

Maria Montessori's Philosophy of Experimental Psychology: DRAFT

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Maria Montessori's Philosophy of Experimental Psychology

Abstract:

Through philosophical analysis of Montessori's critiques of psychology, I aim to show the enduring relevance of those critiques. Maria Montessori sees experimental psychology as fundamental to philosophy and pedagogy, but she objects to the experimental psychology of her day in four ways: as disconnected from practice, as myopic, as based excessively on methods from physical sciences, and – most fundamentally – as offering detailed examinations of human beings (particularly children) under abnormal conditions. In place of these prevailing norms, Montessori suggests a model of the teacher-scientist in a specially prepared environment, who can engage in sustained and impassioned observation of “normalized” children. Drawing from a variety of texts and recently published lectures, this article lays out Montessori's philosophy of experimental psychology and briefly discusses its relevance today.

In 1901, a young Italian, who had already made a name as the first woman physician to graduate in medicine from the University of Rome¹ and who had begun to pursue what would

¹ See Montessori 1997: 259, where Montessori describes herself in this way. Her early biographer Anna Maria Maccheroni (1947) claimed that she was the first woman to graduate from medical school in Italy. Recent studies

become her life-long vocation of working with children, left her position as a psychiatrist and physician to enter the University of Rome as a PhD student in philosophy, in order, as she put it, to “undertake the study of normal pedagogy and of the principles on which it was based” (Montessori 1912: 33). As a medical student, she had already studied under one of the foundational figures in the birth of Italian psychology, Giuseppe Sergi, whose “anthropological” approach to the study of human psychology emphasized the reduction of mental phenomena to physiological features and the careful measurement and classification of human beings (see Cimino and Foschi 2012). In the context of her philosophical studies, she operated at the intersection of several competing philosophical, social, and political trends.

The dominant properly *philosophical* voice at Rome was that of Antonio Labriola, from whom Montessori studied theoretical philosophy (see Trabalzini 2011:39) and who taught a broadly Hegelian Idealism like that which would go on, through its appropriation by Gentile and then Croce, to dominate the Italian philosophical scene for much of the 20th century.² Against this idealist strain, Sergi and Sante De Sanctis³ advocated a “positivism” – informed by thinkers

have called both claims into question, showing that other women graduated medical school in Italy as early as 1877 (see Foschi 2012:29; Trabalzini 2011:9-10, 14) and that there was even a prior female graduate from the University of Rome (see Trabalzini 2011:14). Still, her *reputation* as the first female physician in Italy helped pave the way for her later popular appeal.

² Labriola’s own appropriation of this Hegelianism went in a more Marxist direction, but a full discussion of the relationship between Labriola and later appropriations of Idealism in Italy is unnecessary for the purposes of this paper.

³ DeSanctis helped articulate a distinctive sphere for psychology as a science and established (with Montessori’s collaboration) some of the first properly psychological (as opposed to phrenological or anthropological) tests of intellectual deficiency. For more details on his important role in the development of Italian psychology, see Cicciola

such as Humboldt and Wolff – that sought to study human beings through rigorous human sciences built on an experimental model. As Montessori described her “master” and “former teacher”:

Sergi ... defended with the ardor of a prophet the new scientific principle of studying the pupils in our schools by methods prescribed by anthropology. Like the scientists who preceded him, he was thus led to substitute ... the human individual taken from actual life, in place of general principles or abstract philosophical ideas. (Montessori 1913: viii, 14)

At the same time, Italy was engaged in a rapprochement with (American) pragmatism, especially William James (see James 1906; Santucci 1963); and more generally, elites in Italy increasingly sought a fusion of science and practical-liberal reforms (see e.g. Foschi 2008, 2012; Cicciola et. al. 2013).

Unsurprisingly given her medical background, Montessori most impressed the positivists and quickly became a protégé of Giuseppe Sergi and De Sanctis. But while she has often been described as “a scientist swept up in the wave of logical positivism” (Lillard 2005: 340; see too Gould 1996:139) and is rightly said to “owe much to the tradition of positivist anthropology” (Cimino and Foschi 2012:327), Montessori is also influenced from the start by a wide variety of social and intellectual influences and willingly “engaged with various aspects of positivism, theosophy, Catholicism, and also liberalism and fascism ... to be able to promote modernization in education” (Foschi 2012:14-15). In particular, she “adopted a critical stance with respect to positivism; in fact she wanted to construct a new psychology of education that aimed to respect the children’s personality and developmental potential” (ibid. 24). The result of this critical and

et. al. 2013; Cimino and Lombardo 2004; Foschi 2012. For Montessori’s relations to DeSantis, see Cimino and Foschi 2012; Foschi 2012; and Tralbalzini 2011.

progressive stance is a nuanced view about the nature of science in general and the special sciences of experimental psychology and biology in particular. As Montessori critiques the most extreme versions of positivism, she develops her own philosophical perspective.

There has been limited, but increasing, attention to the social, political, and cultural influences on Montessori's development. In English, Rita Kramer's important biography of Montessori (1975) is a hallmark of this interest, and recent studies by Italian scholars have considerably raised the level of analysis of Montessori's work and development, drawing attention to the role of her feminist activism (see especially Babini 2000 and Babini and Lama 2000) and her relationships with fascism (Lama 2002; Moretti 2011), Catholicism (Bazin 2011; Cohen 1969; Foschi 2008), and theosophy (Wilson 1985). More general studies of her development as a whole (Foschi 2012; Schwegman 1999) or of the development of her thought in relation to particular works (Cives 2000; Moretti 2011; Tralozzini 2003; 2011) further enrich our understanding of how social and cultural forces shaped her thought. Throughout these studies, however, the general approach has been dominated by what Moretti (following Cives 2000) has called "an approach that underlines [Montessori's] work in relation to its historical-cultural context" (Moretti 2011) or what Foschi has described as a "'multiple science' ... that came out of the laboratory into the world" (Foschi 2008:252; see too Foschi 2012:24). Without denying the importance of those social and cultural factors, the focus of this essay is different. Through philosophical analysis of Montessori's critiques of psychology as they emerge in her writings and lectures, I aim to show how her critiques of experimental psychology were *philosophically* respectable, both then and now.

Despite her philosophical training, and despite having written books that lay out a developing and insightful philosophical system, Montessori is not recognized today as a

philosopher. Part of the reason for this is likely due to her place as a female thinker in a context (early 20th century in general, and Italy in particular) that did not accord serious respect to women as philosophers.⁴ Part of the reason, too, is no doubt due to the fact that her philosophy is infused – like that of William James or Freud – with empirical and psychological work. Much of the reason, I suspect, is that Montessori, early in her career, focused her energies on developing the pedagogical movement that now bears her name (cf. Cohen 1969; Kramer 1975). She left her professorship to run teacher training courses, develop her pedagogical theories, and promote her ideas about the nature and dignity of children. One result was that she did not systematically engage with leading philosophers of her day on general philosophical topics in the newly emerging journals and presses of philosophy. Her work, even when deeply engaged in problems of epistemology or metaphysics, was published under the rubric of education or pedagogy and presented primarily to those interested in young children. As David Archard and Colin MacLeod have aptly observed, “Children have not been the subject of any extended philosophical discussion until recent years” (Archard and MacLeod 2002:1), and even discussions of children offered by major philosophers – most notably Rousseau’s *Emile* – are interpreted in ways that downplay any *actual* connection to children’s lives (e.g. Plamenatz 1974; Hanley 2012). Philosophy has been practiced by and for (male) adults, and children’s possible contributions have been, even more than women’s, wholly marginalized. As an Italian woman trying to develop a philosophy from and for children, Montessori has been relegated to scholarly invisibility amongst philosophers.

⁴ See Babini 2000 for discussion of Montessori’s feminism as well as an insightful discussion of the question “Why has no one in Italy [as of 2000] thought to write an intellectual biography of Maria Montessori?” (2000:46).

In this paper, I begin a revival (or, better, *en-vival*) of philosophical attention to Montessori by discussing her explicit critiques of the empirical psychological methods of her day and her articulation of a new approach to experimental psychology. This study marks an important episode in the history of psychology. Although her contributions were (and are) largely ignored by mainstream psychologists, Montessori anticipates many later developments in developmental psychology (see Lillard 2005; Foschi 2012:128-47), and her claims about children's development have been (and are being) put into practice in thousands of schools educating millions of children throughout the world. But Montessori's reflections on experimental psychology are also particularly timely in the contemporary *philosophical* context. The rapprochement between philosophy and psychology is intensifying, as testified by recent and quite disparate work by Joshua Greene (2007, 2013), John Doris (2002), Antony Appiah (2008), Michael Bishop and J. D. Trout (2005), and others that all, in various ways, use experimental-psychological findings to justify philosophical conclusions. The philosophical issue of the status of psychology as a science and as an appropriate means of studying the human condition continues to be widely debated. In this paper, I outline several key Montessori critiques of the experimental psychology of her day that are of continuing relevance today and sketch her positive (and still relevant) alternative approach.

