggest this type of school is producing more uniform and perhaps more equitable outcomes.

Fig. 6 - *Mean scores on each ELLI dimension in Montessori and Traditional classrooms*



The comparison shows that the dimensions "Growth orientation", "Meaning making", "Creativity" and "Learning relationships" obtain higher results in Montessori classrooms, while " Critical curiosity" and Strategic awareness" achieve higher scores in traditional ones.

The "Fragility" dimension receives much lower scores among Montessori children, meaning they are more independent, resilient in their tasks and also more related with significant others than other children. The difference is found statistically significant after an independent samples T-Test[14]. Students attending traditional classrooms, in turn, seem to be statistically more aware in their learning. The t-test does not allow to affirm the independence of the two distributions.

I carried out the same type of analysis also considering the independent variable "gender". Results are reported in Tab. 6.

[14] Statistics in appendix.

Tab. 6 - *Mean scores on each ELLI dimension according to gender.*

ELLI SEVEN DIMENSIONS	Gender	Nbr	Mean	Std. Dev.	Std. Error
Growth orientation changing & learning	Males	87	71,65	18,127	1,9434
	Females	102	74,67	18,796	1,8611
Critical curiosity	Males	87	61,15	13,097	1,4041
	Females	102	60,78	13,433	1,3301
Meaning making	Males	87	63,28	15,188	1,6283
	Females	102	66,83	14,925	1,4778
Creativity & imagination	Males	87	55,13	15,789	1,6927
	Females	102	58,61	15,35	1,5199
Fragility & dependance	Males	87	33,68	13,89	1,4891
	Females	102	38,8	15,004	1,4856
Strategic awareness	Males	87	44,96	15,382	1,6491
	Females	102	46,24	16,495	1,6332
Learning relationships	Males	87	57,77	17,182	1,8421
	Females	102	60,75	15,698	1,5544

This analysis results to be statistically significant for the dimension of "fragility": it seems girls are more fragile and dependent learners than boys[1].

In order to complete the comparison, I have also calculated scores per type of classroom (Montessori versus Traditional) and represented means in the radar charts of Fig. 7 below.

The similarity of the two profiles is graphically evident, the only difference being the lower fragility in Montessori children.

The same operation taking gender as independent variable yields similar results (Fig. 8). What is actually different is the profile of different individuals rather than mean profiles of groups of children.

[1] Statistics in appendix.

Figure 7 - *Profile comparison between Traditional and Montessori classrooms on the seven ELLI dimensions*

