

Chapter 9

Psychology, Psychiatry and Neuroscience in Education

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Keywords

Behaviourism
Developmental psychology
Gender
Psychiatry
Psychology
Neuroscience
Norms
Special Education

Hook

Do you have a high IQ? Are you people smart or need to improve on your emotional intelligence? What is your preferred learning style? What about your self-esteem? Are you someone who feels emotions intensely or tends to act impulsively or lose control? Do you have a good self-awareness of how you feel and think? Do you know how to motivate yourself? Do you know how best to learn? Do you ever reflect on why we are asked questions such as this and what informs them?

Introduction

Psychology in particular has been highly influential in educational practice (Nisbet, 2005). It is part of teacher preparation curriculum all over the world offering ways to understand and facilitate diverse students' learning. Psychology also infiltrates other, if not all, areas of preschool, school and university life whether we recognize it or not (Petersen & Millei, 2015). If we are asked to talk about ourselves or evaluate our learning and progress in school, we use psychological concepts and vocabularies to do so. Teachers do the same when

they assess learners in their classrooms or reflect on their work. Memory, learning style, personality, perseverance, motivation, self-esteem and so on are terms that originate in behaviorist, cognitive, developmental, personality or motivation theories, such as we see them in the questions in the box above. These theories offer meaningful and common sense knowledge of mental processes and emotions, persons and their behavior, and interpretations of experience. We understand ourselves according to these theories, and they provide answers about how to improve ourselves or change, for example to enhance our intelligence and memory, to change our self-concept, to self-regulate our behavior, or to control our anger or stress. Insights about our psyche, our deepest thoughts, fears and pleasures, our self-knowledge and ideals are all mapped out in psychological terms and explanations that we rely on in our everyday and school life.

Psychology and medicine depict the competencies and characteristics of healthy individuals and also propose diagnoses and therapy for those who deviate from these norms. Special education is an applied field of psychological and medical knowledge that considers difference. Professionals, including teachers and parents, assess, diagnose and treat children following the medical model. In many cases they also administer drugs, so they can better fit children with difference to learning environments that are set up for 'normal' children. We place the concept of normal between parenthesis with an intention to signal that what is normal is not so straightforward. Later we will explain that what usually is considered normal is not natural or given rather it is historically, politically, economically and socially constructed and in this construction psychological, psychiatric and other related scientific knowledge take a great part.

Recently visualizations of brain activities and its biological processes have added new representations and imaginaries about our inner workings. These imaginaries are highly utilized in education and link emotions, heredity, mental states and physiological activities to

psychological interpretations of personal competencies, behavior and learning. They add different understandings and possibilities to control these mechanisms by drawing on the newest scientific explorations of the brain, biomolecular processes and genetics. These are developments that excite many policy makers and professionals, but they are not beyond critique and not without possible negative effects as we discuss below.

Psychology, psychiatry and neuroscience supply scientific bodies of knowledge to professionals and enable to better understanding their learners, learning processes and its difficulties. These understandings are expressed in actions, in professional practice. These bodies of knowledge are entangled in education and in various ways they supplement but also compete with each other. This chapter sets out to critically explore the various ways in which psychology (in particular developmental psychology), special education (informed by the medical approach of psychiatry), and brain research discoveries operate in educational institutions.

Psychological knowledge in our everyday life

Today it is taken for granted to think of people as individuals. However, this was not always the case. Before the 18th century only royalties were considered as individualities who earned personalized attention by birth. The emerging human sciences, such as psychology which was established during the 19th century, took an interest in the individual and generalized this conceptual framework for the whole population, everyone, not only royalties, became an individual and understood themselves as such (Tait, 2001). The aim was to provide more and more accurate description of persons by depicting the individual's functioning, learning, development, memory, feelings and so on.

These descriptions led to the invention of norms. However, those who invented norms did not call them their invention, rather they argued for them as positive facts in society, as

natural phenomena. “Between 1759, when the word ‘normal’ appeared, and 1834 when the word ‘normalized’ appeared, a normative class had won the power to identify ... the function of social norms whose content is determined, with the use that that class made of them “ (Canguilhem, [1966] 1991, p. 246). In other words, norms did not always exist. Rather, they are relatively new inventions that serve the ruling ideologies of times. Norms are used to prescribe desirable relations between people and to lay down human growth in particular terms.

Norms came in handy. They allowed us to make comparisons, graphs and metrics that provided the bases for chronicling normal development and behaviour. Norms also opened ways for the normalization of population, to make them adhere to certain norms. This happened not by directly controlling forcing people but more subtly by setting down standards of normality of which people willingly follow (Walkerdine, 1984, Burman, 1994). People were now able to measure themselves and others against these norms and enforce normal behaviour.. People became invested in these norms and they were tied with values. To be normal was to be healthy and good, to be abnormal was to be sick, deficient or delinquent. Education, as a civilising project, became a central agent in upholding or bringing about normal states. The assumption was and is that by knowing human behaviour and psyche in general and assessing the individual in relation to these, one could develop practices to transform, improve or correct individuals to adhere to these norms. Therefore the emerging educational sciences gladly utilized these bodies of knowledge that set down norms. They also utilised individual’s desires for normality. In sum, education became closely intertwined with psychological knowledge in the process of transforming the developing individual to fit the order of society, the norms upheld by ideologies of times. Davies (1995, p. 23) in her book title *Enforcing Normalcy* explains further:

We live in a world of norms. Each of us endeavors to be normal or else deliberately tries to avoid that state. We consider what the average person does, thinks, earns, or

consumes. We rank our intelligence, our cholesterol level, our weight, height, sex drive, bodily dimensions along some conceptual line from subnormal to above-average. We consume a minimum daily balance of vitamins and nutrients based on what an average human should consume. Our children are ranked in school and tested to determine where they fit into a normal curve of learning, of intelligence. Doctors measure and weigh them to see if they are above or below average on the height and weight curves. There is probably no area of contemporary life in which some idea of a norm, mean, or average has not been calculated.

