

Ethics & the new education:  
psychopharmacology, psychometrics, & the future of human capital

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**ABSTRACT:** This paper explores the ethical impacts of standardized testing and psychopharmacology in order to diagnose the pathologies of human capital theory as an educational meta-theory. Drawing on the work of Ken Wilber and Roy Bhaskar I build an alternative integral meta-theory of education, which is deployed to reveal ethical issues involved with standardized testing infrastructures that center around a principled distinction between *efficiency oriented* testing practices and *justice oriented* ones. I argue further that the recent epidemic of psychotropic drug prescriptions for school aged children is dialectically related to the dominance of efficiency oriented testing infrastructures. Looking at the rhetoric and science surrounding the growth of educationally oriented psychopharmacology, I deploy the same meta-theoretical approach to characterize the ethical difference between *designing* children and *raising* them. I conclude with a series of provocations and reflections directed at kindling the social imagination and reviving our sense that there are alternatives to dystopian educational futures.

*Introduction: tomorrow's child*

During the first decade of the 21<sup>st</sup> Century, the world economy was set into crisis and national political discourse and policy was thrown behind the idea of continued US technological and scientific superiority, more specifically the need for comprehensive educational reform to prepare American children for the techno-scientific economy of tomorrow. This climate saw federal testing policies set so that accountability metrics dominated school cultures. Prescription drugs for academic under-performance skyrocketed. Already large financial inequalities between school districts continued to increase, and technological progress in the broader culture began outstripping school infrastructures by years (with kids feeling like they are going back in time when they enter school buildings). This has led to the deterioration of teaching and learning in schools—failures that have been well documented (Hursh, 2008; RAND, 2011).

I argue here that there are issues deeper than the US educational system's *failures*, e.g., failures to provide adequate buildings, or failures to foster a love of learning, etc.—its sins of omission, if you will. Recent decades have shown the system capable of committing sins of commission—where educational processes become unacceptable because of what is being *done to* students, not just because of what is *withheld*, lacking, or inequitably distributed. Two trends occupy my attention here: standardized testing and educational psychopharmacology. Tests and pills. These are the technocratic solutions to the educational crises of the 21<sup>st</sup> Century. In this paper I show how they reveal the logic of reductive human capital theory and the structure of its coercive, de-agentifying, instrumentalizing educational practices.

In order to better diagnose these pathologies of reductive human capital theory I begin by laying out a set of normative meta-theoretical distinctions. Drawing on the work of Wilber and Bhaskar, I build a minimalist integral meta-theory of education. I then look at some ethical issues involved with standardized testing infrastructures, briefly touching on the history of their use in the US as a function of human capital theory. My proposed integral meta-theory of education is employed to reveal ethically significant differences between *efficiency oriented* testing practices, and *justice oriented* ones. I argue further that the recent epidemic of psychotropic drug prescriptions for school aged children is dialectically related to the dominance of efficiency oriented testing infrastructures, both through their common roots in reductive human capital theory and through their practical in-the-classroom compatibilities (e.g., kids on pills do better on tests). Looking at the rhetoric and science surrounding the growth of educationally oriented psychopharmacology, I deploy the same meta-theoretical approach to characterize the ethical difference between *designing* children and *raising* them. I conclude with a series of provocations and reflections directed at kindling the social imagination and reviving our sense that there are alternatives to dystopian educational futures. Tomorrow's child will inhabit the most pervasive, invasive, and complex educational configurations in history. But there are possibilities for meta-theoretically guided transformative practice and design in education—ways by which to bend geo-historical forces toward the creation and perpetuation of more humane, just, and liberating educational systems (Dewey, 1916; 1929).

*Integral educational meta-theory: beyond reductive human capital theory*

I have written elsewhere about the nature of meta-theory, its relation to philosophy, interdisciplinarity, the sciences, and developmental psychology and education in particular (Stein, 2009; 2010; 2010a; 2011). I've argued for a specific form of meta-theorizing that is predominantly normative, "problem-focused and methodologically pluralistic," and which serves as a basis for discourse-specific critique and dialectical comment; a role I have described as *the discourse regulative function of meta-theoretical endeavors* (Stein, 2010). Meta-theories, I have argued, are theories that set the terms by which sub-theories are built, or that "norm the norms" by which sub-theories are validated and put into practice. Therefore, meta-theories are an important part of the universe of discourse and function in complex ways, especially when they are inchoate or suppressed, which is often the case in post-modern culture.