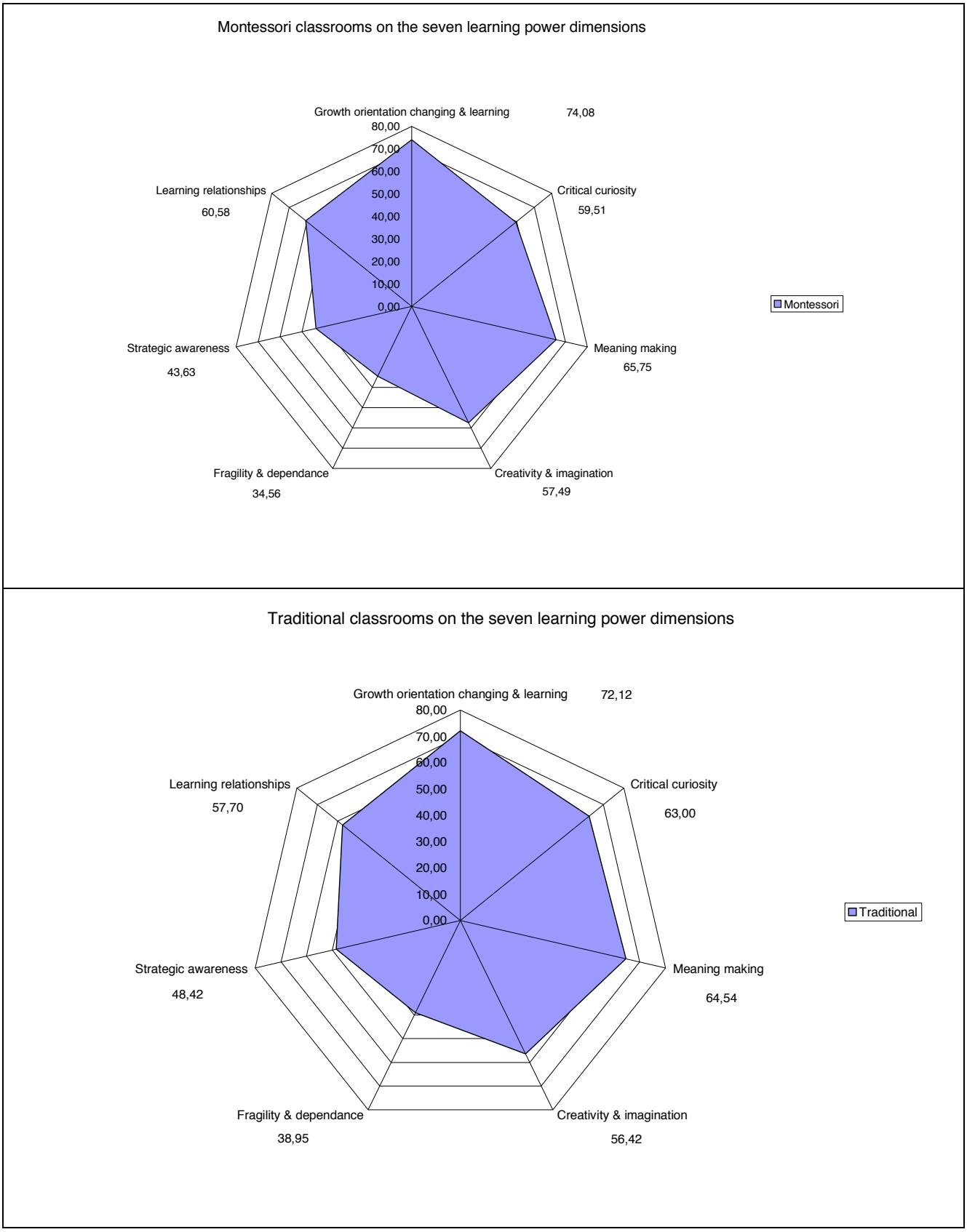
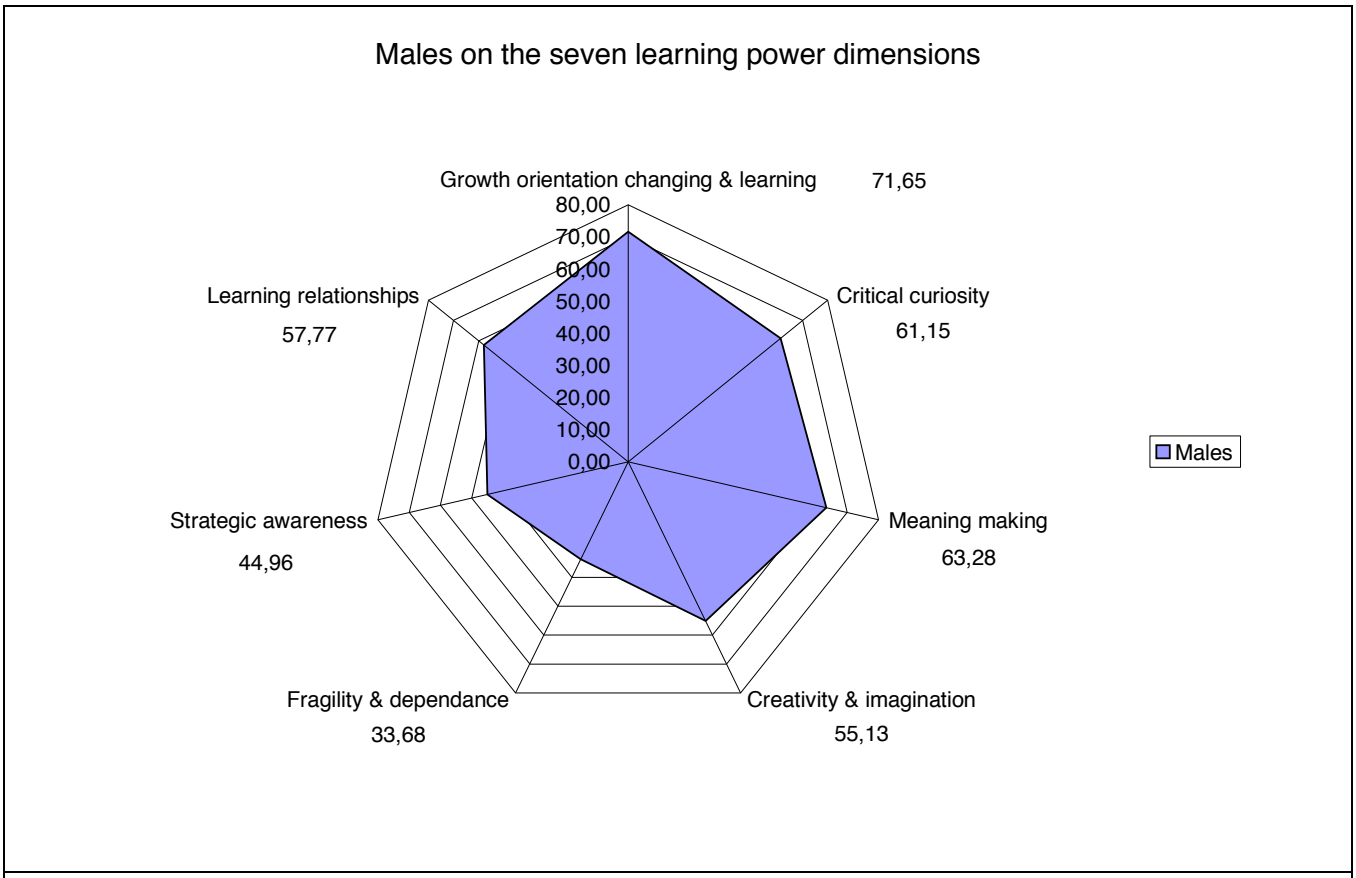
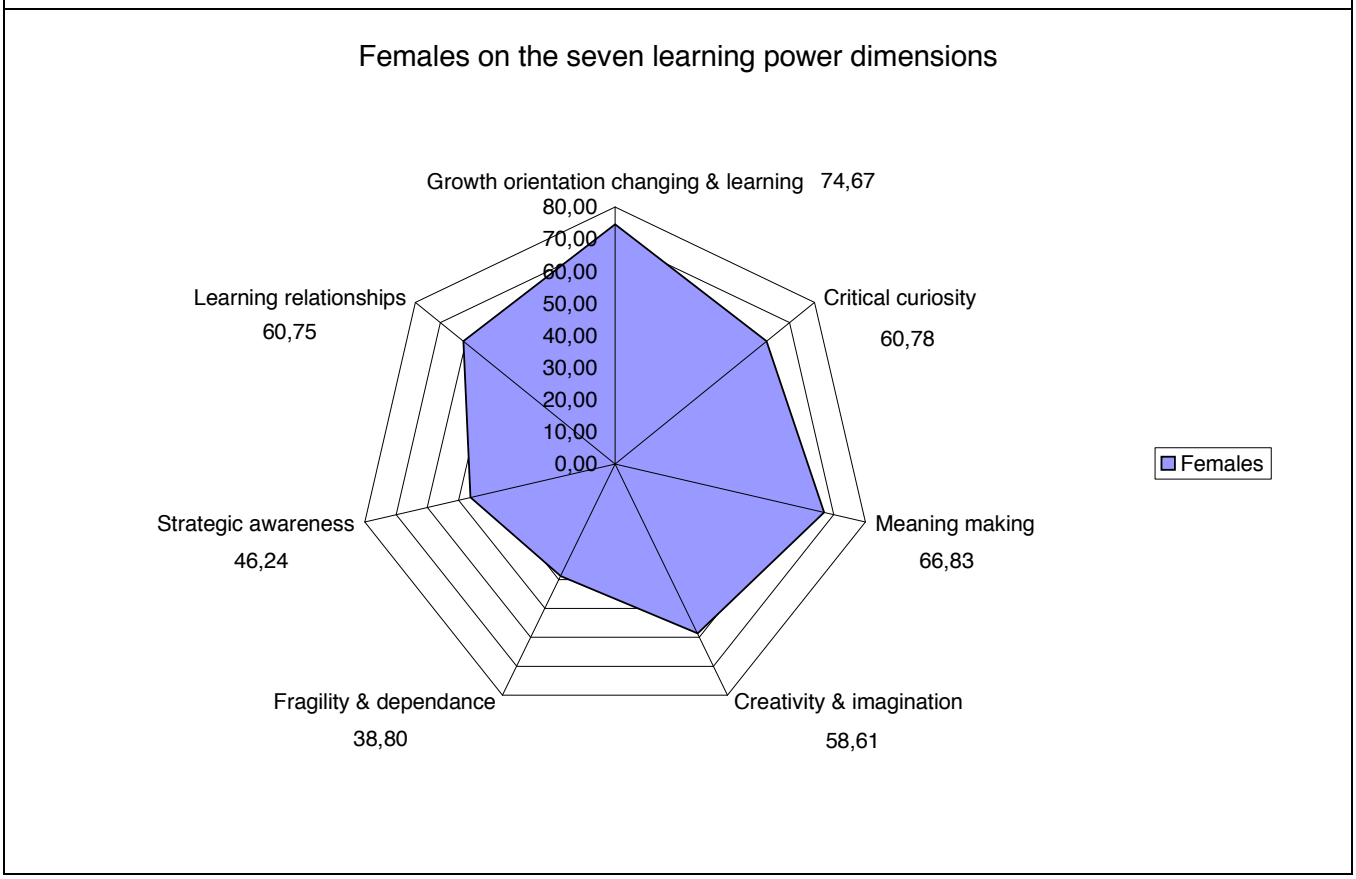


Figure 8 - *Profile comparison between males and females on the seven ELLI dimensions*





Differences become more visible when a K-means cluster analysis is performed on the seven dimensions of learning power to identify two groups of different learners. The result is pictured in Tab. 7. There seems to emerge a distinction between two groups of learners: one more efficient, scoring higher in all seven dimensions; the other weaker, receiving lower scores in all dimensions. The variable that best distinguishes the two groups is growth orientation. The fragility and learning relationship scores are instead quite similar in the two groups.

Tab. 7 - *Final Cluster Centers*

ELLI DIMENSIONS	Cluster	
	1	2
Growth orientation changing & learning	81,9	57,1
Critical curiosity	66,1	51,5
Meaning making	71,6	53,2
Creativity imagination	63,6	44,6
Fragility & dependence	37,9	33,7
Strategic awareness	52,4	33,1
Learning relationships	60,9	56,4

Since cases in this cluster analysis can be labeled by a pre-identified variable, I wanted to know which type of students (Montessori or traditional) belonged to the two groups and the result is shown in Tab. 8.