The establishing of norms was tied to the identification of deviance, the 'abnormal'. As Tomlinson (1982) explains, there were only two identifications before 1890s for 'abnormal' mental competency, the idiot and the imbecile. The number of identifications has exponentially grown since that time, currently reaching more than 300, each with its own distinct diagnosis, prognosis and educational implications (Tait, 2001). Clinics and classrooms became therapeutic sites where professionals cater for those children who are marked by these diagnoses. Applying psychological, psychiatric, counselling, child welfare, paediatric, neuroscience and pharmacological knowledge, teachers have been recruited into the on-going management of 'deviant' or 'abnormal students'.

Psychology is "a way of making visible and intelligible certain features of persons, their conducts, and their relations with one another" (Rose, 1999, p. 11). Psychologists have provided the vocabularies and imaginaries, with which the types, growing, learning and troubles of children can be described. They have provided the expertise for diagnosing and categorizing children, and also shaped the languages within which the tasks of educators, mothers and fathers have been depicted and normalised. Psychology eagerly lent "its vocabularies, explanations, and types of judgement to other professional groups", such as educators, to understand and regulate childhood (Rose, 1996, p. 33-34). It also provided frames to understand educators' work. We, as subjects of psychology – children, parents, teachers and other kinds of professionals - have also played our part in its dissemination as it provides 'practicable recipes for action' (ibid.). An important point here is of course, that psychological vocabularies are operative in the self-understanding and management of

everyone.. It has come to be the case that it ‘makes sense’ to use psychology’s terms and recipes for action and also that doing so makes us feel competent and justified in our actions.

Ask yourself:

1. Have you thought about what it means to know yourself and others as a growing person or learner?
2. Have you noticed yourself using psychological terms to characterise yourself and others? Or to explain your own behaviour and the behaviour of others?
3. How do you see psychological ways of viewing the world as part of your everyday life?

Developmental psychology in education

Psychology and developmental psychology had and still have an enormous impact on how children’s growth, beings, doings, qualities and formation are understood in early childhood education and education (Cannella, 1997). These fields are in a way “the applied side[s] of the basic science of child development” (Silin, 1987, p. 21). Others argue, that their relationship is even stronger and developmental psychology and education form a reciprocal relationship. In this way, first, education has contributed to the further growth of child development approaches by offering groups of child subjects to study, and in turn, the results of these studies have further influenced pedagogies (Fendler, 2001; Walkerdine, 1984). Second, pedagogical practices and their assumptions about learning and teaching are based on, validated by and authorized by child development thinking, which is deployed as truth (Fendler, 2001, p.125; Walkerdine, 1984).

The aim of schooling is understood to be about facilitating a child’s progress understood in terms of child development psychology. To do that schooling produces practices and devices (record cards, tests, observation, portfolio, educational science, teacher training and so forth) that enable the monitoring and facilitation of children’s development. At the same time, these practices and devices assemble to forms of pedagogy (Walkerdine, 1984), such as developmentally appropriate practice or constructivist pedagogy. Child development knowledge thus promotes particular pedagogical approaches and at the same time it is

“internally related to shifts and transformations in pedagogic practice” (Walkerdine, 1984, p.163). For example, child-centered education has contributed to the development of new knowledge about children’s competencies, which knowledge in turn feeds back to pedagogical work. Working in tandem, developmental psychology and pedagogy form a couplet, and provide techniques of social regulation to raise desirable individuals / adults for society. Scientific knowledge lays the foundation for how these individuals should be, becomes and act, and pedagogy offers ways to shape these persons and their behaviours, thoughts, and feelings.

For instance, the two major researchers of the psychological tradition known as behaviourism, Skinner and Watson, believed that learning is affected by changes in the environment (Skinner, 1968). They sought to prove that behaviour could be predicted and controlled by carefully managing environmental stimuli. This way of thinking about learning disregards human thought since the mind, behaviourists argued, is a hypothetical construct for the existence of which we can find little evidence. As a form of pedagogy, the behaviourist approach breaks down the curriculum into small teachable and practicable chunks and manipulates the environment to offer consequences that children can learn from, including reinforcements and rewards, which is believed to lead to learning.

From the 1960s, the image of the competent infant began to compete with the behaviourist notion of the (empty) child. According to cognitive psychology, the child is equipped from birth to acquire sophisticated mental skills. As Stone et al. (1973, p. 4) expressed: “... every infant is an active, perceiving, learning and information-organising individual”. It is interesting to note here that cognitive psychology paralleled the development of computer technology, which provided metaphors to understand human mental functioning. Piaget’s constructivist theory of cognitive development suggests that humans are unable to directly understand and use information that are available to them in

their environment. They need to 'construct' their own knowledge through the processing of prior personal experiences that enable them to create mental images. Piaget's (1977) focus was on human thoughts and the mind's work in problem solving, the most important aspect of human experience. He argued there is gradual development in the mental structures that underlie this activity. Behind this gradual development are shifts in the method of processing personal experiences that are expressed in two major elements: 'ages' and 'stages' according to which it is possible to predict what children can and cannot understand at different ages. The role of the teacher, following this theory, is to motivate the children to create their own knowledge through processing their personal experiences. The observation of mental states, for example when the child is experiencing 'disequilibrium' or momentary confusion due to the fact that her mental schema does not fit with the reality explored, 'check lists' for milestones signalling developmental leaps, and developmentally appropriate experiences assemble to a cognitivist pedagogical approach. These examples, behaviourist and cognitivist understanding of the learner and pedagogy, demonstrate the ways in which developmental psychology and pedagogy are intimately interrelated.

Ask yourself:

1. What does it mean to relate, to teach, and to learn on psychological terms?
2. What is it possible to be and become as persons in educational institutions that are permeated by psychological thought?
3. How do we make sense and what are the effects of particular ways of making sense?

Psychology and developmental psychology construct human learning and growth through imaginaries that are taken as true and universally applicable scientific facts, such as the mental schemas or ages and stages discussed above (Fendler, 2001, p. 125). These imaginaries are underpinned by at least three beliefs: first, the belief in human progress; second, the belief that all human beings grow and develop in a predetermined manner; and third, the acceptance that child development 'uncovers' a universal human truth (that always

existed, we just need observant researchers to uncover it) that can be applied to all (Cannella, 1997). We explain these points here in more detail.