1. The importance of experimental psychology.

For Montessori, philosophy must be empirically adequate. She approvingly describes her mentor Sergi, who “substitute[d] ... the human individual taken from actual life, in place of ... abstract philosophical ideas” (Montessori 1913: 14), and she rhetorically asks, about the particular context of pedagogy, “how could we conceive of the content of pedagogic

anthropology otherwise than as something to be derived by the experimental method...?”

(Montessori 1913: 28). Later, describing her work on the first “Children’s House,” she explains the scientific function of this institution:

As soon as I knew that I had at my disposal a class of little children, it was my wish to make of this school a field for scientific experimental pedagogy and child psychology ... My intention was to keep in touch with the researches of others, but to make myself independent of them, proceeding to my work without preconceptions of any kind. I retained as the only essential, the affirmation, or, rather, the definition of Wundt, that ‘all methods of experimental psychology may be reduced to one, namely, carefully recorded observation of the subject.’ (Montessori 1912: 72-3, Montessori 1967: 41)

Later writings reiterate and deepen this emphasis on empirical bases for pedagogical practices, both in general – “The contribution I have made to the education of children tends ... to specify by means of revelations *due to experiment*, the form of liberty in internal development”

(Montessori 1991: 55, emphasis shifted) – and with respect to each particular material or practice used in her classrooms – “Those external means already alluded to several times ... must have been already *established by experience*” (Montessori 1991: 66, emphasis original; see too Montessori 1997: 31; Montessori 1995: 223).

Even while insisting on the importance of experience, observation, and experiment, however, Montessori was consistently critical of existing approaches to child psychology from her earliest days up until her death in 1952. Among her earliest publications are critiques of Lombroso’s anthropology (e.g. Montessori 1903); and in lectures in 1913, she emphasized that “I am not convinced of the value of psychological examinations taught by the modern dictates” (Montessori 2013: 44). In *The Montessori Method* (published in Italian in 1909 and translated

into English in 1912), she “started with a view in which Wundt concurs; namely, that child psychology does not exist” (Montessori 1912: 72) and the revised edition of this work in 1948 retains this passage and adds that “others had more or less confused child studies with education” (Montessori 1967: 41).⁵ In *The Secret of Childhood* (1936), Montessori insists that “child psychology is ... something that must be *radically revised*” (Montessori 1996: 105), partly because “[t]he child has a psychic life of which the delicate manifestations pass unperceived ... [so only] the outward aspect he thus presents has been considered in the study of child psychology” (Montessori 1996: 105). The physiological anthropology and later behaviorism dominant in the first part of the 20th century were important focuses of her critiques. But while noting the confluence of her interest in inner life with Freud’s psychoanalysis, she is equally critical of Freud, whose “theories have proved inadequate” (Montessori 1996: 5; cf. Foschi 2012:129). For Montessori, the child “must be observed rather than analysed, but observed from a psychic standpoint ... [T]his approach will lead us away from psycho-analytic theories and technique into a new field of observation of the child” (Montessori 1996: 7). And Montessori has specific and pointed critiques of other empirical psychologists of her day, from the more theoretical William James (e.g. Montessori 1996: 59-60, Montessori 1991: 120-121) to more experimental methods of De Sanctis, Binet and Simon (e.g. Montessori 1912: 173; Montessori 1991: 86-7) and anthropological methods of Lombroso and Sergi (see Montessori 1899 and 1903).⁶

⁵ For a detailed study of changes in the various editions of this work, see Trabalzini 2011.

⁶ Particularly with respect to her critiques of Lombroso and Sergi, both of whom used anthropological pseudo-science to argue for the inferiority of women, there are important connections between Montessori’s philosophy of science and her feminism. For discussion, see especially Babini 2000 and Babini and Lama 2000.

Four related criticisms of alternative approaches to experimental psychology recur throughout Montessori's writings. She faults most experimental psychology with being too disengaged from practice, too focused on instantaneous characteristics rather than development, and too adherent to scientific models from physics and chemistry. These three criticisms are subsidiary to a fundamental objection, that environmentally-induced *dysfunction* is treated as a "normal" condition. The failure to recognize what really constitutes normalcy, particularly in children, is both the effect and the reinforcing cause of a failure on the part of scientists to be properly observant, so Montessori's critiques of experimental psychology give rise to a new ideal of the teacher-scientist who can create the conditions for children to express their normal tendencies and can properly observe these tendencies as they emerge.

2.1. Problems with experimental psychology: too disengaged ...

An oft-touted goal of modern science, including "scientific" psychology, is objectivity, where this is seen as a freedom from influence by particular interests and passions.⁷ Against this, and in line with pragmatist ideas afloat in Italy at the time,⁸ Montessori sees *dispassionate* psychology as deeply flawed. For one thing, she criticizes the experimental psychology of her day for being too disengaged from pedagogical practice, positing an alternative, *transformative*, notion of "objectivity."

They called the study of children 'scientific education,' even though the school itself remained unaffected by such studies. The new type of education, which I hoped to

⁷ For discussions of the general issue of objectivity in science, see e.g. Kuhn 1977, Daston and Galison 2007, Laudan 1984, and Longino 1990. For the purpose of setting up this Montessori alternative, I make use here of the simplistic but common conception of objectivity touted in most textbooks of scientific method.

⁸ For discussion, see James 1906; Santucci 1963; and Frierson, "Montessori's Epistemology," forthcoming.

introduce, was, on the contrary, based on objective research which, it was hoped, would ‘transform the school’ and act immediately upon the pupils, inspiring them with new life. As long as ‘science’ limited itself to the attaining of further knowledge about children, without attempting to rescue them from the many evils which this same science had discovered in the schools ..., no real claim could be made for any such thing as ‘scientific education’ ... (Montessori 1967: 41)

In part, her critique is directed against experimental psychology masquerading as *pedagogical* science without making real contributions to practice. Experimental psychologists “have usually sought to get from their experiments some contribution to psychology, or anthropology, rather than to attempt to organize their work and their results toward the formation of the long-sought Scientific Pedagogy” (Montessori 1912: 4; Montessori 1967: 3; see too Montessori 2013: 7).

One important dimension of this criticism is ethical, arguing for science to be put to practice for the betterment of humans’ (particularly children’s) lives. Given the cultural context of “an Italian society in search of a scientific technique useful in improving the education and training of ... school teachers” (Cicciola et. al. 2013:5), Montessori exhorts researchers to go beyond *mere* experimental psychology and engage in practical pedagogical science. Moreover, her personal commitments to progressive liberal ideals (see especially Foschi 2012) and her conception of “social medicine ... as an instrument for revolutionary change” (Babini 2000:61-2) fuel her ethical critiques of the practice of psychology.

But for Montessori, disengagement is also of specifically epistemic importance. Her “recognition of the priority of practice over theory” (Babini 2013:12⁹) is a broadly pragmatist

⁹ While I quote Babini here, I think that she overemphasizes the ethical component of this priority and underrates the epistemic (see Babini 2013).

recognition that adequate theoretical knowledge of the world is itself dependent upon practical interest. Montessori contrasts mere dilettantes with genuine scientists who have a true “capacity for observation” in terms of their degrees of *interest*:

the *soul of the scientist* is entirely possessed by a passionate interest in what he sees. He who has been “trained” to see, begins to feel interest, and such interest is the motive-power which creates the spirit of the scientist. (Montessori 1991: 102; see too Montessori 2013: 185; Montessori 1991: 179; compare James 1890:402)

Scientific research is fundamentally *interested* research, and those who lack the right kind of interest are unable to observe key features of human nature. Likewise lack of interest, or of the right kind of interest, precludes many empirical psychologists from being able to adequately *observe* children. Excellent experimental psychology requires “passion” (Montessori 1997: 70), and scientists who seek narrow data points to confirm or disconfirm prevailing theories conduct experiments in ways that ignore key aspects of children’s nature and development.