Tab. 8 - *Clusters composition*

CLUSTER	Type of school	Nbr of cases
Cluster 1	Montessori	73
	Traditional	51
Cluster 2	Montessori	36
	Traditional	30
Total nbr of cases:		190

The first cluster is far more numerous, with 124 cases out of 190. More Montessori pupils belong to the efficient learner cluster, although the numbers are small and they should be interpreted with great caution.

Conclusions

Overall, the two groups of children seem to be similar in their definitions about learning to learn and in their learning power. The vast majority only has a narrow, sometimes tautological conception of learning to learn. However, a group of girls in Montessori classrooms seem to conceive a much wider and articulated concept than other groups.

There seems to be a developmental origin of this aspect, also identified in studies carried out in Great Britain (Deakin Crick, R., Broadfoot, P., Claxton, G., 2004), but this study has not been conducted to ascertain the developmental hypothesis.

Also when analyzed in terms of their learning power, the two types of school environment are presenting similar profiles except on fragility, with Montessori students being better equipped autonomous learners and with again some differences in gender, only in some of the ELLI dimensions (fragility in particular).
The gender "bias" in fragility seems confirmed also from studies carried out in Great Britain, where the ELLI tool was produced (Deakin Crick, R., Broadfoot, P., Claxton, G., 2004).

All in all, Montessori students seem less fragile and more autonomous learners, while traditional classroom pupils seem more aware but also more fragile than their counterparts in their learning.
Montessorians are also more numerous when a cluster of "good learners" is created. A "school effect" was anticipated also in the British study cited above, but more cases are needed in my opinion to back this hypothesis with robust evidence.

Based on these results, the initial hypothesis that Montessori education better prepares students to learn and become lifelong learners seems not clear. However, some considerations should be made regarding these aspects.

First, I did not have any means to establish how "Montessorian" the two schools in questions are: in Italy, no particular standards are followed by Italian schools to be certified as Montessori environments. It would be interesting to analyze these two schools also with a protocol to certify Montessori education before saying these results on learning power are definitive.

Secondly, 59% of children in traditional classrooms of the Roman Montessori school come from Casa dei bambini of the same establishment: perhaps these children could have benefited by the Montessori "startup" they enjoyed prior to primary school[1]. This information could partially explain why scores among traditional children are not statistically different from Montessori's.
This problem refers to the study design, and could be taken in more account in future studies to be implemented elsewhere.

More generally, the fact that there is no definite interpretation of ELLI data among traditional and Montessori classrooms, could imply a more profound consideration: the learning power of children could be an accidental product of schools, regardless their pedagogy, as schools could not be working actively towards the objective of educating self-aware and autonomous lifelong learners. In other words, the scores I have collected could be the initial basis of learning power in these children, not an outcome measure of school quality. If this is true, the individual differences (also developmental) are what matters most together with family background of children influencing their leaning power, to be balanced with adequate pedagogic interventions.

[1] No data are available for the school in Perugia, but it seems reasonable to imagine a similar pre-school background also in those children.

More could be said also regarding the Italian culture producing a nation of more dependent learners, but this is something to be accurately measured in a wider study with higher means than mine.

There still remains the fact that those children with a wider conception of learning to learn and higher resilience and autonomy are coming from Montessori classrooms. A discovery which could be further explored in future studies either within or outside Italy, and in comparison with other "alternative" schools. As OECD seems to suggest to innovate education for the new millennium.[2]

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Appendix

Independent Samples Test — INDEPENDENT VARIABLE: TYPE OF SCHOOL

ELLI DIMENSIONS		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Growth orientation changing & learning	Equal variances assumed	,273	,602	,724	188	,470	1,9632	2,71164	-3,38592	7,31237
	Equal variances not assumed			,720	168,512	,473	1,9632	2,72820	-3,42263	7,34909
Critical curiosity	Equal variances assumed	1,621	,204	**-1,811**	188	,072	-3,4934	1,92874	-7,29816	,31134
	Equal variances not assumed			-1,792	165,311	,075	-3,4934	1,94953	-7,34259	,35577
Meaning making	Equal variances assumed	2,192	,140	,545	188	,586	1,2088	2,21617	-3,16298	5,58052
	Equal variances not assumed			,538	162,604	,592	1,2088	2,24858	-3,23140	5,64894
Creativity & imagination	Equal variances assumed	5,217	**,023**	,467	188	,641	1,0680	2,28931	-3,44800	5,58406
	Equal variances not assumed			,450	146,892	,653	1,0680	2,37224	-3,62010	5,75615
Fragility & dependance	Equal variances assumed	10,727	**,001**	-2,059	188	,041	-4,3884	2,13105	-8,59227	-,18459
	Equal variances not assumed			**-1,968**	139,515	**,051**	-4,3884	2,23005	-8,79748	,02062
Strategic awareness	Equal variances assumed	,068	**,795**	**-2,070**	188	**,040**	-4,7935	2,31592	-9,36207	-,22503
	Equal variances not assumed			-2,068	171,944	,040	-4,7935	2,31798	-9,36890	-,21819
Learning relationships	Equal variances assumed	5,046	**,026**	-2,284	188	,024	-4,3741	1,91526	-8,15222	-,59589
	Equal variances not assumed			**-2,219**	152,197	**,028**	-4,3741	1,97075	-8,26761	-,48050

Independent Samples Test INDEPENDENT VARIABLE: GENDER

ELLI DIMENSIONS		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Growth orientation changing & learning	Equal variances assumed	0,7494	0,388	-1,121	187	0,2636	-3,026	2,6986	-8,349	2,298
	Equal variances not assumed			-1,124	184,17	0,2623	-3,026	2,6908	-8,335	2,2831
Critical curiosity	Equal variances assumed	0,1172	0,733	0,1884	187	0,8508	0,3651	1,938	-3,458	4,1883
	Equal variances not assumed			0,1888	183,66	0,8505	0,3651	1,9341	-3,451	4,1811
Meaning making	Equal variances assumed	0,0006	0,98	-1,616	187	0,1078	-3,548	2,1958	-7,88	0,7839
	Equal variances not assumed			-1,613	181,29	0,1084	-3,548	2,1989	-7,886	0,7909
Creativity & imagination	Equal variances assumed	0,0057	0,94	-1,531	187	0,1274	-3,476	2,2698	-7,954	1,0019
	Equal variances not assumed			-1,528	180,61	0,1283	-3,476	2,2749	-7,965	1,013
Fragility & dependance	Equal variances assumed	1,7679	**0,185**	-2,418	187	**0,0166**	-5,118	2,1164	-9,293	-0,943
	Equal variances not assumed			-2,433	185,73	0,0159	-5,118	2,1035	-9,268	-0,968
Strategic awareness	Equal variances assumed	0,3011	0,584	-0,551	187	0,5821	-1,287	2,3339	-5,891	3,3177
	Equal variances not assumed			-0,554	185,49	0,58	-1,287	2,321	-5,865	3,2924
Learning relationships	Equal variances assumed	3,3821	**0,067**	-1,245	187	0,2148	-2,979	2,393	-7,7	1,7421
	Equal variances not assumed			-1,236	176,06	0,2182	-2,979	2,4103	-7,736	1,7781

ELLI SEVEN DIMENSIONS	***Cronbach's Alpha Coefficient***
Changing & learning	.64
Critical Curiosity	.53
Meaning making	.45
Creativity	.6
Strategic awareness	.41
Learning relationships	.6
Fragility and dependence	.64

2.2 From Absorbent Mind to Metacognition. Montessori classroom as a context of child's cognitive development

by Dorota Zdybel (University of Maria Curie-Sklodowska in Lublin, Poland)