Following Habermas, I've argued that one of the defining aspects of post-modern culture is its lack of meta-theory and meta-narrative, and the related inability of individuals to build universalized and historicized action-orienting self-understandings (*Ibid*). According to this line of thought, it is no longer the monovocal ideological meta-narrative of modernity that inhibits the moral evolution of the species; it is now the *absence* of any explicit shared meta-narrative or meta-theory that inhibits enlightenment. However, behind the polyvocal pastiche of our post-modern geo-historical moment, meta-theories and meta-narratives exist in abundance; they have simply been forced underground. As Bhaskar (1986) demonstrated in his ideology critique of positivism, one

of the most powerful things a meta-theory can do is to convince the world it does not exist, or, more typically, that there is simply no alternative.

So when I propose that human capital theory is the predominant educational meta-theory in post-industrial societies, I am not suggesting that it functions this way explicitly or by design, although, of course, sometimes it does (Goldin & Katz, 2008). The idea at the core of human capital theory as an educational meta-theory is that the main function of educational systems in complex societies is to supply the economy with the next generation of workers. This idea has been active in political life for some time (Becker, 1964), and can be seen as a successor to the idea that educational systems function to create pliable citizens and patriots (Cremin, 1970; 1988). The idea that educational systems feed human capital into the economy organizes a related constellation of concepts and theoretical commitments, e.g., simple de-stratified economic models of human behavior, the abstract universalization of value, cost, and benefit, and the homogenization of system-supported identities, among others. Human capital theory, in a variety of more or less explicit forms, has become the assumed consensus meta-theory for a wide variety of educational configurations; from large-scale educational policy and research to the ideals parents have for their children's education.

Because the discourse around human capital theory is very large, and there are many complex and nuanced positions, I will be making reference to a particular species of *reductive human capital theory* (RHCT). This is not so much a straw man as an ideal type. The term "reductive" is also a necessary qualification, because, as will become clear below, it is possible to conceive of integrally informed alternatives to human capital

theory. These alternatives situate the moment of truth in RHCT in terms of more complex and differentiated social theories, dislodging the primacy of instrumental reason, and deepening theorizing about individual agency, freedom, and choice. RHCT is, by definition, incapable of dealing with complexity, agency, or dialectal and communicative reason. This is because, using Bhaskar's terminology, RHCT is *ontologically monovalent*—a form of thought committed to reducing the ontological complexity of education as much as possible, concerned only with the control and prediction of closed systems.

Below I explore how the reductive-instrumental rationality of RHCT can be seen in traditional approaches to standardized testing that make simplistic and untenable assumptions about teaching, learning, and culture. Yet despite the theoretical and empirical inadequacies of these approaches to testing, the dominant narrative in educational policy circles is that there is no alternative to these approaches for fostering accountability and efficiency in large-scale educational organizations. Likewise, psychopharmacological approaches to educational underperformance are based upon the idea of treating ADHD and related disorders as discrete disease entities, which involves untenable assumptions about the nature of learning, behavior, and human development. Yet psychopharmacological approaches prove useful for raising academic achievement as measured by performances on standardized tests—an outcome of such unquestioned value that it is viewed as an acceptable risk to have the brains (not to mention the self-understandings) of millions of children fundamentally alerted by the forced administration of psychotropic drugs.

These and other symptoms of RHCT are revealed below through the use of meta-theoretical models from Integral Theory (IT) and Dialectical Critical Realism (CR). Wilber (1995; 1999; 2006) and Bhaskar (1986; 1993) offer complimentary comprehensive philosophical meta-theories. I do not have space to discuss the full range of their shared philosophical commitments, constructs, and methods, which include: reconstructive/transcendental arguments; social science conceived as an axiology of freedom; ontological emergence, change, and evolution; stratified selves/compound individuals; differentiated and laminated social realities; transformational bio-psycho-social models of human agency; and the immanent possibility of geo-historical evolutionary 'progress' toward a eudaimonistic society. The full Venn diagram, if you will, showing also their respective omissions and absences is a task for another time (Stein, forthcoming).