This emphasis on interest is not unique to science; for Montessori all knowledge – even the basic sensory experience that is the foundation of further thought – depends upon interest in order to guide attention: “Our attention is not arrested by things indifferently, but by those which are congenial to our tastes” (Montessori 1991: 124). Insofar as empirical psychologists fail to be genuinely and independently interested in the objects of their study, they will fail to see new phenomena or to see old phenomena in new (more accurate) ways. Trapped in traditional ways of thinking¹⁰ and without interests that direct attention and allow one to “perceive with exactness” (Montessori 2013: 226), one ends up “in a situation where the human intellect is oriented in one direction ..., precluding simple reasoning that would lead to the discovery of

¹⁰ For a detailed litany of such “prejudices,” see Montessori 1955.

great things as yet unperceived” (Montessori 2013: 224). This “slavery of thought” (Montessori 2013: 223), induced by the desire to fit into prevailing norms of the discipline rather than genuine love of the objects of one’s study (in this case, children), prevents experimental psychology from genuine insight into human (children’s) nature. Disinterest causes epistemic blindness.

2.2. ...too myopic ...

One key symptom of the disconnect between psychology and practice is a tendency for psychologists to narrow their vision of their subjects. Montessori objects, for example, to the practice of taking isolated snapshots of psychological characteristics at particular moments:

The study of the child cannot be accomplished by an ‘instantaneous’ process; his characteristics can only be illustrated cinematographically ... [T]he psychologist of today behaves somewhat like the child who catches a butterfly in flight, observes it for a second and then lets it fly away again ... (Montessori 1991: 86, 99)

[P]sychical researches of a moral order must also, if they are to be of any real value, be based upon prolonged observation ... [I]t is necessary ... to observe ... for a considerable time. (Montessori 1967: 8-9)

Montessori does not deny the importance of instantaneous observation of children’s characteristics and behavior; in that sense Foschi’s recent allegation that she “was absolutely uninterested in using the instruments of the laboratory for accumulating data” (Foschi 2012:120) is overstated. Movies are made of pictures, and Montessori’s own scientific method involves careful recording of children’s characteristics and behavior at particular times. But Foschi’s more tempered claim that “laboratory research is applicable only when integrated with

observations of children in liberty” (Foschi 2012:109) is exactly correct. To be pedagogically useful and genuinely informative, instantaneous observations must be integrated into a broader narrative, what in her early work was captured by a “biographical chart” or “biographic history” (Montessori 1913: 404ff.) that allows for a record of how environmental and developmental changes affect characteristics and behavior.¹¹ The central point is that without some sense of the background conditions and changes over time, one cannot appropriately theorize about the nature and causes of one’s observations. This is particularly true for the case of young children: “We cannot choose a random moment in life to give us a perfect understanding of the child’s personality” because “[t]he life of the child is nothing but rapid transformation and it is precisely this that is important” (Montessori 2013: 62). Her critique of the “arbitrary and superficial tests such as those [I.Q. tests] of Binet and Simon” (Montessori 1991: 86) illustrates this concern:

A series of formulæ, such as the Binet-Simon tests, can neither measure anything, nor give even an approximate idea of intellectual levels of intelligence according to age; as to the children who respond, whence is their response derived? How far is this due to the intrinsic activity of the individual, and how far to the action of environment? And if the portion due

¹¹ The biographical chart also marks an important part of Montessori’s critique of Lombroso and Sergi (see especially Montessori 1903; for some discussion, see Foschi 2012:33-5). Both of these broadly “anthropological” psychologists put heavy emphasis on exact physical measurements recorded in charts, but both over-emphasized the role of biology and physiology on psychological development. Thus in her course on Pedagogical Anthropology, which Professorship was awarded to her at Sergi’s recommendation, she continued to teach techniques for anthropological measurement but added this important biological chart, which would focus on social and properly psychological developments that are not reduced to physiological ones. As her method develops, the emphasis on measurements and charts of all kinds decreases, and the role Montessori at first ascribed to the biographical chart remains in her continued emphasis on carefully recording observations of children. The specific details of the chart are largely replaced by emphasis on an ongoing lived relationship with students over time in a classroom.

to environment be ignored, who can determine what intrinsic psychical value should be given to the response? (Montessori 1991: 87)

On similar grounds, she critiques her former colleague Sante De Sanctis, whose intelligence tests have been aptly describes as “photographing a difference in the level of mental capacity” (Cicciola et. al. 2013:6):

[I]n the mental *tests* which are used in France, or in a series of tests which De Sanctis has established for the *diagnosis* of the intellectual status, ... the factor of *culture* is forgotten, and by this I mean *sensory culture*. (Montessori 1912: 173-4)

By basing judgments on experiments that are isolated from (or precede) attempts at pedagogical intervention, psychologists fail to capture the most important facts about children’s mental capacities.¹² Insofar as empirical psychologists focus on isolated experiments, often in laboratory conditions, of randomly selected subjects, they are unable to answer the most important questions about how to explain the data they collect.

2.3. ...and too physicalist.

The tendency to take isolated snapshots of human beings is part of a broader tendency in “experimental psychology” to “adopt ... more or less the standard of laboratories of *physics*” (Montessori 1991: 98). Just as physicists and chemists embark on controlled experiments in the laboratory, so too psychologists treat human subjects as so many physical or chemical systems ready to be subject to controlled study. Cimino and Foschi rightly note how “the conquests of

¹² Montessori’s criticism here is importantly different from that discussed in section 2.1. Binet, Simon, and De Sanctis were all interested in putting intelligence tests to practical use. See Cicciola et. al. 2013; Foschi and Cicciola 2006.

[physical] science and technology favored the expansion of positivist thought ...; empirical and experimental method [would] be applied not only to nature but also to human beings,” such that “philosophers and scientists with a positivist orientation asked themselves whether and in what way it would be possible to study mental phenomena with the experimental and quantitative methods typical of the natural sciences” (Cimino and Foschi 2012:310, 319). Against this general trend, Montessori insists that while physics and chemistry deal with entities whose causal laws are general, fixed, and universal; psychology deals with *living* beings that must be studied as individuals. She writes an important early essay against “the Lombrosian theory,” which posited that “intelligence, the moral sense, the psyche, and all that makes us human individuals can be reduced to external forms,” insisting instead that we must “study the individual to distinguish ... and adopt educational methods appropriate to each” (Montessori 1903:329; see Foschi 2012:34). More generally, she insists,

In gathering the separate data, it may be said that we have learned how to *spell*, but not yet how to read and interpret the sense. The reading must be accomplished with broad, sweeping glances, and must enable us to penetrate in thought into the very synthesis of life. And it is the simple truth that *life* manifests itself through the living individual, and in no other way. (Montessori 1913: 27)

One key symptom of the problem with psychology modelled on physics is a definition of key psychological concepts in terms of simple measurements that lack any real connection to the phenomena that really matter. Montessori details, for instance, how experimental psychologists develop clever tests of “attention” that fail to provide insight into *true* attention.

We give an idea of the measuring of the attention of the child: the teacher gives the child a page to read [and] is armed with a chronometer which marks the hundredth part of a second

[and] ... say[s] to the child "... mark out all the A's which you find" ... and she marks the time ... and counts how many mistakes the child has made ... The means of research are very exact but the thing being studied escapes the measurements and you can easily understand that while the child is crossing out the A's, he is neither able to develop his attention nor is he learning. (Montessori 1997: 140)

Scientists develop very precise means for collecting data, but the data is irrelevant to assessing any sort of attention that matters, and the collection of the data inhibits rather than fosters the child's development.

Moreover, for Montessori, the precise data that experimental psychologists do collect actually confirms the error of coopting of techniques from physics.

[E]xperimental psychology was established in 1860 by Fechner, who was a physicist accustomed to experiment on *things*, not on living creatures, and who merely adapted the methods employed in physics to psychical measurements, thus founding psycho-physics. The instruments specially invented for esthesiometric measurements were of extreme precision; but the results obtained showed such variations that by mathematical law they could not be attributed to "errors of measurement," but were obviously due to "errors of method." ... In spite of this startling contrast between the precision of the means of research and the huge variations in the results, which were shown by mathematical law to be absurd, experimental psychology carried on extensive studies, under the illusion that it rested upon a mathematical basis. (Montessori 1991: 46)

Or, as she put it in 1913, "the results of this science were not as exact as the investigating instruments led people to imagine they would be. Analogous reactions ... varied greatly" (Montessori 2013: 6). Despite finding inconsistencies and variations that would never be

tolerated in physics, experimental psychology continued to use standards and methods typical of the physical sciences, seeking to “reduce humanity to the laws of physics” in a “ruthless effort” (Montessori 2013: 7). Many statistical methods of modern psychology continue this tendency, covering over wide variations in psychological results with a mock precision that makes “spiritual” – that is, irreducibly psychological – systems seem like physical ones.