„It matters much more to have a prepared mind than to have a good teacher"
(Montessori 1992, s. 167)

Introduction[1]

Pedagogy of Maria Montessori, although developed more than a century ago, stays amazingly inspiring and valid not just in some aspects, but as a whole educational system. Indeed, some contemporary readings and interpretations of Dr Montessori's books and lectures seem to discover new "hidden" aspects of her thinking that have been underestimated, not widely discussed or not appreciated enough. Nowadays, these aspects are becoming the source of interest for new generations of scientists, researchers and educators. Especially important stream of that interest are the attempts to deconstruct and reinterpret some important Montessori's concepts by referring and connecting them to the recent research in developmental psychology. Although the "radical Montessorians" guarding the purity of the concept might see some of the attempts as somehow seditious, I believe that they bring a significant cognitive value: they make us aware how many of Dr Montessori premises have been confirmed, substantiated and/or explained in depth by contemporary psychology and neuropsychology. One of those is an Absorbent Mind, the idea which underlies the construction of many developmental materials and didactic principles of Montessori's pedagogy. This article aims to present deep and complex connections between the idea of Absorbent Mind and the development of child's meta-cognitive awareness, widely recognized as the ability "to think about your own thinking". Although we are not going to find the notion of "meta-cognition" in the works of Maria Montessori, the idea itself seems to be intuitively close to her, immanently present in the construction and atmosphere of a prepared environment – one designed to facilitate independent construction of a child's own mental forces and skills, by answering to his natural developmental instincts.

The article consists of three parts. First part is a short recollection of Dr Montessori's premises considering the structure and development of human mind, as well as the mutual relations between Absorbent Mind, mindreading abilities and the process of becoming conscious observer of one's own mental activity. Second part of the article describes the results of the author's research on children's ability to understand and explain their own minds. The pilot study was designed to compare the meta-cognitive knowledge of children educated in different pedagogical systems: Montessori school and traditional public school in Lublin. Comparative analysis of children's interviews and drawings enabled to discover some characteristic regularities and differences between these groups. The last section of the paper includes the interpretation and discussion, as well as the

[1] Some parts of this article were presented at the conference "Maria Montessori pedagogy in Poland and in the world" in Krakow, September 2008. All correspondence should be mailed to: dzdybel@gmail.com

attempt to identify those elements of school environment that seem to be directly responsible for supporting the development of children's ability to observe and understand their own mind activity.

Montessori's concept of mind and cognition

The central element of the Maria Montessori's theory of human development is the conviction that the structure and functioning of a little child's mind differ significantly from those of an adult. A child's mind cannot be treated as a simple miniature of an adult's one, child is not born with "little" knowledge about the world, "little" memory or "weak" will. All these mental forces has to be built or rather created in child from the very beginning (Montessori 1992). This amazing process of constructing himself and his own mental forces is not the result of conscious intention however, like the mature learning of adults. In Montessori own words: „We adults know what we want. If we desire to learn something, we set ourselves to learn it consciously. But the sense of willing does not exist in the child: both knowledge and will have to be created. If we call our adult mentality conscious, then we must call the child's unconscious, but the unconscious kind is not necessarily inferior. An unconscious mind can be most intelligent" (1992, s. 22). This type of intelligence can be found everywhere in nature – it steers the actions of all species, allowing them to survive – this type of intelligence is maybe unconscious, but sensible and reasonable. This extraordinary, inborn strength of a child's psyche given by the nature to direct the process of learning, while other skills are not available yet, was called by M. Montessori an *Absorbent Mind* (1992, s. 24). It was defined as an intense and specialised sensitiveness which drives the child to incorporate all the impressions and experiences coming from his surroundings. Its extraordinary power enables us to remember everything that we come across in life, although not everything is available for rational reflection. Thanks to that "unconscious intelligence" a child absorbs and assimilates the impressions from the surrounding world, without much effort, or even without the knowledge and will of doing that. The sensations are then registered in the psyche, transforming the mind and forming its basic dispositions: thinking, memory, attention and will. Adults, as opposed to children, are merely the recipients: „impressions pour into us and we store them in our minds, but we ourselves remain apart from them, just as a vase keeps separate from the water it contains. Instead, the child undergoes a transformation. Impressions do not merely enter his mind, they form it" (Montessori 1992, s. 24).

The work of *Absorbent Mind* was somehow metaphorically compared by M. Montessori to a photographic plate, which immediately and effortlessly records in details everything that comes into the range of the lens. "Like a photograph is taken in darkness; and then – still in darkness – undergoes a process of development. Then, still in darkness, it is fixed. Finally, it is brought up to the light, where it remains fixed and unalterable. So too with the absorbent mind; it begins deep down in the darkness of the subconscious; it is developed and 'fixed' there; and finally emerges into consciousness, where it remains a fixed and permanent possession" (Standing 1962, s. 110-111). This natural process of growing and maturing cannot be accelerated in any artificial way. As turning on a light too soon can lead to overexposure of the photographic plate, too early or overly aggressive attempts to "enlighten" a small mind can only harm it.

Human mind structure, according to Montessori, is divided into three parts (see: Chattin-McNichols 1992, s. 40-41). The largest and the most important part is the unconscious

level, the location of such inborn instincts, as *mneme*, *horme* or sensitive periods. The next part is the subconscious level, which is the storage for memory traces of all sensory experiences (engrams). These traces, although not always directly available for human memory, are constantly active, being processed and organised, allowing for the creation of new ideas. Its existence is proved for example by the instances of resolving problems during sleep, when the conscious part of our mind is "off". The conviction of the role of the unconscious mind in learning underlay the famous idea of "indirect preparation" in Montessori pedagogy. Montessori believed that working with sensorial materials is more beneficial for a child than doing tests. Manipulating with the material a child collects sensations, which are stored in its memory until the brain is ready to master the new function and transfer it to the conscious level. This idea of unconscious absorption has been immanently included in the structure of many developmental materials (Montessori 1972, s. 99-106).

The smallest part of our mind is the conscious one. It develops only around the third year of life and gradually takes over the responsibility for the learning processes. But, as Montessori says, there is a high price to be paid for this great developmental achievement, acquiring the ability to plan and monitor one's own mental activity means that since now on "every fresh piece of knowledge costs us effort and hard work" (Montessori 1992, s. 24) - conscious learning resembles tiresome, manual preparation of a drawing rather than taking a photograph (see: Standing 1962, s. 110).

Thus, a child's psychological development goes from the phase of unconscious creation and construction of his own "mental muscles" (Montessori 1992, s. 24) to conscious exercising of those muscles to achieve the level of perfection and precision. In this meaning, the awareness of oneself and one's mental capabilities is the great aim of child's development, and the road to achieve it, at the same time. It is then worth posing the question – what are the metacognitive consequences of Montessori education in practice? Are Montessori children aware of their own mind? How do they understand and explain the functioning of their minds in the process of learning? Do students educated in various educational systems differ from one another in this regard? To answer such questions the pilot study was designed.

Materials and method

Subjects

The research was conducted in public primary school in Lublin. The school consist of two parts: the older, traditional part working on the basis of national curriculum provided by Polish Ministry of Education; and the Montessori part, established in 1992 with a significant help of Hogeschool Gelderland in Arnhem. The basic equipment for all three levels of school were founded by EU, as well as the 2-years training for selected group of teachers. Those two branches of the school are situated in separate parts of the building, but they share playing ground and administrative part of management. The recruitment for Montessori classes is based on parent's choice and is free of charge, like the whole public system of education in Poland.