Here I employ two related ideas that both meta-theoretical systems share: a 4-fold model of social reality and a transformational bio-psycho-socio-cultural model of human action. Both ideas are clearly represented by Wilber's four quadrants and Bhaskar's four-planer social cube. These models represent human social reality, and thus the structure of human action, as a "four-planer" or "four-quadrant" autopoietic dynamic. That is, according to these models, social reality consists of *at least* an individual, in a cultural and social system that is reproducing itself in relation to natural realities, both those internal to the social reality (individual psycho-biology) and those that are external (the biosphere). Said differently, and still resisting the urge to have an orgy of diagrams, both models are attempts to represent the full complexity of the social realities addressed by the human sciences, which must account for at least the *interplay* of: individual agency

and psychology; cultural/hermeneutic reproduction and transmission; social-systems and institutional structures; and the natural realities of the body and biosphere. Below I adopt these dynamic 4-fold models of social reality and human action as the minimal components of an Integral Meta-theory of Education (IMoE).

A fully articulated IMoE would include more than just a bio-psycho-socio-cultural model of social reality and human action. There would be (among other things) levels of development (both individual and socio-cultural), psychological frameworks for transcendence, spirituality, and metaReality, as well as commitments to universally efficacious evolutionary processes, from the individual to the geo-historical and cosmic. But these additional meta-theoretical accouterments are not needed for my purposes here, and, in fact, may not be needed in many cases where the goals of meta-theoretically enabled critique are simply to redress *flagrant* reductionisms and irrationalities. I do not have space to argue for this kind of opportunistic, rhetorically-made-to-order meta-theorizing, which follows from my arguments elsewhere in support of a *problem-focused methodological pluralism* that attends to the pragmatics of discourse-specific critique (Stein, 2010). Rather than arguing for a particular approach to meta-theory, the goal of this paper is to make a set of specific critical comments concerning contemporary educational configurations and to outline related possibilities for preferable futures. I turn now to this task, with a minimalist IMoE in hand.

*Human capital metrics: between efficiency and justice*

There are several broad socio-political motives for institutionalizing standardized educational measurement. RHCT values representations of complex educational



processes that are put in terms amenable to certain kinds of legal, economic, and political decision-making. Decisions about the educational systems involve taxpayer money, conflicting values, and political disagreement, so appeals often need to be made to ostensibly unbiased and objective facts about schools, which many argue tests can provide. Modern educational systems face complexities of bureaucratization and juridification comparable to those faced by modern health care systems, where the need to measure both cost and treatment effectiveness have transformed the nature of medicine (Liebenau, 1987). Today, trends toward high-stakes accountability and efficiency-minded practices (in which testing figures prominently) aim at transforming the delivery of educational goods into an instrumental market-driven activity. The result has been cultures dominated by *efficiency oriented testing practices*, where measures built to yield system level data for school leaders and political decision makers shape the intimate educational experience of students (Spring, 1989; Habermas, 1987). These practices are focused on system-level monitoring and bureaucratic functions, such as sorting students into cohorts, determining program effectiveness, and fostering accountability in the system, among other things. *Justice oriented testing practices*, on the other hand, transcend but include efficiency-oriented practices. Guided by a more comprehensive understanding of teaching, learning, and culture, they are focused on monitoring and enabling the fair distribution of basic educational goods and promoting the autonomous growth of individual students. Lessons from the history of testing will help illuminate this important distinction.