In launching this critique, Montessori opposes an important strand of early 20th century Italian positivist psychology. As Cimino and Foschi aptly describe this approach, “The experimental method in psychology, conceived and practiced by the positivist psychologists, ... led to relating mental phenomena and physico-physiological phenomena [because t]he latter are quantifiable and measurable” (Cimino and Foschi 2012:319). By sharply critiquing this effort of overly conflating psychology with physical systems, Montessori also obliquely critiques her (former) mentor Sergi, who insisted that “mental phenomena” could “be reduced to physiological phenomena” (Foschi 2012: 313, see Sergi 1881:xvii-xx). Even while making use of some of Sergi’s techniques of measurement, she shifts towards a less quantitative and less physicalist “observational” psychology. She thereby takes a middle path between Sergi’s approach and the alternative offered by Roberto Ardigò, another forefather of Italian experimental psychology. Ardigò was an anti-reductionist who argued that “mental acts [are] not observable elsewhere than within consciousness” so that *psychology* must be “special and distinct from physiology” (Ardigò 1870/1882:173, quoted in Cimino and Foschi 2012:311). Ardigò emphasized introspection as a method of psychological research, while Sergi’s anthropological method focused on measuring physical and physiological characteristics (including, e.g. skull size and shape) to gain insight into psychological processes and possibilities. Against Ardigò, Montessori insists that one can observe the mental development of

others (children); against Sergi, she objects to reducing psychological powers to physical (or even narrowly physiological) ones.

Finally, one poignant and eerily prescient expression of Montessori's concern with treating human beings as mere physical-chemical systems arises in her criticism of emerging chemical (psychopharmaceutical) approaches to mental health, where she compares them to early 20th century orthopaedic measures to counteract the negative effects of desks on physical development. Already in 1936, she wrote,

In the not far distant future, when these auxiliary sciences of the school and pedagogy shall have made due progress, we shall perhaps see, side by side with the orthopaedic ward, a physio-chemical clinic, where every evening the pupils ... may enter with a kind of ... prescription regulated by the teaching they have undergone, and receive an injection which will deliver them from the poisonous effects of fatigue!

This reads like an irony of the worst kind, perhaps; but this is not the case. Where the orthopaedic institution is already an accomplished fact, we may very soon see the chemical clinic established. If a problem of liberty is to be solved with machines, and if a problem of justice is to be regarded from the chemical point of view, similar consequences will be the logical end of sciences developed upon such errors.

It is obvious that a real experimental science, which shall guide education and deliver the child from slavery, is not yet born; when it appears, it will be to the so-called "sciences" that have sprung up in connection with the diseases of martyred childhood as chemistry to alchemy, and as positive medicine to the empirical medicine of bygone centuries.

(Montessori 1991: 50-51)

After employing pedagogical methods that treat children as material to be assembled into knowledge-filled automata, science then (in Montessori's day, but apparently even more today¹³) makes use of chemical therapies to prevent or counter-act the natural responses of living and freedom-seeking beings to such treatment. Meanwhile psychologists retain the illusion of standardization where human psychology is suitably studied in the same way physical or chemical systems are.

Whether in the extreme appeal to pharmacology or in more subtle ways human beings are studied using laboratory and theoretical techniques taken from physics and chemistry, psychologists too easily remain “ignorant... and unaware that there is something to be observed before measuring,” and in particular that “there is a *psychic* organism, living as the body lives” (Montessori 2013: 46). Throughout, “the means of research are very exact, but the thing ... being studied escapes” (Montessori 1997: 140).

3. Human potential, deviance, and normalization

These critiques – of insufficient practical interest, narrow time-horizons of study, and overly mechanistic attitudes towards psychology – are all subsidiary to Montessori's fundamental objection to the experimental psychology of her day, which is that it inhibits the discovery of children's *potential* when that potential, for whatever reasons, is not being adequately realized. Experimental psychology as generally practiced ends up being a study of children only in abnormal, deviant forms that permeate modern societies due to poor conditions in which children are placed, rather than discovery of what they can and should be. She compares this study of children “repressed in the spontaneous expression of their personality till

¹³ See DeGrandpre 2000.

they are almost like dead beings” to the attempt to discern the nature of butterflies by their behavior when “mounted by means of pins, their outspread wings motionless” (Montessori 1912: 14, Montessori 1967: 8-9). As Valera Babini aptly put it,

Because of her professional experience ..., Maria Montessori understood a fundamental principle, the cornerstone of her conception of pedagogy, that the physical limitation of personal freedom ... is destined to produce ... mental constraints that stifle the free development of the personality [and] ... worsen the ... potential. (Babini 2013:18)

Montessori’s own career as the educator and developmental psychologist she became was “the result of my experiences during two years in the ‘Children’s Houses’” first established in the slums of Rome (Montessori 1912: 30). As she rightly notes, “this experience with normal children ... sprang from preceding pedagogical experiences with abnormal children, and [thus] ... it represents a long and thoughtful endeavor” (Montessori 1912: 31), not only on the part of Montessori herself, but also through her appropriation of insights from her mentor De Sanctis (cf. Foschi 2009) and especially through her careful attention to “the forty years of work done by Itard and Séguin” on mentally deficient children (Montessori 1912: 46; for discussion, see Kramer 1975; Foschi 2012). But it was in her work in the Children’s Houses that Montessori’s fundamental insight came, when she observed a phenomenon of intense, focused attention in a young girl (see Montessori 1991: 53), a phenomenon she came to associate with what she called “normalization.” As she refined the environment of the school to meet the needs of the children in it, and particularly to provide them with occasions for freely chosen work, she – and those who repeated her methods – found a consistent pattern of “normalization,” a sort of “child conversion” that is really “a psychological recovery, a return to *normal conditions*” (Montessori

1996: 157). These normal conditions are, as it were, a different *nature* from that studied by ordinary empirical psychologists.

Montessori's "discovery" of this different nature was, by her own account, largely accidental. Anticipating Kuhn's account of the emergence of anomalies in scientific theorizing (though with a more prominent role for luck and less importance for normal science), Montessori explains:

It is impossible to observe something that is not known, and it is not possible for anyone all at once, by a vague intuition, to imagine that a child may have two natures and to say, 'Now I will try to prove it by experiment.' Anything new must emerge, so to speak, by its own energies; it must spring forth and strike the mind, evoked by what we call chance. Often there is no one more incredulous than the person to whom this happens; he rejects the new fact just like everyone else ... A new phenomenon is an initial discovery of facts, previously unknown and therefore unsuspected. (Montessori 1996: 116-7)

Precisely because she discovered something that no one was even looking for, it was not the sort of discovery susceptible to ready study within paradigms of psychology that take the abnormal but typical nature of children as *the* nature of children. And normalization brings with it a *radically* different character of childhood from that typically observed in children accustomed to the inhibition, repression, and punishment typical of most schools (and homes):

Child psychology could not of itself have discovered the natural characteristics and the consequent psychological laws that govern a child's development because of the abnormal conditions existing in the schools. These made the students adopt an attitude of weariness or self-defense instead of enabling them to give expression to the creative energies that naturally belonged to them. (Montessori 1967: 41-2)

Observing the features that disappear with normalization, we find to our surprise that these embrace nearly the whole of what are considered characteristics of childhood ... Even the features that have been scientifically studied as proper to childhood, such as imitation, curiosity, inconstancy, instability of attention, disappear. And this means that the nature of the child, as hitherto known, is a mere semblance masking an original and normal nature. (Montessori 1996: 159)

A psychology disconnected from pedagogical practice, particularly one that collates statistical regularities from instantaneous snapshots of children as they happen to be when they come in to the lab (or the testing center), will not be likely to make the kinds of observations and adjustments that unleash the potential Montessori found in the children in her schools.¹⁴

Montessori's discovery of the "normal" child leads to a new focus of research. Just as in any science,

When it is the case of proving the existence of a new fact, it must be proved that it exists ... that is, it must be isolated. Then comes a second phase, the study of the conditions in which the new phenomenon shows itself, so that we may reproduce and perpetuate it. Only when this fundamental problem has been solved, is it possible to study the phenomenon; it is then that research begins, and finding new things on the new path, investigators may make further genuine discoveries. (Montessori 1996: 117)

Much of Montessori's early career was spent on this "second phase," the careful study of the environmental conditions under which normalization occurs. The key to normalization is the

¹⁴ For other reasons Montessori offers for why her observations were "officially relegated to oblivion [and] did not succeed in attracting the interest of modern psychology" (Montessori 1955: 32), see Montessori 1955 (but compare Cohen 1969; Kramer 1975)

child's ability to "fix his attention" on an object of purposeful work (Montessori 1991: 119), from which follow all the other "miracles" of normalized childhood (Montessori 1991: 56, 71). Her pedagogical principles and materials are thus oriented around this fundamental goal: to "provide 'motives for activity' so well adapted to the child's interests that they provoke his deep attention" (Montessori 1995: 206). And her conception of experimental psychology emphasizes the importance of further research on children under "normal" conditions. Thus in addition to insisting that "psychical researches ... be based upon prolonged observation," Montessori adds that this observation must take place "*after the internal activities have become orderly*" (Montessori 1991: 90, emphasis original, see too Montessori 1991: 86-7, 99; Montessori 1912: 14-15; Montessori 1967: 8-9). One must *first* "reduce the chaotic internal world of the child to order" and only then observe for the purpose of gleaning an account of human nature.