First, progress means that children are moving ahead from a lower level of competency to higher levels of achievement on trajectories that are marked out as desirable in societies, for example, to advance from dependence to independence, from being irrational to rational, and being irresponsible to responsible. Relatedly and as the second point, mapping independence on a trajectory following a given manner enables the facilitation of this competency from dependent newborn to independent adults, where independency is a highly valued aspect of a person in Western society (in which these theories were formulated). Third, the characteristic and trajectory of independence, then, is believed to be true for each individual no matter whether one lives in South Africa or Australia, in a city, on a farm, in war, or in a century past. This is the universalistic characteristic of development.

Developmental psychology is “premised on a set of claims to truth which are historically specific, and which are not the only or necessary way to understand children” (Walkerdine, 1984, p. 154). Read the following historical quote from 1896 that demonstrates that children were considered closer to nature, as primitive humans, on a lower rung of the developmental ladder of progress. While these words seem absurd today, their underpinning image is continuous and, while perhaps not dominant, still identifiable today:

The first years of a child, with their imperfect verbal expression, their crude fanciful ideas, their seizures by rage and terror, their absorption in the present moment, acquire a new and antiquarian interest. They mirror for us, in a diminished distorted reflection no doubt, the probable condition of primitive man. The intellectual and moral resemblances between the lowest existing races of mankind and children are numerous and close (Sully, 1896, pp. 8–9 cited in Varga, 2011).

Since those times anthropologists have provided bountiful evidence on how universalist Western developmental norms established by white male professors in relation to white middle class and mostly male children (Burman, 1994) are not applicable in different cultural

contexts (Rogoff, 2003). For example, a wonderfully filmed documentary by Thomas Balmès (2010) titled *Babies* shows the different circumstances and competencies of children in four very different cultural contexts (Namibia, Mongolia, Japan, US) which demonstrates the unsustainability of universal developmental claims. Yet these social constructions, norms and expectations continue to guide our understandings and hence our pedagogical practices.

Cannella (1997) warns us that the norm-laden psychological constructions that dominate our meaning-making practices often remain unrecognized and unchallenged. As such they create an environment for young human beings that is unjust and even hostile to particular groups. The construction of development hierarchies entails that those who are deemed at the endpoint of the trajectory are seen as functioning at higher levels and, as a consequence, able and entitled to study and judge others at a lower level. Piagetian thinking, for example, constructs the adult as the rational being, bearer of logical thinking, and situates the child at the margins or as inferior, where children's knowledge about the world, therefore, can be easily and justifiably ignored and denied as being not rational. The developmental trajectory marks out a path that everyone needs to progress on and those who do not fit these norms are understood as deficient and then regulated toward avenues that lead to the fulfilment of developmental expectations.

Mainstream child developmental psychology creates hierarchies, where some individuals are positioned at the bottom, as less complete, or as a shadow of their future. These hierarchies are produced in line with dominant social ideologies, such as childism, racism, male chauvinism, neoliberalism, capitalism and so on, that determines who is desirable in a society. Groups that are positioned on the lower rang are often those of young children, females, migrants or people of colour. Young children, however, did not create or choose these developmental norms, nor the social ideologies that justify their existence, and in that

sense “living within our values, younger human beings are limited to the possibilities that fit our constructions of them” (Cannella, 1997, p. 64).

Theory-practice in Action

Read the following observation note and questions (adopted from Walkerdine (1990, p. 4))

Annie takes a piece of Lego to add on to a construction she is building. Terry tries to take it away from her to use himself, and she resists. He says:

Terry: You're a stupid c__t, Annie.

The teacher tells him to stop and Sean tries to mess up another child's construction. The teacher tells him to stop. Then Sean says:

Sean: Get out of it Miss Baxter paxter

Terry: Get out of it knickers Miss Baxter

Sean: Get out of it Miss Baxter paxter.

Terry: Get out of it Miss Baxter the knickers paxter knickers, bum.

Sean: Knickers, s__t, bum.

Miss B: Sean, that's enough, you're being silly.

Sean: Miss Baxter, knickers, show your knickers.

Terry: Miss Baxter, show your bum off. (they giggle)

Miss B: I think you're being very silly.

Terry: S__t Miss Baxter, s__t Miss Baxter.

Sean: Miss Baxter, show your knickers your bum off.

Sean: Take all your clothes off, your bra off.

Terry: Yeah, and take your bum off, take your wee -wee off, take your clothes off, your mouth off.

Sean: Take your teeth out, take your head off, take your hair off, take your bum off. Miss Baxter the paxter knickers taxter.

Miss B: Sean, go and find something else to do please.

Questions:

1. Does this interaction shock you?
2. Do you want to know how old Sean and Terry are? Why? If you knew their age, what sense do you think you would make of their behaviour and statements? Would age matter in your assessment of what kind of children Sean and Terry are?
3. In what way would it be possible to see Sean and Terry as competent – what are they good at?

Reflection: The developmental understanding creates an image of children as asexual, innocent and busily engaged in their world, and as being unaware of the power relations of a patriarchal society. Yet, if we were to suspend that form of thinking what other ways could we read this observation? Could we see the gendered interactions of the boys, showing how they exercise sexist interactions with their female teacher? Another interpretation could be that they are 'bad boys' and or 'naughty' and that they are naughty because they are under-challenged and misunderstood in the classroom. More readings are of course possible and the point is to reflect on what reading *within* the grain of developmental psychology has us see and what reading *against* the grain might open up for.

Special education

Guided by developmental norms and norms of behaviour parents, teachers, and other professionals continuously engage in the examination, assessment and surveillance of children. The aim of these observations is to ascertain normal development or diagnose observed differences to norms (Rose, 1999). Most parents closely monitor their newborn's development. They purchase educational toys and participate in parenting classes to be best able to help their children learn and develop. They are worried if their children do not meet particular 'stages' at the 'right' time, such as missing crawling or being late in their language development. Teachers also assess learners' competencies and skills compared to norms and employ special tests or call upon experts when they get concerned about children's deviance from those.