*Educational testing: a brief history*

The roots of modern educational testing can be found in the work of the earliest psychologists. Precisely engineered electrical equipment and newly invented psychometric techniques allowed for the kinds of precise measurements that brought early prestige to psychophysics, and later, to behaviorism. As psychology grew beyond the laboratory, the importance and prestige of measurement remained, and the practice of mental testing became central to the identity of the emerging discipline (Brown, 1992). IQ testing, in particular, captured the public imagination and quickly found its way into the plans of policy makers and educational reformers (Gould, 1981). By 1930, IQ-style multiple-choice standardized testing was ubiquitous in American public schools, and was typically used to track students into different groups for instruction and management (Chapman, 1988). This growing testing infrastructure also allowed for the beginnings of the “scientific management” (aka RHCT) of school operations (Callahan, 1964). Educational researchers began, for the first time, to systematically use test results to inform their thinking about school improvements (Lagemann, 2000). These first large-scale testing efforts were carried out under the banner of organizational efficiency and educational research. They offered the kind of objectivity and simplicity of representation required by the RHCT arguments that were beginning to dominate the increasingly complex and politicized educational system.

Then, in 1931, a young high school science teacher from Michigan solved a technological problem that IBM had been working on unsuccessfully for years:

automated test scoring. The implications and subsequent technical developments—such as the Scantron machine—would facilitate the construction of the first national standardized testing infrastructure (Lemann, 1999). The centerpiece of this newly automated testing infrastructure was the Educational Testing Service (ETS), which emerged, in part, as a result of the federal government’s interest in exercising quality control and determining how best to fund research and development. Several waves of sweeping federal legislation during the Cold War consolidated the shape of late-industrial era education, including funding to create the NSF and promote STEM education in K-12, civil rights, desegregation, and the War on Poverty programs (such as Head Start).

The federal government began recruiting the testing industry to aid in policy and program evaluation studies (Campbell, 1975). As the RHCT-based “scientific management” of educational reform drew widening support, federally mandated educational testing expanded, eventually including the NAEP, the Iowa tests, and a host of other national K-12 tests. The federal influx of support for testing led also to broad concerns that the educational system was being turned into a kind of “sorting machine” for human capital, rewarding a limited set of educational trajectories through the use of tests that focus on mostly STEM related skills and competencies (Spring, 1989). Relatedly, the negative effects of increased testing on classroom practice continued to mount, as the high-stakes multiple-choice exam came to symbolize American education itself (Samelson, 1990; Sacks, 1999)

Yet continued advances in the computerized administration and scoring of tests fueled policy makers’ ambitions to build a national K-12 testing infrastructure for use in

program evaluation and systems-level accountability (Phillips, 2003). The final push toward a comprehensive federal testing infrastructure began with President G.H.W. Bush's *America 2000* (Bush, 1991), in which he proposed a national testing apparatus that would be tied to a national curriculum and used to assure the equitable distribution of educational opportunity, as well as American competitiveness in the global marketplace. President Clinton later endorsed the plan but backed off the idea of a national test. In 2001, *No Child Left Behind* (Hess, 2006) provided a federal mandate to build a K-12 testing infrastructure for accountability purposes, but not in the form of a single national test. Instead, a decentralized, competition-oriented, RHCT-inspired, set of testing practices was rolled out. This spawned a rapidly expanding for-profit computer-intensive testing industry, which has proven to be error prone, corrupt, and dominated by simplistic psychological and psychometric theorizing (Toch, 2006). The Obama administration has dismantled NCLB, but has sustained a broad commitment to RHCT-inspired efficiency-oriented testing, putting millions of dollars into a "next generation" tech-enabled testing infrastructure that promises to increase the number of tests and the impact on school cultures, teaching, and curriculum.

*On the difference between efficiency and justice*

From the perspective of an IMoE, and its commitments to a 4-fold model of social reality and human action, the history of testing is one in which there is a profound and conspicuous *road not taken*. The earliest psychometric pioneers were guided by the idea that the psychological and social sciences could be leveraged to aid in the construction of a profoundly enlightened and liberating educational system. As standardized

measurement infrastructures had revolutionized the physical sciences and brought incalculable social benefit (e.g., civil engineering and medicine), so would educational measurement, continually informed by cutting edge research, allow for the radical re-design of educational systems. Psychologists, sociologists, and educators would soon dismantle the simplistic psychological models that guided the earliest approaches to testing, putting in their place complex, 4-fold, bio-psycho-socio-cultural models of learning and culture. These advances opened the possibility for *justice oriented testing practices* that would facilitate the mass-customization of individualized education and assure the equitable distribution of resources and the fair treatment of individuals. However, the urgency with which testing was institutionalized as a part of the war effort—and in the context of rapid urbanization and public school expansion—led to a premature reification of the function and meaning of testing. Overwhelmed by the unprecedented complexity of administering modern school systems, and under increasing public pressure to prepare children to enter a rapidly industrializing economy, school leaders and administrators had little sympathy for those who were out to make testing more than a tool for bureaucratic efficiency.