To trace the guiding instincts in man is one of the most important subjects of research today... Their study is only possible in the normalized child, who lives in freedom in an environment fitted to the needs of his development. (Montessori 1996: 220)

All important topics of research in developmental psychology, to give an accurate picture of what children are capable of in healthy conditions, must *first* provide the context for normalcy and only *then* engage in careful observation and study.

4. The teacher-scientist and the prepared environment

Montessori's critiques of the experimental psychology of her day gives rise to her conception of the positive conditions under which scientific knowledge of normal children can be properly attained. She repeatedly asks, as in one lecture in 1913, what scientists do who study other (non-human) living beings:

When, for instance, people wish to study insects ... [t]hey go where the insects live naturally and they try not to disturb them so as to see exactly all their doings ... Why do otherwise when studying humans? ... Why put them in a laboratory and torture them with experiments? ... Let us ... study humans in their natural state. (Montessori 2013: 8)

The problem, of course, is discerning precisely what the “natural state” for human is. Montessori rejects the view that one can simply take people as one finds them and ask them to perform various psychologically-testable tasks:

It is strange to think that among all these laboratories of natural science, only that of “experimental psychology” has judged it possible to dispense with an organization for the preparation of the subjects to be observed ... Psychologists consider that they can prepare their “subjects” by arresting their attention with a word, and explaining to them how they are to proceed in order to respond to the experiment; any unknown person met by chance in the laboratory will serve their purpose. In short, the psychologist of today behaves somewhat like the child who catches a butterfly in flight ... not like the biologist who takes care that his preparations are properly carried out in a scientific laboratory.

On the other hand, the picture of psychological development, even though it be incomplete, which is shown to us in our experiments, demonstrates the subtlety with which it is necessary to present to the child the means of his development and, above all, to respect his liberty; conditions which are essential to ensure that psychical phenomena be revealed and may constitute a true “material for observation”; all this demands a special environment, and the preparation of a practical staff, forming a whole infinitely superior in complexity and in organization to the ordinary natural science laboratories. Such a laboratory can only be the most perfect school, organized according to scientific methods. (Montessori 1991: 98-99)

The sort of laboratory appropriate to the study of children's pedagogical possibilities is a *school* (cf. Montessori 1991: 47), but most schools are so pervaded with structures that inhibit the emergence of "normalcy" that a new kind will be needed, one that "give[s people] the best conditions of life" (Montessori 2013: 8). Only in a context with excellent conditions for living can children (or any organism) exhibit their most natural and spontaneous development.

In order that the phenomenon should come to pass it is *necessary* that the spontaneous development of the child should be accorded *perfect liberty* ... But to ensure the psychical phenomena of growth, we must prepare the "environment" in a definite manner, and from this environment offer the child the external means directly necessary for him. (Montessori 1991: 56; see too Montessori 2013: 54)

As with butterflies observed in the wild, children allowed to act freely will be able to show what is truly "normal" or "natural" to them. But unlike the butterfly, the world in which children typically live and operate is both highly artificial and largely focused on constraining their behavior.¹⁵ Thus an environment for properly studying human capacities must be specially *prepared* for humans' (particularly children's) spontaneous activity.

Much of Montessori's lifetime work was spent developing such an environment by studying the appropriate conditions for the emergence of "normal" children.¹⁶ As she notes, the great value of an environment specially adapted in this way to the needs of children ... was more than protective and might almost be called "psychological." Yet its value ... depended on the things provided for the children's use, ... [which] were not decided upon

¹⁵ Montessori lays out in detail the ways in which adults have created an environment much less conducive to children's spontaneous activity than the conditions of early human beings (see Montessori 1992: 15). I discuss this in more detail in Frierson, "Making Room," forthcoming.

¹⁶ I have discussed some details of these conditions in {Author under review b}.

arbitrarily but only as a result of prolonged experimentation with children themselves.

(Montessori 1995: 222-3)

The nature of this “experimentation” involved “let[ting] the children ... guide us” by “equipping the child’s environment with a little of everything” and leaving “the children to choose those things they preferred” (Montessori 1995: 223). The result was a set of specific materials in each classroom, and also various general principles of correct environments for children, such as that materials in the room should be child-sized, that “the child needs tangible things on which to focus attention” (Montessori 1995: 223), and that materials need to incorporate a “control of error” (Montessori 1995: 247f.).

In addition to an environment within which subjects can act freely, the progress of experimental psychology depends upon the right kinds of *scientists*, who avoid disinterested myopic physicalism by being at once capable of observing human subjects over long periods of time, attuned to what is genuinely “spiritual” in the objects of their observation, and *interested* in what they study: “One must have this special direction for psychological observation, that is, one must know what to observe, what to think is *interesting*” (Montessori 1997: 138, emphasis added). For experimental psychology to be of genuine pedagogical importance, moreover, a new kind of teacher is required, one attuned to seeing students as living beings with something to teach her rather than merely as vessels needing to be filled or animals needing to be corralled. Montessori contrasts the “regular teacher” who “teaches something” specific and is like a “dress-maker who ... makes the garment ... cutting off and putting together in her way” with excellent teachers according to Montessori’s method, who, “as scientists,” prepare an environment, await

the phenomenon, and observe (Montessori 1997: 172). In a word, both experimental psychology and practical pedagogy require the emergence of genuine “teacher-scientists.”

The truth is that the practical progress of the school demands a genuine *fusion* of these modern tendencies, in practice and thought; such a fusion as shall bring scientists directly into the important field of the school and at the same time raise teachers from the inferior intellectual level to which they are limited today. (Montessori 1912: 4)

The scientist is a seer within the limits of his field of observation; the saint is a spiritual seer, but he also *sees* material things and their laws more clearly than other men, and invests them with spirit ... The vision of the teacher should be at once precise like that of the scientist, and spiritual like that of the saint. The preparation for science and the preparation for sanctity should form a new soul, for the attitude of the teacher should be at once positive, scientific, and spiritual. (Montessori 1991: 106-7, see too Montessori 2013: 276; Montessori 1997: 69-74)

Both schools and psychology as a discipline require teachers who *love* their students (hence manifesting passionate *engagement*), remain involved with them over sustained periods (hence avoiding temporal myopia), and know how to *observe* them with attention to their *spirit* (hence avoiding physicalism).¹⁷ All of these traits unite “[w]hen the teacher develops the method of the modern scientist” such that “patience and constancy ... have been transformed into ... a passion making her joyously observe the phenomenon before her eyes” (Montessori 1997: 70).

¹⁷ Montessori was widely characterized as this sort of teacher-scientist. One commentator noted her “genius for empathy with the child” (Elkind 1967, cited in Chattin-McNichols 1992:155), and her ability to pick up on the child’s life of the mind is evident throughout her writings and various accounts of her life (e.g. Standing 1984).

Montessori places particular emphasis on means for cultivating the right kind of *observation*: “this is what the teacher must know: how to observe” (Montessori 2013: 44; Montessori 1997: 138). One reason for this relates to the particular history of her own “discovery” of the “normalized” child, which required an attuned and passionately-engaged but still open-ended observational acuteness. Rather than trying to make each child conform to some set standards, or to stand back and merely let them run wild, Montessori was sufficiently engaged to notice that a child was doing something extraordinary (concentrating on cylinder blocks) and sufficiently patient to carefully follow through on that observation (rather than, say, making the child join the others in song).