The group of 120 children was recruited: 60 from Montessori classes and 60 from traditional one. The attempt was made to keep the compared groups balanced in terms of such independent variables as: the age and sex of children, their family situation (socio-cultural status) and the previous preschool experience. Each of the compared groups was

in half composed of 7-year olds and 8-year olds. In the Montessori divisions there were more boys (51.7% compared to 45% in the traditional classes). All participants attended preschool, although in a different scope. The length of the preschool education of Montessori children was noticeably greater, possibly due to the recruitment system – for the second level of Montessori school priority is given to those children who have completed Montessori kindergarten and already know that method. Detailed information about previous kindergarten experience of all children participating in the study are presented below.

Table 1 - *Preschool experience of children in compared groups*

Group	The lenght of preschool experience			
	1 year	**2 years**	**3 years**	**4 years**
	%	%	%	%
Montessori	0,0	11,7	25,0	63,3
Traditional	31,7	25,0	10,0	33,3

Procedure[2]

A projective drawing followed by an interview has been used as a main method of collecting data. Children were asked to draw their own mind and explain how is it built, and how it works when they learn something new or deal with a very difficult problem. The explanations were recorded, and then the transcriptions were analysed in terms of their content.

The choice of method was based on widely recognised distinction between objective and subjective part of human knowledge. In objective terms, knowledge is a common value, the result of historical and cultural achievements of societies, objectified and ordered, stored in the content of textbooks, and transmitted from generation to generation. At the subjective level, on the other hand, knowledge is "the content of the mind of a specific individual" (Szewczuk 1985, p. 343), dynamic and changing, constructed and reconstructed in the course of everyday personal experiences, negotiated and renegotiated during interactions with other participants of social situations (Klus-Stańska 2002, p. 104). The first form of knowledge, due to its source and criteria of verification, corresponds to the so-called scientific knowledge. The second one is sometimes called in psychology "naive" knowledge ("primitive" or "private"). The study presented here, while trying to reach what 7-8 years olds know about their own mind's structure, is the attempt to reach the "naive" level of their knowledge, the one which is difficult to measure and describe, and sometimes even impossible to be grasped by its "owner" (as it is hidden, e.g. in activity procedures). Obviously, small children do not have any scientific psychological knowledge about mental structures, but they are "naive psychologists", being naturally driven to understand what is going on in human mind. This area of child's experience could be called intuition or premonition, going beyond the

[2] The research presented here should be treated a pilot study or an inspiration for further, more elaborated and specified effort. One reason is the fact that all the children recruited to the study came from only one Montessori school in Lublin. Another reason is that not all parents agreed to reveal the information about their education and profession. As a result, the compared groups of children were not equally balanced in terms of their families' socio-cultural status. The empirical data presented here were collected by Aneta Dąbek for MA thesis (2008).

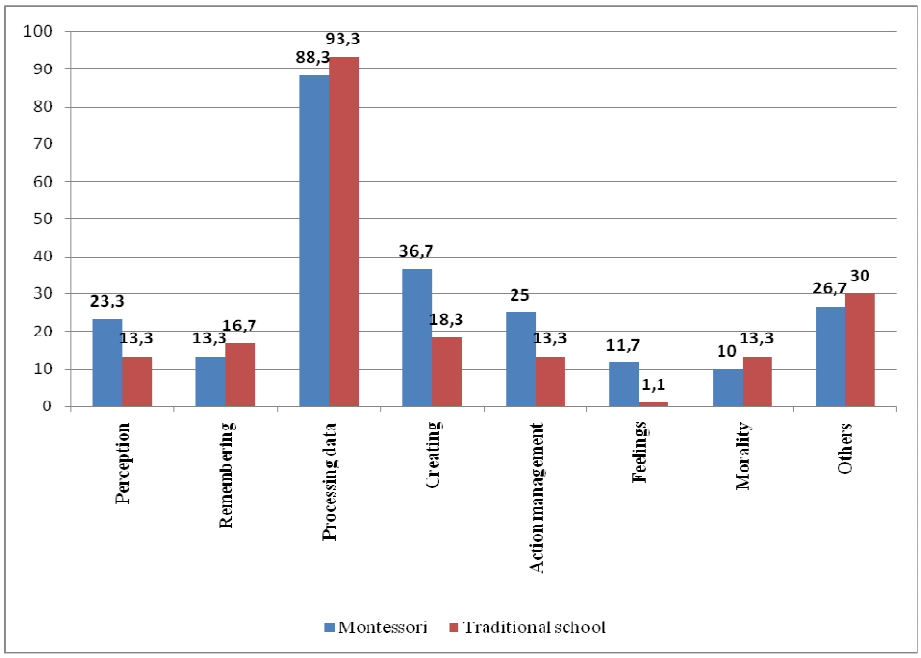
child's capability to express himself in words, escaping verbal description. Two main obstacles exist for constructing mental representation of human mind activity: one is the lack of professional, psychological vocabulary, the second one is a difficulty to get a direct insight into one's own mental activity. It rarely happens that a human being, no matter a child or an adult, is able to think and observe one's own process of thinking, simultaneously. At least first of those obstacles should be avoided by using a method presented here. A drawing fulfilled a special role in the research: first of all, it was supposed to encourage the child to reflect on the subject; secondly, its task was to enable the child to express nonverbally what would be difficult to verbalise. This kind of "intersemiotic transcription", offering means or symbols much closer to child's nature than words (such as colours, shapes, gestures etc.) is often used with small children as an effective way of psychological research.

The content analysis of children's statements resulted in the selection of 7 basic types of human minds' functions that, according to participants, can be fulfilled in the process of learning. These are:

- sensory perception - collecting data from the external environment through senses;
- memory - remembering information, storing it in a logically ordered way and reproducing when needed;
- processing information - analysing, establishing simple and complex relations between them, drawing conclusions, inferring, valuating ideas, solving problems, setting hypothesis etc;
- creating new ideas and inventions;
- managing actions - making decisions, planning, directing the movements of the body, etc. (human mind as a command centre);
- experiencing feelings and emotions;
- managing the sphere of morality – setting social principles, distinguishing between good and bad, specifying and referring to moral standards, evaluating behaviour, etc.

Chart 1 presents the results of content analysis of children's explanations recorded during interview.

Chart 1 - *Functions of mind named by children during interview (numbers exceed 100% because a child could list several different functions of human mind)*



It is easy to notice that more than 80% of children in both groups intuitively perceive human mind as a center of processing data. But at the same time several striking differences between the compared groups can be found. Four important dimensions of the human mind occurred significantly more often in Montessorians' statements. These are:

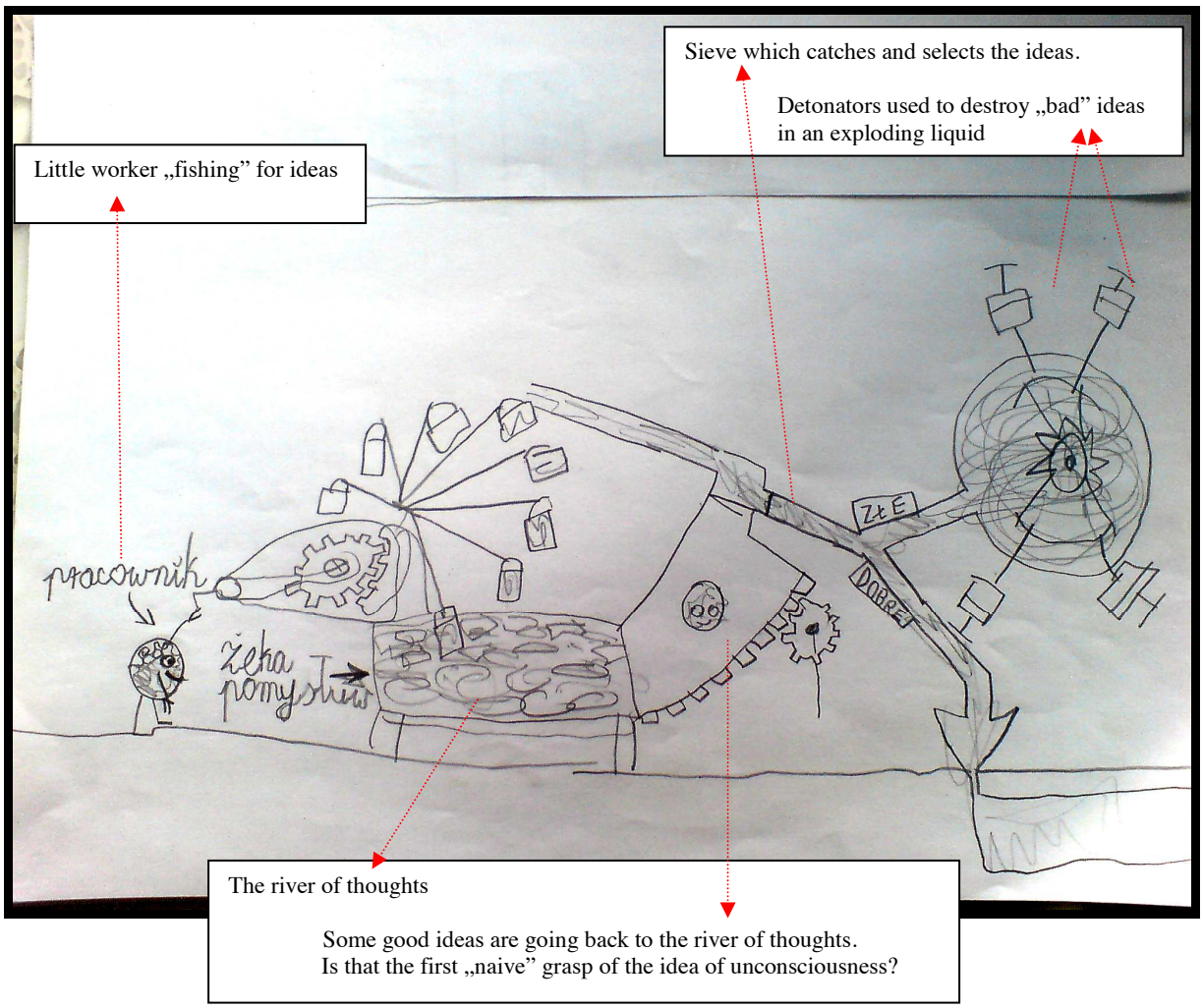
- creative capabilities of one's own mind – mentioned by more than 36% of Montessori pupils, as compared to only 18% of pupils from traditional classes, e.g. *"mind is like a bus stop for a good idea", "mind is a device for inventing new things, discovering new ideas", "mind id producing words and thoughts, the word is leaving the mind, it goes to your mouth and you are speaking"*;
- the role of mind in managing and directing human actions, that is, planning, and making decisions, e.g. "our mind tells us what to do", *"mind is giving orders like a president", "mind is something to steer your body movement, your whole knowledge is contained there"*;
- the role of sensory perception – almost a ¼ of Montessori pupils believe that their mind cannot function without the senses (as compared to 13% in traditional classes), e.g. *"mind is connected with eyes, you can see something in your mind and remember that in your thoughts*";
- emotional experiences – 1/10 of the Montessori pupils link functioning of the mind with feelings, e.g. *"some minds are jolly, others are sad"*.

On the other hand, children educated in a traditional system indicated more often the role of the mind in the processes of remembering information and referring to moral standards (their specification and observance), e.g. *"mind is a thing where different memoirs are stored", "without our mind we would be very bad creatures"*.

To illustrate the procedure of collecting data, few drawings' examples will be presented below, together with large fragments of interviews with children. First example is the drawing of 7 years old boy attending Montessori school.

When explaining his drawing the boy says:
"Mind is an organ which thinks. Without eyes it would be difficult to think, because one looks at something and then can imagine that. Mind can also invent different things. For the mind to think one has to have hands, because you touch something and your body remembers that this, for example is cold. One can also reminisce – mind is such a drawer for different events, because we can remember them. (…) Countless possibilities of ideas, for example night dreams are thoughts mixed together with truth, because there is a seed of truth in every dream… This little man here is fishing for ideas, the ideas are flying through that pipe and then the sieve is separating good ideas from bad ones, and the serrated circle is shaking the sieve off. When only bad ideas are left, they are going to the liquid and are exploding there. Good ideas are flying to the brain.(…) Mind thinks: here we have facts, for example when your parent tells you 'this is a cattle', you will know when doing a crossword what is a cattle. With riddles we think a bit differently – we put all the facts together and then we add our own ideas… Mind is constantly trying to change something within his imagination, it wants to look at the world in a different way…"

Example 1 - *Seven years old boy from Montessori school*
(joined Montessori school at 4, middle class family)