With the fine-tuning and increased monitoring of developmental norms, the scientific identification of an ever-widening range of behaviour as abnormal or even pathological became possible (Rose, 1989; Slee, 1995). Against the intricate sets of criteria of normalcy and abnormalcy, children are evaluated no longer as 'lively' or 'energetic', rather they are very likely be classified as 'hyperactive' and potentially suffering from attention deficit disorder (ADD) or oppositional defiance disorder (ODD) or conduct disorder (CD). Others who were considered as 'shy' or 'quiet', today are likely to be assessed as suffering from generalised social phobia (GSP) or avoidant personality disorder (APD). They are not 'obnoxious' anymore but appraised as having antisocial personality disorder (APD) or borderline personality disorder (BPD) (Tait, 2001). With the appearance of more 'special conditions', a growing number of children are labelled with pathologizing categories such as conduct disorder, attention deficit disorder, autism, learning difficulties, and the list goes on (Billington, 1996; Tait, 2001; Allen & Harwood, 2016).

Physicians, psychologists and psychiatrists readily supply descriptions and assessments of these conditions, and offer treatment schedules and drug prescriptions. For example, the symptoms of attention deficit disorder consist of fidgeting, excitability, impulsivity, immaturity and lack of self-control. There are available therapies, including behaviour modification, counselling, cognitive therapy and social skills training and, one of the most preferred treatment, the administering of the psychotropic drug called Ritalin (Tait, 2001).

Professionals take up psychological and psychiatric diagnoses and treatments to make sense of children in their classrooms and to help their own work in the management of difference and keeping control. What is important to note here, first, is that norms are scientific constructions and only one way to understand what is happening with a child among many other possible explanations. For example, as the traditional classroom set up becomes less suited to children's worlds - more freedom, individualisation, new technologies and media, and so on -, the context of the 'traditional' classroom becomes even less conducive to their learning and more children are identified as 'suffering' from different conditions. Second, it is not that some of these 'conditions' do not exist *per se*. Our concern targets the dominant mode in which a whole range of behaviours and ways of being in the world are regarded as pathological, as a characteristic of an individual rather than as a historical and contextual phenomenon that is socially produced, as well as how they are addressed, that is, often through pharmacological drugs. Basically, students are drugged to normalcy (Tait, 2001).

Comparisons to norms and the diagnosis of difference in terms of ab/normality and deficit follow what we call the medical model. This model of diagnosis, prescription and 'clinical' intervention aim at the 'normalisation' or 'renormalisation' (cure) of selected children (Henriques *et al.*, 1984; McCallum, 1990; Rose, 1989). It is important to note that it is always deviance that is noticed and made problematic, where the norm is taken mostly as

an accepted and objective fact, which rarely if ever is questioned. However, norms are constructions and as such they are not value free. They are based on particular ideological assumptions about what is good and worthy in a society, as we showed above in relation to the irrational child. In a neoliberal society that rewards people who are outgoing, aim-orientated, productive, self-regulated, self-motivated and take lots of initiative; shy, reserved, too lively, too aimless, too unfocused or obnoxious people are considered as less desirable. They are identified and remediated to become more like the other 'normal' (read: desirable entrepreneurial) people in society.

It is not only the mind and personality that are under the scrutiny of science. The Medical model prefers the able body, while it constructs those bodies which do not meet the criteria of the normal as sick and/or deficient, that is, as pathological (Shildrick, 2005). Medical models of disability occupy an authoritative place in special education (Kearney & Kane, 2006) and help to maintain the binary of abled/disabled in educational settings. In this binary able-bodiedness remains an uncontested norm serving to define the less or not able (Smith, 2004). Physical difference to the norm constructs failing, incomplete and inferior bodies, and "marks disabled embodiment as deeply devalued, not so much for what it is but for what it fails to be" (Shildrick, 2005, p. 756). Physically disabled children are *not able* to climb steps, sit still and so on. Moreover, in medical, psychiatric and psychological knowledge the perspectives and experiences of people who are marked as 'not normal' are mostly missing. They are simply considered as objects of the scientific gaze and targets of intervention. While this situation is changing in special education, children with special needs are still considered dominantly as less able to express what is going on with them and to voice their wishes and needs, if at all (Watson, 2015). Others, the able-bodied and minded, usually know better what is best for them.

Task

Accompany a person who is in a wheelchair or is blind for a day, or sit in the wheelchair or blind yourself for a day and try to get around. Make note of the difficulties you encounter. Alternatively, interview a person in a wheelchair or a blind person or volunteer in a school specifically designed for the blind. What do you notice?

The startling difference between the official and medical view of a child is well transposed in the following quotes. The first quote is from a medical association and the second quote is from Donna, who is labelled as 'autistic' in the medical model (Billington, 2006, p. 2-3):

Professional voices

Marked impairments in the use of multiple, non-verbal behaviours such as eye-to-eye gaze, facial expression, body postures and gestures to regulate social interaction ... failure to develop peer relationships appropriate to developmental level ... a lack of spontaneous seeking to share enjoyment, interests or achievements ... lack of social or emotional reciprocity. (American Psychiatric Association, 1994, DSM IV)

Donna

The more I became aware of the world around me, the more I became afraid ... I was frightened ... My world was full of imaginary friends. They were far more magical, reliable, predictable and real than other children ... Other people did not understand the symbolism I used ... Trish cuddled me ... I was terrified. It seemed tears were welling up from a part of me long buried and forgotten ... I always paid for closeness with fear. (Donna Williams, 1992)

While the quotes may present a false dichotomy, the first one, as argued before, remains the authoritative and pervasive perspective in current professional practice. Sophisticated theories, for example, theory of mind, executive function or sensory integration theories inform professionals' perspectives and actions that have little to do with who the specific child diagnosed is. The scientific language and perspective dominated by symptoms leaves no room to see the person for whom she is and her experiences for what they are. Too often the label even takes away any chance of considering the child as a person (Watson, 2015). She becomes the child with autism or, even, 'the autistic one', removing her humanity and the chance for her to participate fully in everyday classroom life. She becomes the object of

concern and special care, and Donna, the unique person with desires, wishes, dreams, experiences and ideas, disappears.