But her emphasis on observation applies even beyond the cases of initial recognition of phenomena anomalous with expectations. *All* sciences depend upon specialized, cultivated skills of observation:

Now it is obvious that the possession of senses and of knowledge is not sufficient to enable a person to observe; it is a habit which must be developed by *practice*. When an attempt is made to show untrained persons stellar phenomena by means of the telescope, or the details of a cell under the microscope, however much the demonstrator may try to explain by word of mouth what ought to be seen, the layman cannot see it. When persons who are convinced of the great discovery made by De Vries go to his laboratory to observe the mutations in the varied minute plants of the *Ænothera*, he often explains in vain the infinitesimal yet essential differences, denoting, indeed, a new species, among seedlings which have hardly germinated. It is well known that when a new discovery is to be explained to the public, it is necessary to set forth the coarser details; the uninitiated cannot take in those minute details

which constituted the real essence of the discovery. And this, because they are unable to observe. (Montessori 1991: 102)

Something like the untrained person's observational failure is endemic within both academic psychology – where scholars treating people as particles fail to see their temporally-extended, spiritual lives – and pedagogy – where teachers focused on delivering content to students fail to attend to them as beings capable of worthwhile, spontaneous activity of their own.

If, therefore, pedagogy is to take its place among the sciences, it must be characterized by its method; and the teacher must prepare herself, not by means of the content, but by means of the method. In short, she should be distinguished by *quality* even more than by *culture*. The fundamental quality is the capacity for “observation.” (Montessori 1991: 102)

For the sake of good pedagogy *and* good experimental psychology, teacher-scientists with well-honed skills of observation are needed.

Montessori provides various concrete tools for cultivating observation. Of these, the most important are her specific examples of “normalized” children. As she explains in detailing the ordinary progress of empirical sciences, after one has discovered a new phenomenon, succeeding phases involve studying “conditions in which the new phenomenon shows itself, so that we may reproduce and perpetuate it” and only then does real “research [that is, in Kuhnian terms, normal science] begin” (Montessori 1996: 117, cf. Kuhn 1996). By isolating at least the most basic material conditions under which “normal” children emerge and identifying the general features of normalization, she equips teachers to carry on the ongoing task of observing further details. She offers a paradigm for normal observations. The classrooms themselves and their associated materials, combined with Montessori's accounts of effects of those materials on various children, are laboratories that facilitate observation. Thus in almost all of her training

courses, teachers are involved in direct observation of classrooms as part of “teacher” training.

As she explains in one such course,

[W]hen you are in the Casa di Bambini [Montessori school] to observe the children, you are working ..., laboring to learn something which I do not give ... and which no one else gives. If you do not possess this capacity, especially this sensitiveness which allows you to learn the intimate facts which the children reveal without warning to anyone as to which is an important thing or which is worthy of claiming attention, then this sensitiveness, this capacity for observation, is the labor which you must accomplish in yourselves ... You alone can prepare yourself to observe. (Montessori 2013: 21-22)

Despite this exhortation to self-learning, Montessori provides other, more specific, tools as well, such as instructions for keeping a “biographical chart” of each student. Unlike those charts typical at the time or those tests standard now that “are satisfied to catch a moment in the child’s life” (Montessori 2013: 42), Montessori “does not give a long formula of analytical studies, but ... a ‘guide to psychological observations,’ founded upon the synthetical conception which I have sought to illustrate” (Montessori 1991: 95, see too e.g. Montessori 2013: 38ff.).

Ultimately, however, Montessori emphasizes that “The quality of observation comprises various minor qualities, such as *patience*” (Montessori 1991: 102-3), qualities that cannot be taught in a book or set of instructions.¹⁸ Even with respect to her biographical chart, “Those who have not been initiated into this method of observation will gain no light from such a guide, which lies entirely outside the conceptions of psychological study now obtaining in connection

¹⁸ I discuss the relationship between these epistemic values and contemporary virtue epistemology in Frierson, “Montessori Virtue Epistemology,” currently under review. For comparison of this inward formation to the thought of Franco Basaglia, see Babini 2013. For an overstated (and misleading) description of this preparation as a kind of religious indoctrination, see Cohen 1969.

with the observation of pupils. But those who have been initiated will understand it without the aid of illustration” (Montessori 1991: 95). Thus Montessori largely instructs in observing children through example and exhortation. Her lectures and books are permeated with accounts of how attention to details in a child’s behavior reveals otherwise easy-to-miss activity. Her reiterated insistence upon the importance of observation and avoiding interrupting children in their work also offers a corrective space to teachers whose natural impulse is to didactically instruct, or at least to praise and correct, active children.

Observation, while it is the “fundamental quality” of scientific pedagogy, does not stand alone. Montessori particularly emphasizes that the kind of observation required of teacher-scientists is one that is *involved* in the lives of those it studies because it *cares* about them.

To observe it is necessary to be “trained,” and this is the true way of approach to science.

For if phenomena cannot be *seen* it is as if they did not exist, while, on the other hand, the *soul of the scientist* is entirely possessed by a passionate interest in what he sees ..., and such interest is the motive-power which creates the spirit of the scientist ... [I]n the teacher interest in the phenomenon observed will be the center round which her complete new personality [that of the teacher-scientist] will form spontaneously. (Montessori 1991: 102)

Scientists are passionately interested in their work. (Montessori 1997: 69)

The problem of disengaged experimental psychology is solved with a twofold relationship between observation and passion. The scientist is *able* to see *because* he has a passionate interest in the object of his investigation, and this seeing further cultivates that interest. For Montessori, this is the spirit of *all* sciences, whether one is interested in stars or rocks or butterflies or children. But the force of passionate interest is most acute in the case of psychology,

for the other men of science must always remain extraneous to the object of their study ...

[b]ut the object of the schoolmaster is man himself; the psychical manifestations of children evoke something more than *interest in the phenomenon*; he obtains from them the revelation of himself. (Montessori 1991: 106; see too Montessori 1997: 69-73)

For the teacher who is “in the same category as the modern experimental scientist” (Montessori 1997: 70), observation flows from and cultivates not only the general scientific interest in knowing the world but also the specific set of passionate engagements involved in *self*-knowledge.

Properly fostering these interests, however, involves “cultivat[ing] ... certain aptitudes of a moral order ... [T]he educator must prepare himself *inwardly*” (Montessori 1996: 107). This need for inward work is present in all sciences: “we must master and control our own wills, if we would bring ourselves into relation with the external world and appreciate its values” (Montessori 1991: 104). One must, for example, have the humility to “renounce all those cherished ideas of his own that may diverge” from what his studies reveal (Montessori 1991: 105). But the need for inner, moral reform is *particularly* important in the context of studying children. Adults, Montessori claims, have tendencies of domination and control that must be resisted in order to properly love – and observe – children. She details how adults’ “seven deadly sins” find, in children, weak adversaries, so tendencies towards pride and anger can make use of children as outlets (Montessori 1996: 107-9). We thus become “too preoccupied with bad tendencies in the child [and] how to correct undesirable actions” (ibid. 107) or simply desirous of various forms of “tyranny” whereby we force children to conform to our needs and desires (ibid. 112). Thus teacher-scientists must start with “*humility*” (Montessori 1996: 114; Montessori 1991: 104). Along with humility comes patience, a crucial virtue for both scientists and teachers,

who must bear with the radically different pace of life natural to children (see Montessori 1991: 102-3). Experimental psychology, in Montessori's hands, thus requires the cultivation of various virtues – epistemic but also moral – for its proper exercise. Rather than a kind of objectivity that aims for standardized results in laboratory conditions and requires little of researchers and only a bit of time on the part of research subjects, Montessori's pedagogical psychology requires teacher-scientists constantly vigilant in “rid[ding themselves] of the inner obstacles which make the child incomprehensible” (Montessori 1996: 108), an environment that allows children sustained opportunities for work and social life, and research “subjects” who live significant portions of their lives “in the lab.”