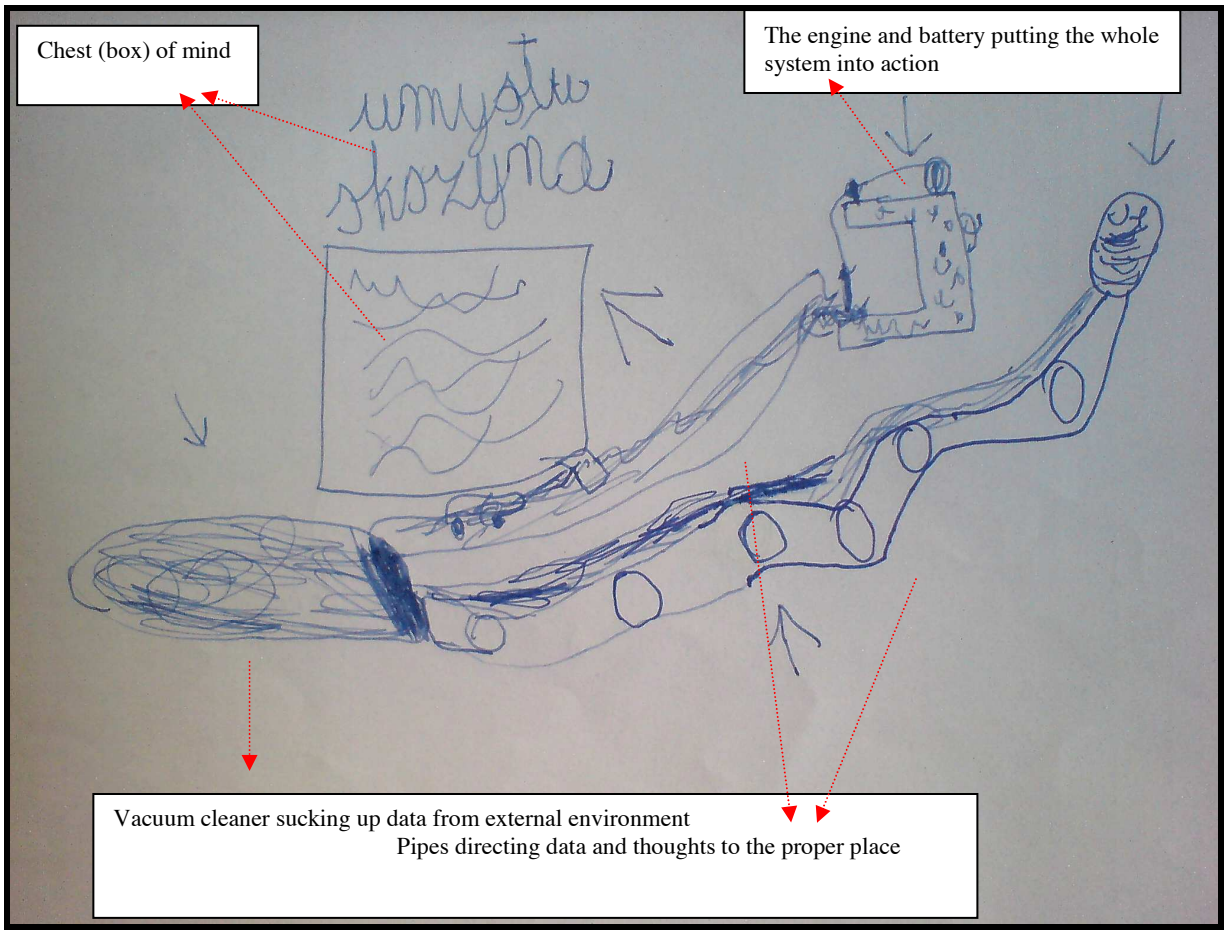


Is it not a wonderful drawing?! Though it was created by a little, "naive" psychologist, it could be used in any serious, professional academic textbook of cognitive psychology. This drawing includes everything what is necessary in psychological model of processing data – this mind is able to collect the data from environment, store them in memory, give them a proper order by putting each piece to a particular "drawer". This mind is able to create new ideas and even improve itself! A close look at the picture presented above, would raise however some additional important questions. Why "*bad ideas are exploding*"? The boy does not explain that in details – perhaps because usually bad ideas cross our mind suddenly, unexpectedly, as a kind of strong impulse compelling us to do something wrong or stupid? Or maybe simply because they need to be destroyed? Why not all the good ideas are caught by the sieve? Some of them are going through the sieve's holes and are driven back to the "river of thoughts". Why? Again, the author does not explain that, but we can try to guess. Maybe because they are not fully shaped, not crystallized enough to reveal themselves, too weak to reach the awareness, or maybe because they are just not needed at the moment? It is hard to resist the impression that

this part of the drawing reveals small boy's intuitive recognition of unconscious part of human mind.

To compare another drawing is presented below, together with the description provided by 7 years old boy from traditional school (the boy has similar preschool experience and family status).

Example 2 - *Seven years old boy from traditional public school*
(2 years of traditional preschool experience, middle class family)

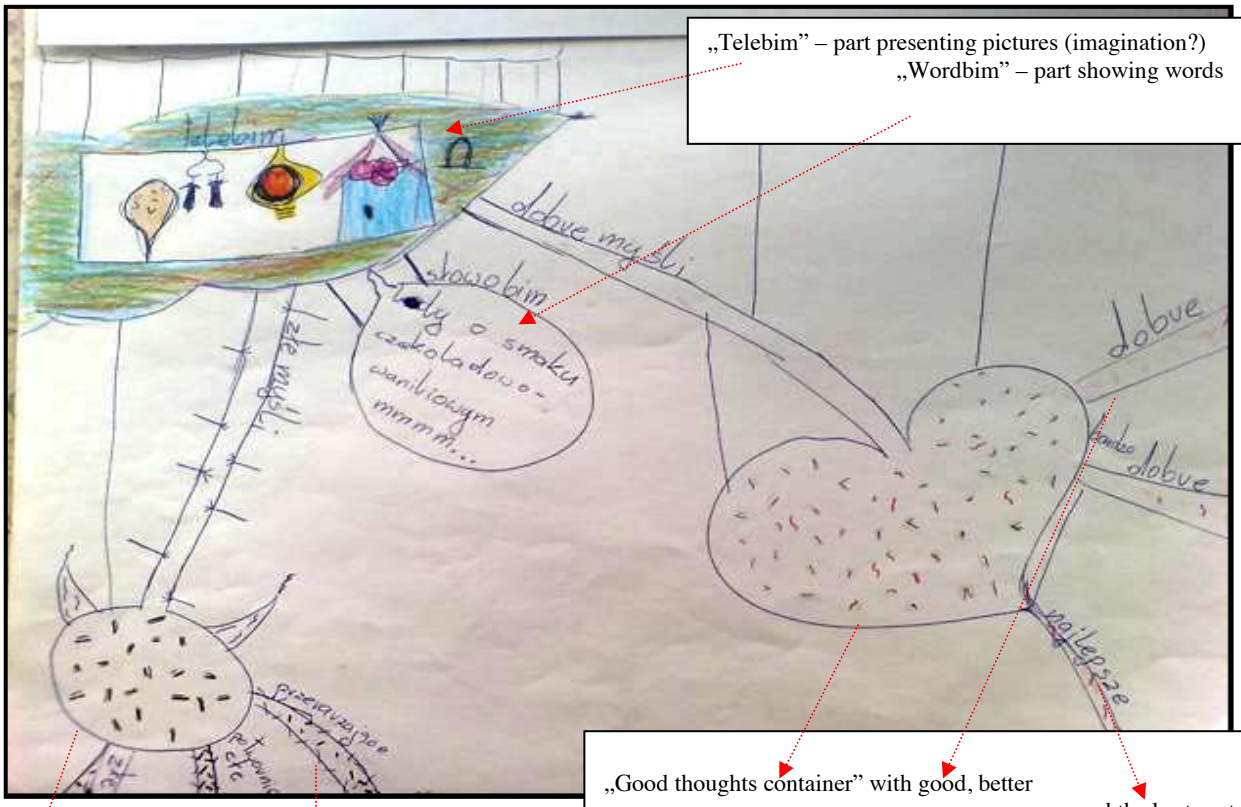


To describe his drawing the boy explained: *„Mind is something… hmm…we can find out from him where something is, to be able to answer the question correctly later… Here we have the chest of mind and pipes – here the idea is going through, and then it is taken to the vacuum cleaner and then to this chest…. When we are reading our mind is working and the letters are showing up inside it. When I have a very difficult task, I can sit for a while I think…"*. As we can see, the mind structure presented at the drawing is quite complicated. It consists of at least four elements: 1/ "the vacuum cleaner" responsible for collecting, or rather sucking up data from external world; 2/ the engine setting the whole system into action; 3/ pipes and wires transporting the data and 4/ the chest of mind, quite mysterious because we don't know anything neither about the structure of it, nor about the way of producing ideas. The whole system resembles the classical model of processing data. Unfortunately the boy is not able to express himself and provide the

thorough description, we are guessing more from the picture than we hear from the author. The lack of words and poor syntactic structures are clear evidences of restricted language code, being at the same time a huge obstacle in expressing oneself and explaining the meanings represented in the picture.

Next example is again Montessori child, 8 years old girl, attending Montessori system since being 4.