Billington (2000) calls upon professionals to surpass adhering to mechanical traits of diagnostic criteria and understanding. He advocates for avoiding the medical view because it isolates the child and places the responsibility for change on the individual child with the special need. Changing the approaches of adults, to avoid the medical view and see the child differently, as a person who understands and accommodates to our world in a different manner, or to change the environment so the child would not be hindered by it, are rarely if ever considered as options in schools. Billington (2006, p. 11) sees the possibility of relating differently to children with special needs and creating other kinds of inclusive environments, by accessing the “views of autistic children in order to identify the ways in which they currently manage their ‘worlds’”.

Ask yourself

1. Have you considered what psychiatric or psychological labels do in your work or in your everyday life?
2. Have you noticed your own way of regarding someone changes as a result of learning their diagnosis?
3. How would you relate to Donna if you did not know her diagnosis or if you consciously chose to disregard her diagnosis?
4. Do you think Donna’s view of herself changed upon receiving the diagnosis? Would you ask her about that?

The DSM IV quote given above describes autism as an objective scientific fact. The language used in the quote has an authoritative tone and the words read as objective statements about reality that are independent of any observers and their subjective or biased views. Veiled in this kind of language of objectivity, scientific descriptions and explanations are construed as value free and unbiased. However, they are always based on a privileged point of view and they have implications which will advantage some and disadvantage others. At the same time as seemingly objectively describing an assumed condition, they

create the very condition. This creation enables them to diagnose the condition and as a result marginalise groups of people who are deemed deviant in relation to this creation.

In this way, the management of particular groups of people becomes possible: they are diagnosed and treated according to certain psychological and medical regimes. How else could it be that the risk of diagnosis is higher in particular segments of the population, based on race, class and gender (Harwood & Allen, 2014)? Harwood & Allen (2014) demonstrate this with reference to a large body of statistics in four contexts. For example, rates of diagnoses of ADHD among Indigenous children from the Brazilian Amazon are cited as 24.5 per cent. In the UK, almost 40 per cent of black Caribbean children are diagnosed as having special education needs. These levels of diagnosis are two and three times higher than what occur in other groups of people. Children and young people living in poorer circumstances are four times more likely to be diagnosed with borderline to abnormal social, emotional or behavioural difficulties and have increased likelihood of school suspension and exclusion and be connected with high rates of behaviour disorders and medication (Harwood & Allan, 2014). Patterns of higher diagnostic rates in low socio-economic areas are also evident in Australia, a country which has rates of diagnosis of 11.2 per cent and which has the third highest use of stimulant medication for ADHD after the US and Canada. This means that at least every 10th child is diagnosed with this condition and many of them treated with drugs from an early age.

Gender plays another important influence on diagnosis and referrals to experts. Boys outnumber girls in diagnoses of ADHD by three to one. There is also a referral bias, whereby boys are more frequently referred than girls because of their supposedly aggressive behaviour, which takes the ratio of boys to girls within mental health clinics or hospitals to between six and nine to one (Cantwell, 1996). The risk of diagnosis fluctuates but is linked to race, class and gender in different cultures. Differential risk of diagnosis rates may reflect

different levels of tolerance within cultures for particular symptoms that are associated with assumed cultural mores in certain groups (Harwood & Allan, 2014). For example, Australian Indigenous children are thought to being more disruptive or less accustomed to ‘Western’ schooling practices (a racist claim at its core). The differential levels of diagnosis might also reflect parental perceptions of what constitutes ‘normal’ behavior in different cultures. Thus, parental tolerance signals what is expected or advantageous in a culture and demonstrates the role of social regulation of particular children through diagnosis and treatment.

The medical model of special education raises some important ethical questions and complex issues for schools and professionals. First, special education can operate as a form of management of particular ‘less desirable’ groups in societies. Second, as discussed before, children with a difference are often identified by their diagnosis, for example the ‘autistic child’, which precludes other ways of identifying and engaging with the child. A third point, and relatedly, is that the behavior of those children who are diagnosed with a condition is more likely to be read within the lexicon of symptoms associated with the disorder and explained as being the function of the condition (Billington, 2001). For example, if a child with ADHD constantly moves his or her body it will be read as ‘fidgeting’ or ‘hyperactivity’, and it will be explained with reference to the symptoms of ADHD. In other words, it does not become possible to read the ‘fidgeting’ as the child’s free will to behave that way, or as a deliberate response to particular circumstances, rather it is happening involuntarily due to the child’s condition. As a passive being the child just acts out its ‘sickness’ in a decontextualized way. To think further about the ethical implications of diagnosis and the medical model, read the following two examples and consider the ethical implications by trying to answer the questions.

Theory-practice in Action

A pupil in Tennessee who has been previously diagnosed with ADHD kicked a water pipe in a school lavatory until it burst, an act for which he was suspended for three days. At a school hearing into the matter, the student's psychologist testified that the act of vandalism 'was a manifestation of [the] disability'. The principal argued that while this may have been true of the vandalism, the incident itself occurred in an area of the school the student had been forbidden to enter, and therefore this was not a matter of disability but rather of discipline. With the student facing categorization as delinquent, the matter eventually ended up in court, where the student won. In a matter that had the potential to go all the way to the Congress, the school district has been forced to appeal the decision, the decision it contends 'has made schools a 'lawless zone' for students with disabilities (Zirkel, 1995 cited in Tait, 2003, p. 430).

A pupil in Wisconsin was one of three who vandalized two elementary schools causing \$40,000 worth of damage. His school thought to expel him along with the two others who caused the damage. During the hearing into his actions, his mother raised the possibility that he might have ADHD, and soon acquired a private psychologist who concurred with this appraisal, even though the school district's psychologist disagreed. Again, the matter ended up in court, with the student winning his case and avoiding expulsion as a disabled student – unlike his co-vandals who only escaped expulsion by withdrawing from the school. As the school district attorney pointed out, the admission of such post-hoc diagnoses is both 'disturbing and mysterious', and adversely affects the school's ability to discipline not only students with disabilities, but also those who may then choose to claim them (Zirkel, 2001 cited in Tait, 2003, p. 430)

Questions:

1. What do you think about these two scenarios?
2. Are the students responsible for the acts they have committed, and which students and how?
3. Are they punishable and to what extent and how?
4. What are the implications for the school's ability to exercise authority over students?
5. What are the implications for teachers' ability to manage their classrooms?
6. In what way do cases such as these enable us to see psychiatric diagnoses not as objective and neutral but as political that aim to control particular children?