The result has been that modern educational systems are dominated by testing infrastructures that neglect the 4-fold complexity of social reality. History reveals that the growing prevalence of a particular view of how educational organizations should be managed propelled increases in the size and scope of testing infrastructures through the adoption of technological innovations enabling economies of scale (e.g., multiple-choice test item; the Scranton machine). This way of viewing the nature of schools was imported as “scientific management” from industry. It characterizes school systems as if they are

factories processing raw materials, with objectively measurable inputs and outputs, where the dominant institutional virtue is efficiency (Callahan, 1964). *Efficiency oriented testing practices* are designed to simplify the complexity of educational configurations in order to facilitate certain kinds of data driven managerial decision-making. They are tools for surveillance and system monitoring akin to the measurement infrastructures used in industry for quality control and cost-benefit-analysis.

Yet what is being measured are not objects, but people, and the traits of interest are not length, weight, or other manufacturing specifications, but qualities of mind, skill, and personality. This has led to a situation in which a system of categories built for purposes of instrumental-rationality and control has become the dominant system of categories used in schools to guide the construction of students' action-orienting self-understandings. There is perhaps no greater insight into the detrimental effects RHCT has had on education during the past century than this: efficiency oriented testing practices have come to provide the categories in terms of which students (and teachers and school communities) understand themselves. This state of affairs has become progressively worse during the past decade. Federal policies have increasingly promoted testing practices in which communities are shamed by school closings, teachers' "value added scores" are published in newspapers, and students' life prospects (and academic self-concepts) are shaped by forms of testing that are demonstrably inappropriate for these purposes.

The claim that contemporary testing infrastructures have led to systematically distorted forms of self-understanding is supported by the fact that the history of testing

has very little to do with the history of psychology and educational theory. During the century that gave us Dewey and Piaget (among many others!) the testing infrastructure changed primarily in response to advances in technology and the needs of bureaucrats—*not* in response to advances from the learning sciences that were progressively revealing the nature of how educational processes *ought* to be structured. That is, as advances in educational and developmental psychology opened possibilities for approaches to assessments based on meaningful, student-centered, and psychologically realistic systems of categories and constructs, the dominant approach to testing remained focused on measuring under-theorized constructs (e.g., scholastic aptitude) using simplistic means (e.g., multiple-choice). Evidence continues to mount concerning the detrimental effects of these psychologically naïve testing practices, especially their stigmatizing and disempowering impact on students, and their tendency to radically truncate the pedagogical and curricular options available to teachers (RAND, 2011).

Importantly, this same reductive approach to understanding learning and teaching has led to a broad cultural movement in support of psychopharmacological solutions for educational underperformance. If testing facilitates the mischaracterization of students as objects amenable to instrumental manipulation, it is only a small step to re-imagine education in terms of actual physical interventions into the biology of the child. Moreover, because these interventions improve scores on the very tests that mischaracterized the child in the first place, the approaches are reciprocally reinforcing and creating an ostensibly coherent approach to educational reform in the 21<sup>st</sup> Century. This dialectically related ensemble of efficiency oriented testing, psychopharmacology, and RHCT is shaping the future of education as if there was no alternative.

*Educational psychopharmacology: between designing children and raising them*

Today, in schools around the world there are millions of children whose lives have been shaped by educationally oriented psychopharmacology. Although the numbers vary as a function of socioeconomic conditions (Zito *et. al.*, 2005), there is a clear and striking global trend toward increasing use, as evidenced, for example, by major growth in the markets for ADHD medications (Scheffler *at. al.*, 2007). Parenting and schooling have been transforming as a result (Diller, 2006). The media disseminates direct to consumer advertisements for key products, as biotech companies make huge profits from ‘child-focused’ campaigns (Rasmussen, 2007). We find ourselves in a historically unprecedented situation facing complex moral issues. Discussing treatments for ADHD in particular, this section highlights the increasingly prominent role that psychotropic drugs play in contemporary educational configurations. These trends in educationally oriented psychopharmacology, like those discussed above regarding testing, reveal the pathologies and distortions of educational configurations dominated by RHCT.