Example 3 - *Eight years old girl form Montessori school*
(attending Montessori preschool since being 4 y.o., middle class family)



„Telebim" – part presenting pictures (imagination?)
„Wordbim" – part showing words

„Good thoughts container" with good, better and the best part

„Bad thoughts container"

„scaring thoughts" part

The explanation provided by the girl: *"Mind is something… it is where the thoughts are collected, from there we can take new ideas, new thoughts that we want to say. This is a kind of device in our head which is thinking… (…) There is such a "telebim" there, which is showing thoughts and pictures. Good thoughts are going to a 'good thoughts container', bad ideas are collected in 'bad thoughts container'… When I am jolly, bad thoughts are not working. Without our mind we cannot function".*

Again, we can observe a very characteristic phenomenon: this drawing includes much richer meanings and intentions, than the verbal explanation provided by the child. According to the girl, mind is a breeding ground for good and bad thoughts, the structure responsible not only for collecting information, but also for analyzing them, that is for selecting and evaluating thoroughly each piece of information to store it in a proper place. At least 6 different element are composing the mind structure presented at the picture

(some of them being creatively named by the little author): 1/ “telebim”, which is a special screen for showing pictures (this part resembles imagination); 2/ then we have “wordbim” which is a special screen showing words and sentences; 3/ “good thoughts container”, similar in shape to human heart and presented in nice, bright colours. What is interesting, is the fact that this container was additionally divided into good, better and the best part. By analogy there is also “bad thoughts container” (4), again divided into three parts: “bad”, “extremely bad” and “scaring thoughts”. Careful observer should also notice that this container is rough in terms of both, dark and unpleasant colours but also prickly surface, as if it was covered with a barbed wire! The last element of this mind-system - pipes or roads (5) to containers seem to reflect the character of data transported via them: the road to “good thoughts container” is smooth and easy, the one guiding to “bad thoughts container” is barbed, ugly and painful.

Discussion and conclusions

One striking observation is that the studied groups of children differ not in the level of drawings complexity reflecting the intricacy of children’s mental representations, but in the ability to describe the drawn mechanism with words (that is, the ability to verbalise their knowledge about the mind, which is the core of metacognitive awareness). Montessori children’s knowledge about their own mind seems to be transformed faster and easier from the intuitive to the conscious level, from the operational (or contextual) to the declarative form. It is worth considering then, what characteristics of prepared environment do stimulate that area of a child’s cognitive abilities? Which elements of Montessori pedagogy promote the development of metacognitive awareness in a particularly important way?

The developmental significance seems to be attributed to three basic elements:

- **Activity routines –** understood as a certain order or sequence of logically structured activities, which are based on simple, but effective cognitive strategies. Some of these sequences underlie the construction of developmental materials, others appear as patterns of behaviour presented by the teacher, and then imitated, repeated and consequently mastered by children. One of such action sequences is the process of task performance, leading from the independent specification of a goal, through the planning of subsequent activities, to the responsibility for completing the task. Therefore, the process of development leads from 1/ the perception of sequences of elements in the material, through 2/ exercising of the sequences of physical actions, to 3/ the grasping of the sequence of cognitive, mental activities, performed habitually without additional support in materials. The unconscious repetition is only the departure point for that journey, the arrival point being the achievement of good, conscious habits of mental work, which could be employed in any out-of-school activities. Montessori teachers serves as a model of those habits.

- The second important element of prepared environment is **the discipline of cognitive activity** – which is the consequence of achieving a high concentration on the task. For Dr Montessori “the internal discipline means also the discipline of mind” (see: Stoll Lillard 2007, s. 309). To achieve that internal discipline a child needs to acquire some basic level of self-awareness – the awareness of his own knowledge and capabilities. If a “little explorer” from the second level is to become a “young scientist” in the future he needs to recognise and understand not only the external world of fauna and

flora, but also the rules of his own internal, mental world. The discipline of cognitive actions is promoted especially by the order and structure of prepared environment, to be exact – by a particular combination of freedom at the macro level and precision of activity at the micro level – the combination which is unique for Montessori method (Stoll Lillard 2007, s.324). At the macro level, that is, the general daily schedule, the Montessori school is full of freedom of choice: there is no detailed lesson plan, no compulsion to do as the teacher says at a given moment. All this may seem even chaotic for an inexperienced guest. However, at the micro level the Montessori prepared environment is precisely structured: the materials are selected to support the transition from the concrete level of to the abstract, the programme hidden in the materials is consistent, consequent and structured, there are detailed rules of using every material – work procedures, which support the development of certain neuronal networks in the brain, preparing the child's cognitive skills to be used in other situations. It is this cognitive discipline and order contained in the micro-routines that gives a numerously repeated pattern of a full work cycle a chance to be quickly internalised.

- The third factor, essential for metacognitive development of any individual is **opportunity to verbalise one's own knowledge –** naturally and frequently occurring in mixed-age groups, where an older and more competent friend can explain the task to a younger child, and be his tutor. The ability to give a proper verbal instruction or explanation to others requires from the child not only to become aware of one's own knowledge, but also to realize and monitor the direction of cognitive activities, necessary to perform a particular task. In this way a child goes from 1/ expressing his knowledge in words (What do I know? What do I not know about the task?), 2/ through the verbalisation of instruction (What needs to be done in the task and how?), to 3/ the naming of cognitive actions performed and 4/ drawing conclusions (Why it has to be done this particular way? What should be the conclusion?). The child thus learns not only the responsibility for himself and for the results of his own learning. He also has a chance to experience the opportunity and consequences of undertaking the responsibility for others. Helping others in performing their mental tasks serves here as a train to developmental journey.

- The key moment in such tutoring activity, from metacognitive point of view, is a misunderstanding – the situation when the instruction was not understood correctly and the task needs to be explained again. Now, the young tutor has to find another words to express the same meaning. Struggle with such problem is not simply linguistic task, it rather deep, mental work of reconstructing one's own knowledge, reorganising the material or situation presented. And sometimes this work has to be done over and over again, until the young colleague will say: "Ok, now I get it!" Experiencing situations like that would finally result in becoming aware of one's own thinking. The atmosphere of social interactions and cooperation in mixed-age groups, so typical for Montessori classrooms is naturally supporting this kind of awareness and precision of child's mental activity.

To summarise, Montessori method is not only the systematic anthropological concept of a human being, not only a consistent theory of human psychological development, but also a unique "mental culture" of a classroom. The core of that culture is created on one hand by principles and values guiding the child's work, and on the other hand by teachers'

beliefs and convictions about the child's mind, especially those hidden convictions, sometimes not fully conscious, but celebrated in everyday actions and rituals. The child, immersed in so carefully designed and ordered reality, grows into the mental culture of prepared environment, gradually constructs his own mental abilities, by imitating and reproducing the cognitive strategies offered by his teacher. In such terms, some of the contemporary psychologists propose to consider the metacognitive development of a child not as an individual achievement, but rather as a process of gradual entering into a "community of minds" in which people exchange ideas and memories, formulate plans and construct common meanings (Astington 2006, s. 182). Indeed, in such terms Montessori classroom seems to offer a perfect cultural background.

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3. Some additional news

3.1. New Italian Edition of Maria Montessori's "From Childhood to Adolescence".

A new edition of Maria Montessori's book "From childhood to adolescence" has been published in Italy by FrancoAngeli. The publication was edited by the Centre for Montessori Studies with an introduction and notes by Clara Tornar and translation from the French by Monica Salassa.

3.2. Rome Seminar "From Childhood to Adolescence with the Pedagogy of Maria Montessori"

The Centre for Montessori studies is going to organize on next November 27th a Montessori Seminar which will be hold at the Main Hall, Rectorate, University of Roma Tre. The Seminar will focus on the topicality of Maria Montessori's thinking about the pre-adolescence and adolescence psychological and educational problems. The Seminar program will be available visiting the Centre for Montessori Studies website at <http://www.montessori.uniroma3.it>.

NOTE:
This NEWSLETTER was composed by Prof. Clara Tornar (University of Roma Tre) and Monica Salassa, assistant of the Centre for Montessori Studies (University of Roma Tre).