Education and the neurosciences

New forms of biological and neurological thinking have entered the evidence base of education during the past two decades. This body of knowledge direct our attention to the possibility of directing biological life purposefully (Mansfield & Guthman, 2015, p. 12).

Neuroscience and brain research enjoy a high status not only among the medical fields and in academic research but also in the applied disciplines that have begun to draw on the knowledge they provide, such as education, psychology, special education, counselling and so on. Neuroscience, like the medical science we discussed above, is proffered to be objective and value free and it is often supplemented with colourful images representing the

functioning of the brain. They are backed up with evidence supplied from the most prestigious laboratories around the world. The terminology of neuroscience seems to be difficult, inaccessible, or intimidating for many, lending even greater authority to its claims. In this way, neuroscience's claims to truth about the mental world of people are hard to contest. The limited critiques available mostly address first, the ways in which this evidence is produced, and second, how the evidence is used and for what purposes.

First, critics within the field of neuroscience itself have challenged the ways in which evidence is produced, that is, the gathering and interpretation of scientific data that is available through neurological experiments (for a comprehensive review see Duncan & Magnuson, 2013). They argue, for example, that based on experiments conducted with mice, neuroscience makes wide sweeping generalizations about human brain functioning that are highly problematic. Therefore, neuroscientific evidence and claims need to be carefully adopted as only few conclusions actually hold up (Duncan & Magnuson, 2013). Second, professionals, policy-makers and politicians use neuroscientific evidence in a simplistic way to help meet their political or institutional objectives. Their simplification usually means that they use neuroscientific knowledge incorrectly or misinterpret its claims. This kind of simplified use of evidence employs a linear causality – if 'a' occurs then 'b' follows, which disregards both context and complexity. Since real life situations cannot be mimicked in simplified laboratory experiments (often with mice or other animals), authoritative and final knowledge of how the human brain functions is still a way off (MacNaughton, 2004).

To illustrate neuroscience reasoning, read the following statement that often appears in developmental textbooks: *It is often assumed and even pronounced that optimum brain development ensured by the most favorable physical and personal environment results in productive and healthy adulthood.* We find the statement problematic for several reasons. First, in this statement the causality that is set up stretches many decades in a person's life.

Second, many factors shaping this person's life are left uncharted, such as economic, social and political circumstances. Third, this argument also implies that if optimal brain development is not ensured, the person is already lost, or her/his future is lost and/or she/he will be a burden on society. This is what critics call a deterministic view. Fourth, the statement implies that only those humans that are useful for societies, those who are productive and healthy, are desirable. Therefore, interventions into individuals' lives to optimize brain development become easily justified and legitimated. Moreover, that certain people who lack 'optimum brains' are a loss for society, hence its fatalistic thinking. In sum, this kind of arguments delivered by neuroscience seamlessly work together with those that aim at the management of the population that psychology, psychiatry and special education instituted.

Neuroscientific knowledge also opened possibilities to think about the child, the subject of education and care, and contour the knowledge base, philosophies, and practices of education in new ways. Psychological theories describe the individual as a bounded entity, for example a collection of behaviours, such as in behaviourism, or an operating mind that organises knowledge, such as in cognitivist theory. Psychological knowledge is used in pedagogy with the aim to develop or alter certain behaviours, aptitudes and mental functions of the individual. Neurosciences use and expand this knowledge about the person to the internal biological processes of the body. They help to make visible and map the biological mechanisms of the body for management and control. Whereas before aptitudes or competencies were attributed to the individual's abilities, as personal characteristics, it is now possible to conceive them based on new neurological evidence as a particular operation of the human brain, where the brain is equalled with the human mind (Rose & Abi-Rached, 2013). Researchers are becoming more and more successful in mapping areas of the brain to these aptitudes and competencies or link those to particular genes, this way establishing heredity or

enabling to target these potentials by training or pharmaceutical drugs and opening avenues for engineering particular desirable humans (Rose & Ani-Rached, 2013).

Neurosciences and biosciences go beyond (or under) bodily borders and open new spaces for intervention that are located under the skin of the individual, their neural and biomolecular functions. In this way, as Lemke states (2005, p. 5): “[f]or the first time, it is on the level of instruction that metabolic processes are becoming susceptible to manipulation. Until that point was reached, medical intervention, even in its most intrusive physical, chemical and pharmacological forms, was restricted to the level of metabolic performance”. In other words, it is no longer about taking Ritalin and making the child less ‘agitated’, it is about preventing the ‘condition’ by entering into and reprogramming the child’s mind. Neurosciences and biosciences thus radically alter intervention by reshaping the idea or image of the human as a purely biological creature, and by adjusting what nature has created. In this way, the purpose of education becomes the alteration of metabolic processes (for example the use of neuro-hormones that enable better concentration) and or about scheduling exercises targeting particular parts of the brain. This new knowledge base radically alters what education and teaching is or should be about and also reshapes what knowledge teachers need and what kind of interventions they aim to or should make in children’s lives.

Just as psychology did in the course of the twentieth century, neurosciences, biomedicine and biosciences form a “new regime of truth about our nature as human beings” (Rose & Abi-Rached, 2013, p. 227). In a similar manner as psychology marginalized some groups of people by labeling them as abnormal matched against some ideologically defined norms, neuro- and biosciences reconfigure what is to be considered as a healthy brain and individual. For example, living in poverty gains a double meaning and explanation in neuroscience arguments. First, this state of existence is explained as a result of poor brain development, and second, poor brain development is expounded as the result of poor parenting that occur

because of the financial and existential stress people experience living in poverty. A societal problem, poverty, is explained in individual or in neurological terms that necessitates interventions at the neurological level replacing those that existed earlier, such as different welfare distribution and early intervention measures, such as through parenting or preschool education.