Just as the large-scale institutionalization of efficiency oriented testing infrastructures has been justified by the importation into education of management models from business and industry, so the rapid increase in psychotropic drug prescriptions for children has been justified by the importation of treatment models from medicine. In both cases, the ontological monovalence of RHCT has lent credibility to reductionist (flatland) models of education, which oversimplify the nature of learning processes, neglect the 4-fold complexity of social reality, and characterize education as simply involving the prediction and control of closed systems. In both cases, scientific



advances about the nature of learning and education are not driving reform and large-scale implementation; rather it is an economically based desire to make a certain kind of educational system “work.” Exploring the state of knowledge about ADHD, as well as the state of practices in schools, clarifies the dangers and injustices accompanying the RHCT-based medicalization of academic underachievement.

*ADHD: science, controversy, and ideology*

ADHD is a disorder characterized by inattention, hyperactivity, and impulsiveness, and it is a good predictor of negative academic and economic outcomes (Swanson *et. al.*, 1998). Teachers are typically the first to suggest the possibility that a child might need an ADHD diagnosis (Sax & Kautz, 2003), and roughly 75% of those diagnosed are male (Schneider & Eisenberg, 2006). Of those diagnosed, more than half are also diagnosed with conduct or oppositional defiant disorder (Jensen *et. al.*, 2001). It is family practice doctors—not child psychiatrists—that handle most referrals and issue most diagnoses and treatments (Parens & Johnston, 2009). And, overwhelmingly, the most common treatments involve the prescription of stimulant medications, such as Ritalin and Adderall (Safer *et. al.*, 1996). Although figures vary, it is estimated by the United States Centers of Disease Control that roughly 8.4% of children between the ages of 6 and 17 will at some point be diagnosed with ADHD—that is about 4.6 million children (Pastor & Reuben, 2008). And the United States appears to be setting a global trend, as numbers reflecting the annual use of ADHD medications show major recent growth worldwide (Scheffler *at. al.*, 2007).

But this is where agreements about ADHD end. Facts about the causes of ADHD and the most effective treatments for it are complex, incomplete, and contested (Parens & Johnston, 2009; Singh, 2008). The long-standing dopamine theory of ADHD suggests that executive-function deficits involving the dopamine system are responsible for symptoms (Swanson *et. al.*, 2007). However, it is questionable whether problems with executive function alone are necessary and sufficient for a manifestation of the disorder (Sonuga-Barke, 2005). Moreover, genetic research guided by this hypothesis and looking for predictors of ADHD has been inconclusive, finding minimal evidence for the involvement of genes known to be involved with dopamine transporters and receptors (Li *et. al.*, 2006). And while neuroimaging work has revealed suggestive anatomical and functional differences in subjects with ADHD when compared to controls, most studies have been conducted using samples that are too small to yield conclusive results and that do not include children and adolescents (Seidman *et. al.*, 2005). Some studies do suggest possible environmental causes (Braun, *et. al.* 2006), but most research focuses entirely on casual factors within the individual. The most promising avenues for future research focus on multiple etiologies, diverse developmental pathways, and the effects of environmental factors (Nigg *et. al.*, 2004; Sonuga-Barke, 2005). Researchers hope that these avenues might eventually shift diagnostic practices away from symptom identification and toward more complex and dynamic bio-markers of individual differences (Chamberland *et. al.*, 2007; Singh & Rose, 2009).

The state of ADHD diagnosis and treatment is comparably complicated. As already mentioned, despite clear trends suggesting that certain common practices are widespread, there are, in fact, very prominent regional differences in rates of diagnosis.