5. Experimental psychology today.

Montessori's criticisms and revisions are directed towards the experimental psychology of the early 20th century, and one commentator (her grandson) has pointed out that

If we view the relationship between Montessori education and modern psychology as a whole, it can be observed that until World War II applied psychology was predominantly laboratory psychology. Montessori education, which is based on an empirical experiment with children in concrete life situations, could do very little with it ... Since World War II psychology has developed rapidly, and there has been a growing interest in the concrete behavior of man in ordinary, everyday situations. Because of this, the divergence between Montessori education and psychology has decreased. (Montessori 1976/1992:42-43)

The approaches to psychology that were the primary context for and targets of Montessori's objections – behaviorism, psychoanalysis, and Italian positivism – have largely fallen out of favor within mainstream experimental psychology. Efforts to make psychology practical

(particularly in clinical contexts) and to consider how to promote positive outcomes rather than merely combat disorders (particularly within positive psychology) are now mainstream. And many psychologists are involved in studies that follow children over longer periods of time and with more attentiveness to environmental conditions. One might thus consider Montessori's critiques outdated. And her alternative approach might seem equally outdated. The sort of "interested" observation Montessori puts at the center of her approach might seem overly biased in a context where double-blind experimental procedure is a norm. The notion of teacher-scientists seems to collapse the increasing specialization throughout the sciences, including in psychology, and the extended classroom-as-laboratory not only raises potential ethical and political concerns but even seems to compromise the isolation of variables, rigorous consistency, and "objective" stance of contemporary laboratory psychology.

At the same time, developments in psychology have incorporated and validated many of Montessori's key claims. Her emphasis on the role of movement in cognitive development, the importance of choice in early learning, the nature of children's "sensitive periods" for acquisition of particular skills, the danger of extrinsic rewards and motivation, and the centrality of a well-ordered environment have been repeatedly vindicated in the hundred years since she developed these ideas.¹⁹ Moreover, the increasing acceptance of various models of scientist-practitioner, particularly medical doctors and clinical psychologists, makes Montessori's vision of a teacher-scientist not only plausible, but a creative and important possible contribution to thinking about the discipline of developmental psychology (where, today, students are generally funneled into

¹⁹ For a detailed summary of Montessori's ideas in relation to contemporary experimental psychology, see Lillard 2005. For an overview, along with a survey of other important studies of Montessori pedagogy, see Foschi 2012:128-45.

either teaching or psychological research, rather than being encouraged to do research in developmental psychology by teaching children). Moreover, many of Montessori's critiques of experimental psychology remain as important as ever. Much contemporary experimental psychology continues to rely on isolated snapshots, and Montessori's own model of the teacher-scientist who is in extended contact with children over long period of time, carefully recording their development, still reflects a level of attention rarely (if ever) achieved in mainstream psychological research. There are extremely few scientists studying children in the quantities and depth that occurs within Montessori schools, where individual teacher-scientists follow a group of 25-35 students at a time for periods of 3-6 years.²⁰

Equally importantly, Montessori's fundamental claim about normalization – and the difference between the typical and the normal – is all-too-often missed in both psychological studies and the philosophical literature that appropriates these studies. For ease of exposition, I consider only one example that can help illustrate the more general point about normalization and show how Montessori's overall critique can helpfully enrich on-going philosophical debates about the proper implications of psychological research. Over the past several decades, a string of research by top experimental psychologists has shown that human behavior is highly situation-dependent. From Milgram experiments on deference to authority²¹ to experiments

²⁰ Compared to this level of observation, Piaget's focus on his own three children is comically narrow in scope, even if longitudinally better than most contemporary work. Even Kohlberg, who included long-term studies of large numbers of children (see e.g. Kohlberg 1968), cannot approximate the combination of length of contact, depth of engagement, and quantity of children observed by long-term teachers in multi-level classrooms.

²¹ See Milgram 1963. For philosophical discussion of this and related cases, see Doris 2002: 39-51; and Miller 2013. Related research on the so-called "Lucifer Effect" (see especially Lombardo 2007) also fits into this general category of situationist research that studies abnormality as though it is normality, though Lombardo has longer

showing situation-dependence of praiseworthy moral traits like generosity and compassion,²² psychologists have conducted isolated, snapshot studies of human behavior in particular situations, noting statistically-significant dependence of behavior on the details of those situations. These studies, however, and particularly the philosophical appropriations of them by philosophers such as John Doris (Doris 2002) and Gilbert Harman (Harman 2000), manifest all of the worst problems to which Montessori draws attention in her critique of experimental psychology. Subjects are studied for short periods in highly artificial laboratory conditions. There are, nearly universally, exceptions to the supposed situation-dependent responses of subjects, but these exceptions are largely ignored. There seems little interest on the part of researchers in discerning what factors lead subjects to the kinds of situation-dependent response they exhibited, and no interest in why some subjects were able to avoid characteristic forms of situational manipulation. Throughout, statistically common responses are treated as “normal,” so that if most people, say, defer to authority even to the point of torturing an innocent victim or fail to help a person in need when in a hurry, these responses are taken to reflect basic facts about human nature rather than contingent (and abnormal) conditions.

Montessori’s criticisms of such uses of experimental psychology are not unique to her; they are shared by contemporary philosophers such as Rachana Kamtekar (2003), Pauline Kleingeld (2014), and myself (2010, 2013). Like Montessori, these critics point out that precisely because it takes a random sample of ordinary people in our present society, situationist research fails to focus on what is “normal” to human nature, where normal is understood in a

time-horizons of investigation (but still not long enough) and gives more attention (though still not enough) to causes of the varying degrees to which subjects are susceptible to environmental manipulation.

²² See, e.g., Darley and Batson 1973.

value-loaded (whether Aristotelian or Kantian) way. Such research thus makes certain ideals seem unrealistic merely because they are not currently realized. But Montessori goes further that these critics in several respects. Most importantly, she develops a positive research program based on an *empirically-grounded* insight into what is developmentally possible for children. Her account of normalization is, as she emphasizes, not derived from “general principles or abstract philosophical ideas” (Montessori 1913: 14) but from actual observation of the effects of certain environments on human possibility. And her critique of experimental psychology is not merely negative and theoretical – pointing out that psychology has not shown certain ideals to be impossible – but positive and practical, leading to the establishment of thousands of schools in which the concrete expression of these ideals is a lived reality.

Some features of Montessori’s philosophy of experimental psychology are outdated. Her specific focus on behaviorist and (early) psychoanalytic approaches does not directly relate to the contemporary psychological scene, and many of her particular claims about methodology and especially particular details of human development have been incorporated into mainstream psychology. But Montessori’s fundamental criticisms of disinterested research, experimental myopia, physicalism, and particularly her attention to the danger of treating what is common as what is normal, all remain important critiques today. Moreover, as the case of recent philosophical appropriations of situationist psychology shows, the dangers of bad psychology easily spill over into bad philosophical claims about human nature. In particular, it is important, for Montessori but also for philosophers like Aristotle and Kant, to articulate a positive account of the relationship between not-yet-widely-realized ideals of human functioning and the (often problematic) findings of contemporary psychology. To develop that account will require an

integration of philosophy, psychology, *and pedagogy*, and Montessori provides an excellent early 20th century example of just such an integration.

References

- Appiah, A. (2008) *Experiments in Ethics*. Cambridge, MA: Harvard University Press.
- Archard, D. and Macleod, C. (2002) *The Moral and Political Status of Children*. Oxford: Oxford University Press.
- Ardigò, R. (1870/1882) *La psicologia come scienza positive*. In *Opere filosofiche*, v. 1. Mantua: Colli, pp. 53-431.
- Babini, V.P. (2000) "Science, Feminism, and Education: The early work of Maria Montessori." Trans. S. Morgan and D. Pick. *History Workshop Journal* 49:44-67.
- Babini, V.P. (2013) "Scienze umane e pratica di democrazia. Da Maria Montessori a Franco Basaglia." *Rivista sperimentale di freniatria* 137:9-32.
- Babini, V. and Lama, L. (2000) *Una "donna nuova": Il feminism scientifico di Maria Montessori*. Milan: Franco Angeli.
- Bazin, C. (2011) "Maria Montessori incontra il Cattolicesimo dale Suore Francescane Missionarie di Maria." In *La cura dell'anima in Maria Montessori*. Ed. L. De Sanctis. Rome: Fefè Editore.
- Bishop, M. and Trout, J.D. (2005) *Epistemology and the Psychology of Human Judgment*. Oxford: Oxford University Press.
- Bornstein, M. H. (1989) "Sensitive periods in development: Structural characteristics and causal interpretations." *Psychological Bulletin* 105:179-97.
- Chatin-McNichols, J. (1992) *The Montessori Controversy*. Albany, NY: Delmar Publishers.