Child development and educational psychology textbooks, as well as the new neuro-education movement and mindfulness training, utilize the idea of brain plasticity. The concept of neuroplasticity introduced the dimension and importance of time in brain development extending from fertilization through the following decades of life. During this period, the brain is open to environmental damage and manipulation, such as lack of activation on the one hand or neuro-pedagogies on the other. Neuroplasticity replaces or competes with ideas that argue about the structural limitations of the brain due to heredity. Neuroplasticity contests the idea that only genes that program and direct development and considers the environment as equally important. Notions of synaptic connection formation and loss, and rewiring of the brain, have produced a new truth and previously unknown potentials for the early and later periods of life.

For example, it is argued in a child development textbook that “neurons that are seldom stimulated soon lose their synapses, in a process called synaptic pruning that returns neurons not needed at the moment to an uncommitted state so they can support future development. In all, about 40 percent of synapses are pruned during childhood and adolescence ... appropriate stimulation of the child’s brain is vital during periods in which the formation of synapses is at its peak” (Berk & Meyers, 2016, p. 162). This seems to suggest that by creating stimulating environments the brain’s capacity could be increased. Neurogenesis also proved this link by providing evidence about the production of nerve cells after the first year of life as an effect of environmental experiences, which earlier was considered impossible (Ming & Song,

2011). As a consequence of this thinking, intrauterine and early childhood experiences are considered fundamentally life shaping that can make or break an individual (deterministic and fatalistic thinking).

These arguments have profound effects on how we understand the child and learner in education. The biology, genetics and plasticity of the human brain represent the human, the 'raw material' of education. This image of the human and the 'correct nurturing practices' then is linked to the vitality of the nation in the future. Those who have immediate influence on healthy pregnancies and optimal brain stimulation during the earliest days and months, families but mostly mothers become the protagonists of this vision (Edwards et al, 2013). As so aptly explained by Edwards and her colleagues (2013, p. 5), through their examination of prenatal courses and parenting education, relationships are also reformulated on biological grounds:

[p]regnant women and new mothers are the explicit targets, reflecting the resurgence of old and highly contentious tenets of attachment theory. ... The quality of care is claimed to be reflected in the anatomical structure of the child's neural circuits with sensitive mothers producing 'more richly networked brains'.

On biological terms, neuroscience knowledge also helps to recode sociality and social relations. It is argued that early social relations, including most importantly pre- and post-natal relationships, are coded in genetics. This argument is based on epigenetic research findings on rat mothers that engage in high or low amounts of licking/grooming and arched-back nursing of their pups. These findings are extended as an explanatory framework for human mothering behaviour also. In genes, assumedly, these codes are passed on to next generations (Fish, Shahrokh, Bagot, Caldji, Bredy, Szyf & Meaney, 2004). In other words, if one receives good mothering this will be stored in one's genes, which are then passed on to the next generation and therefore the offspring will be also good parents.

¹ Popularized for example in <http://discovermagazine.com/2013/may/13-grandmas-experiences-leave-epigenetic-mark-on-your-genes>

It is also argued that genetic coding enables the capacity for living in groups.

Consequently, it is put forward as advice based on these findings that parents should understand that their earliest interactions have ramifications also for next generations and the kind of society to come. Adopting this kind of epigenetic research to parenting, it is promoted that parents should learn to understand their own minds, including their empathy, emotionality, fairness and commitment to others in order to pass 'optimal' relations down to the next generations and consequently to maximize the potential of the next generation's mental capital and to ensure the moral order of society as a whole (Rose & Abi-Rached, 2013). In all these discourses what needs to be observed is that the harsher consequences or more deterministic evidence they provide, the stronger control they hold over and the larger responsibility they place on parents' behaviour.

The suggested kind of parenting requires particular forms of self-awareness and this marks out an important point where neuroscience and epigenetic evidence meets with psychological knowledge and practices. Since the process of 'hardwiring the brain' (note its link to cognitive psychology and the similarity drawn between humans and computers) is hypothesized to be finished by three years of age, there is a need for very early 'optimal care' and intervention. This thinking in turn infuses much policy and practice literature and focuses on families and most prominently early maternal care and relationships. In particular, narrow ideas about rigid 'critical' or 'sensitive windows' of development are overemphasized, where lack of a certain type of parental stimulation early on in a child's first years is posed as causing permanent stunting in many areas graphically represented by images of the 'pruned' brain, the early, unnecessary and final cut of neural connections. In sum, ideas and visual representations attached to the neuromolecular, plastic, and visible brain, provide avenues to intervene on the brain and the mind. These interventions are attached to existing forms of interventions, such as those offered by psychology, parenting and early and later education.

Ask yourself

1. How do you react if someone refers to neuroscientific research? Do you find that it brings with it a certain authority – that it is more difficult to contest that view than other views?

Conferences, popularizing presentations for educators and parents, and a growing number of books popularize neuroscience knowledge in simplistic formats. Their simplicity are apparent in statements such as “Parents want their children to have a healthy lifestyle with healthy food, exercise and a wide range of valuable experiences, but often forget that healthy neural development must take into account screen time and the impacts on the wiring of developing brains.”¹¹ Similarly, it is stated that pedagogical developments based on neuroscience offer a better utilization of the mind’s capacities. These popular pedagogies combine cognitive and positive psychology and mindful awareness with neuroscientific language (Zelazo & Lyons, 2012). These messages and their high prevalence in everyday discussions produce imaginaries of children’s brains as hard wired machines that others can fix, develop and speed up with the right techniques.

Neuroscience cannot provide instant solutions for the classroom. Therefore, applied research bridges the gap between laboratory and classroom settings (see more in Busso & Pollack, 2015). For example, neuro-education at John Hopkins University or at the University of Bristol develops new techniques to intervene in the brain in areas of learning and cognition, socio-emotional development and self-regulation, reading and mathematics, the effects of poverty, early intervention, school readiness, and teaching practices. They work on new pedagogies that are attached to existing psychological techniques, such as mindfulness training or relaxation and link those with medical technologies, such as using bio-feedback of bodily functions. For example, heart rate monitor or stress level measured on skin is utilized to initiate psychological self-control techniques, such suggestive self-instruction to decrease stress levels. In programs directly developed for the educators of young children, such as ‘brain training’ (the targeted improvement of isolated cognitive functions through practice) or

the MindUp program (brain gym combined with meditation practices) funded by The Hawa Foundationⁱⁱ, similar content is deployed to train teachers working in primary and preschool education.

To diagnose or treat children with a range of education-related difficulties, such as speech and language disorders, learning disabilities and autism, new neuro-assessors are developed to work with 'psychoeducational assessors'. Psychological measures assess a student's strengths and weaknesses in various domains, such as cognitive ability, achievement, information processing, language, attention, behavior and psychological issues, which are then mapped against neuro-images (neuro-assessors) that represent faulty brain functioning. In this way, teachers can compare the brain scans of their students to these neural images if they were concerned. This is a use of neuroimaging technology that neuro-experts have developed and other professionals can also use.

While there is an ever-growing expansion of the use of neuroscientific knowledge and technology in education, Pykett (2012) warns about the consequences of the application of this knowledge for educators' professional standing. She claims that teachers could easily become the 'mechanics of the brain'. In this way, their diagnostic, pedagogical and content expertise might turn out to be less valuable than the superior expertise of brain scientists. The interdisciplinary partnership between neuroscience and education presents new opportunities but also calls for a healthy scepticism about the direct translation of neuroscientific research to education practices. As Busso & Pollack (2015, p. 180) powerfully argue:

The neurobiological framing of education may inadvertently lead us to essentialise types of students, which may obscure complex explanations for student behaviours or downplay students' sense of agency. In turn, neurobiological framing could alter the basic values and goals that drive education, such that the current notion of brain-based teaching methods may displace or bypass, rather than integrate with, teaching methods that focus on behaviour, relationships, culture, or psychosocial factors.

As we have demonstrated, neuroscience knowledge is presented in education as exciting new knowledge that does not only revolutionize pedagogies but also offer powerful arguments for early investment in children's education and care (Millei & Joronen, 2016). However, this knowledge base is indifferent to earlier ones that drew on different psychological and medical models to manage or marginalize certain groups of children and to enroll teachers for this kind of work. The application of neuroscience knowledge continues this form of regulation and intervention by translating social troubles into neuro-, genetic or biological problems of individuals and their minds. The application of this knowledge helps to remove social responsibility and passes it on to lack of biological capacities and faulty functioning and justifies direct intervention in to human minds on those grounds.

Theory-practice in Action

Look through your education psychology or developmental psychology textbook and think about its neuroscience content with the fresh perspective we have offered here. Pay particular attention to the following:

- In what ways do you think these texts use a deterministic language and make students' faith up to their biology, if at all?
- Do you think their wording has a certain emotionality attached to it? If yes, in what ways? What do you think the function of this kind of emotionality is?
- What are the values attached to brain science?
- Do you think there is a danger in reducing the human mind to the biological functioning of the brain? What do we miss and risk if we do that?
- How do you think teachers' work might change if brain imaging and related practices become more utilized in classrooms? How might the role of the teacher change?

Conclusion

In this chapter we explored the close relationships between psychology, psychiatry, medicine and neuroscience, and education. We argued that these forms of knowledge and practice are often taken for granted or unidentified, but strongly influence the way we imagine children in schools, their competencies and skills, and the best ways to educate them, and we use them also to make sense of ourselves and the work we do as educators. The

dangers of unconsciously applying these forms of knowledge are many. As we have shown, they may make us accept certain norms and values, which marginalise and subjugate particular children, certain social groups, and also potential and alternative forms of being in the world. They make us measure and compare children in particular ways, privilege some forms of being and acting, disregard specific embodied experiences and perspectives, and often position ourselves, as adults and knowers of others, as superior in some sense. They make us accept particular bodies of knowledge as scientific facts and therefore unquestionable and more valuable than others. We also aimed to show how various norms were constructed, and how norms are not value-free but intimately intertwined with larger socio-political ideals and processes. At the end of this chapter we list some questions that you can draw on to identify and reflect on your use of psychological, psychiatric, medical and neuroscience knowledge.

Questions

1. Does the terminology I use to understand children, learners and myself actually promote the values that I hold for all human beings? Do I know what these values are?
2. What are the philosophical, political and social underpinnings of this knowledge that informs these terminologies?
3. What are the hidden messages within these assumptions, the unseen meanings that mould my image of the child, the learner and myself as a teacher?
4. What forms of power and authority are created through the application of this knowledge? How does this knowledge position the child, the learner and myself as a teacher? Who is privileged and who is silenced?
5. Does the application of this knowledge actually result in what I consider as good life for all human beings under my care?

Additional resources and readings

- Billington, T. (2006) Working with autistic children and young people: sense, experience and the challenges for services, policies and practices, *Disability & Society*, 21(1), 1-13. This article provides first hand narratives of autistic experiences where assets are discussed instead of emphasizing deficits. JA great reading that helps the reader to step into the everyday experiences of a person with autism.
- Busso, D. S. & Pollack, C. (2015) No brain left behind: consequences of neuroscience discourse for education, *Learning, Media and Technology*, 40(2), 168-186.

- This article draws attention to the current and potential implications of importing biological ideas, language and imagery into education.
- Petersen, E. & Millei, Z. (2016) *Interrupting the Psy-Disciplines in Education*. London & New York: Palgrave MacMillan.
This book offers a study into the role of the psy-disciplines (psychology, psychiatry and psycho-analysis) in the education system through vivid illustrations from throughout the educational lifespan.
- Varga, D. (2011) LOOK – NORMAL: The Colonized Child of Developmental Science. *History of Psychology*, 14(2) 137–157. link: www.apa.org/pubs/journals/features/hop-14-2-137.pdf
This article provides critically engages with the techniques, methods, materials, and discourses of child study observation that contributed greatly to the establishment of developmental norms.

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ⁱ <http://childrenandmedia.org.au/events/accm-conference>

ⁱⁱ <http://thehawnfoundation.org/mindup/>