- Cicciola E., Foschi R., Lombardo G. P. (2013). "Making up intelligence scales: De Sanctis's and Binet's tests 1905 and after." *History of Psychology*. Advance online publication. doi: 10.1037/a0033740.
- Cimino, G. and Lombardo, G.P. (2004) *Sante De Sanctis tra psicologia generale e psicologia applicata*. Milan: Franco Angeli.
- Cimino, G., Foschi, R. (2012). "Italy." In *The Oxford Handbook of the History of Psychology: Global Perspectives*. Ed. D.B. Baker. Oxford: Oxford University Press, pp. 307-346.
- Cives, G. (2000) "Carattere e senso delle varianti di Il Metodo," in Maria Montessori, *Il Metodo della Pedagogia Scientifica applicato all'educazione infantile nelle "Case dei Bambini"*. Edizione critica. Rome: Opera Nazionale Montessori.
- Cohen, S. (1969) "Maria Montessori: Priestess or Pedagogue?" *Teacher's College Record* 71:313-26.
- Darley, J.M. and Batson, C. D. (1973) "From Jerusalem to Jericho: A Study of Situational and Dispositional Variables in Helping Behavior," *Journal of Personality and Social Psychology* 27: 100-8.
- Doris, J. (2002) *Lack of Character: Personality and Moral Behavior*. Cambridge: Cambridge University Press.
- Daston, L. and Galison, P. (2007) *Objectivity*. New York: Zone Books.
- DeGrandpre, R. (2000) *Ritalin Nation: Rapid-Fire Culture and the Transformation of Human Consciousness*. New York: W.W. Norton and Co.
- Doris, J. (2002) *Lack of Character: Personality and Moral Behavior*. Cambridge: Cambridge University Press.
- Elkind, D. (1967) "Piaget and Montessori." *Harvard Educational Review* 37:535-45.

- Foschi, R. (2008). "Science and Culture around the Montessori's First 'Children's Houses' in Rome (1907-1915)." *Journal of the History of the Behavioral Sciences* 44:238-257.
- Foschi, R. (2009) "La Psicologia Sperimentale e L'Antropologia nella Storia del Metodo Montessori," in *Psicotecnica: Ieri! Oggi? Domani?* (ed. H. Gundlach et. al.) Lecce: Aracne Publishing, p. pp. 119-132
- Foschi, R. (2012). *Maria Montessori*. Rome: Ediesse.
- Foschi, R. and Cicciola, E. (2006) "Politics and Naturalism in the 20th century psychology of Alfred Binet." *History of Psychology* 9:267-89.
- Frierson, P. (under review) "Montessori Virtue Epistemology."
- Frierson, P. (forthcoming) "Maria Montessori's Epistemology," *British Journal of the History of Philosophy*.
- Frierson, P. (forthcoming) "Making Room for Children's Autonomy: Maria Montessori's case for seeing children's incapacity for autonomy as an external failing," *Journal of the Philosophy of Education*.
- Frierson, P. (2013) *Kant's Questions: What is the Human Being?* London: Routledge.
- Frierson, P. (2010) "Kantian Moral Pessimism." In *Kant's Anatomy of Evil*. Ed. S. Anderson-Gold and P. Muchnik. Cambridge: Cambridge University Press.
- Greene, J. (2007) "The Secret Joke of Kant's Soul," in *Moral Psychology, v. 3: The Neuroscience of Morality*. Ed. W. Sinnott-Armstrong. Cambridge, MA: MIT Press.
- Greene, J. (2013) *Moral Tribes*. New York: Penguin.
- Gould, S. J. (1996) *The Mismeasure of Man*, New York: W.W. Norton and Co.
- Hanley, Ryan. "Rousseau's Virtue Epistemology." *Journal of the History of Philosophy* 50:239-63.

- Harman, G. (2000) *Explaining Value and Other Essays in Moral Philosophy*. Oxford: Clarendon.
- James, W. (1906) "G. Papini and the Pragmatist Movement in Italy." *The Journal of Philosophy* 3:337-341.
- James, W. (1890) *The Principles of Psychology*, volume 1. New York: Henry Holt & Co., reprinted in 1950 by Dover Publishing.
- Kamtekar, Rachana. 2003. "Situationism and Virtue Ethics on the Content of Our Character." *Ethics* 114:458-91.
- Kleingeld, P. (2014) "Debunking Confabulation: Emotions and the Significance of Empirical Psychology for Kant's Ethics." In *Kant on Emotions and Value*. Ed. Alix Cohen, Basingstoke: Palgrave Macmillan.
- Kohlberg, L. (1968) "The Child as Moral Philosopher." *Psychology Today* 2:24-30.
- Kramer, R. (1975). *Maria Montessori*. Chicago: University of Chicago Press.
- Kuhn, T. (1996) *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press.
- Kuhn, T. (1977) "Objectivity, Value Judgment, and Theory Choice." In *The Essential Tension*, Chicago: University of Chicago Press, pp. 320-39.
- Lama, L. (2002) "Maria Montessori nell'Italia fascista: Un compromesso fallito." *Il Risorgimento* 54:309-39.
- Lauden, L. (1984) *Science and Values: The Aims of Science and Their Role in Scientific Debate*. Berkeley: University of California Press.
- Lillard, A. (2005) *Montessori: The Science behind the Genius*. Oxford: Oxford University Press.
- Lombardo, P. (2007) *The Lucifer Effect: Understanding how good people turn evil*. New York: Random House.

- Longino, H. (1990) *Science as Social Knowledge: Values and Objectivity in Scientific Knowledge*. Princeton, NJ: Princeton University Press.
- Maccheroni, A. (1947) *A True Romance: Doctor Maria Montessori as I knew her*. Edinburgh: The Darien Press.
- Milgram, S. (1963) "Behavioral Study of Obedience," *Journal of Abnormal and Social Psychology* 67.
- Miller, C. (2013) *Moral Character: An Empirical Theory*. Oxford: Oxford University Press.
- Montessori, M. (1899) "La questione femminile e il Congresso di Londra." *Rivista di Roma* 3:854-860.
- Montessori, M. (1903) "La teoria lombrosiana e l'educazione morale." *Rivista d'Italia* 4:326-31.
- Montessori, M. (1912) *The Montessori Method*. Trans. A. George, New York: Frederick A. Stokes.
- Montessori, M. (1913) *Pedagogical Anthropology*. New York: Frederick Stokes (reprinted in 2012 by Forgotten Books).
- Montessori, M. (1955) *The Formation of Man*. Trans. A.M. Joosten, Chennai: Kalakshetra Press.
- Montessori, M. (1967) *The Discovery of the Child*. Trans. J. Costelloe. New York: Random House.
- Montessori, M. (1991) *Spontaneous Activity in Education* (reprinted as *The Advanced Montessori Method I*). Oxford: Clio Press (originally 1918).
- Montessori, M. (1992) *Education and Peace*. Oxford: Clio Press (originally 1949).
- Montessori, M. (1995) *The Absorbent Mind*. New York: Henry Holt and Co. (originally 1949).
- Montessori, M. (1996) *The Secret of Childhood*. Hyderabad: Orient Longman (originally 1936).

- Montessori, M. (1997) *The California Lectures of Maria Montessori, 1915*. ed. R. Buckenmeyer.
Oxford: Clio (originally delivered in 1915).
- Montessori, M. (2013) *The 1913 Rome Lectures: First International Training Course*.
Amsterdam: Montessori-Pierson Publishing.
- Montessori, M. Jr. (1976/1992) *Education for Human Development*. Amsterdam: Montessori-Pierson Publishing. (1976 edition by New York: Schocken Books)
- Moretti, E. (2011) "Recasting *Il Metodo*: Maria Montessori and Early Childhood Education in Italy (1909-1926)." *Cromohs* 16:1-18.
- Plamenatz, J. "Rousseau: The Education of Emile." *Journal of the Philosophy of Education* 6:176-92.
- Santucci, A. (1963) *Il pragmatismo in Italia*. Bologna: Il Mulino.
- Schwegman, M. (1999) *Maria Montessori*. Bologna: Il Mulino.
- Sergi, G. (1881) *Teoria fisiologica della percezione: Introduzione alla studio della psicologia*.
Milan: Dumolard.
- Standing, E. M. (1984) *Maria Montessori: Her life and work*. New York: Penguin.
- Trabalzini, P. (2003) *Maria Montessori da Il Methodo a La scoperta del bambino*. Rome: Aracne.
- Trabalzini, P. (2011) "Maria Montessori through the Seasons of the Method." *The NAMTA Journal* 36:1-218.
- Wilson, C. (1985) "Montessori was a theosophist." *History of Education Society Bulletin* 36:52-4.