These differences have led many to argue that ADHD is *under*-diagnosed in impoverished communities while it is *over*-diagnosed in wealthy and middle-class ones (Diller, 1998). Although the most common treatment for ADHD is stimulant prescription drugs, what studies there are about the efficacy of these treatments do not provide straightforward results (Parens & Johnston, 2009). Studies originally suggesting that drugs worked better than behavioral therapy have been reanalyzed to reveal that, in fact, outcomes resulting from treatments involving drugs alone were less desirable than those that combined drugs with cognitive behavioral interventions, and these outcomes were only minimally superior to behavioral therapies alone (Carey, 2000). Also, it is not at all clear that drug induced symptom reductions (as measured using DSM criteria) necessarily lead to the desired improvements in academic achievement (Loe & Feldman, 2007). Moreover, how stimulant drugs work to improve ADHD symptoms is not well understood (Singh, 2008), which is not surprising given the state of the aforementioned brain research.

However, the realities “in the trenches” of school and family life, where the number of diagnoses and drug treatments continues to rise, do not reflect the tentative and preliminary nature of the state of the science. This has led some to stress that this is, simply and objectively, a dangerous and uncertain situation (Hyman, 2002; Rasmussen, 2007). Nuanced ethical arguments aside, next to nothing is known about long-term usage of stimulants in childhood and adolescence. Although, research conducted on adults and animals has demonstrated that these drugs do have a set of undesirable physiological effects when used in large quantities over long periods, effects such as addiction and the stunting of growth (Rasmussen, 2007). It has also been demonstrated that when those

who have found success with drug treatment discontinue medication their symptoms return (Parens & Johnston, 2009). This means that as the first generation of “Ritalin kids” find their way into college and the workforce they will continue treatment for symptoms, some having been on the drug for the vast majority of their lives—nearly 20 years. Ritalin and Adderall now rival alcohol and marijuana as the most widely used recreational drugs on college campuses, where they are typically used in higher doses for off label purposes (Diller, 2006). Billions of pills containing Schedule II substances are in circulation among an age group known for high-risk behavior, and so the possibility of an iatrogenic crisis affecting a whole generation of young adults worries many observers (Rasmussen, 2007; Healy, 2002).

Nevertheless, despite these uncertainties and risks, millions of children are diagnosed with ADHD and treated with drugs, and the prevalence of these practices continues to increase. This suggests that trends in diagnoses and treatments for ADHD are more than the result of advances in the science and art of educational psychopharmacology. *The ideology of RHCT is to blame.* There is evidence of clandestine and conspiratorial relations between drug companies and the disability advocacy groups (such as CHADD) that have tirelessly worked at legitimizing ADHD as a widespread disorder amenable to drug treatment (Conrad, 2007; Rasmussen, 2007; Fukuyama, 2002). There are also broad shifts in culture toward “blaming the brain” for what used to be considered moral failures (Elliot, 2003), changes related to the general acceptance of a “biomedical self” in both popular culture and the human sciences (Kagan, 2009; Healy, 2002). These considerations are consistent with views that explain practices surrounding ADHD in terms of more general trends in the medicalization of the human

condition (Conrad, 2007; Illich, 1977). These theorists raise concerns about what it means to reframe underperformance and misbehavior as biological dysfunctions, suggesting it amounts to the individuation of social problems and the de-politicization of deviance.

*On the difference between designing children and raising children*

In light of an IMoE it is easy to see the *partialness* of most current attempts at helping children with ADHD. They shift attention away from the quality of the educational configurations and toward the biology of the child. Instead of considering that social and cultural factors may be a part of the problem, the problem is located in the child's biological substrate. Thus, the child's brain is to be fixed to fit into available educational configurations, as opposed to fixing these configurations so they are responsive to the individual differences of the child (Olfman, 2006). This approach to treatment is an artifact of RHCT, which guides the development of educationally oriented biotech, where medical means are used to affect educational ends. As opposed to adopting a poly-focal approach concerned with the interaction of numerous bio-psycho-social factors, a specific biological dysfunction is blamed and targeted with a specific biomedical intervention.

Just over a century ago some scientists began to suggest that education could be made akin to building or engineering, thus first suggesting the prospect of *designing children* (Pavlov 1927; Skinner, 1938, 1971). This approach entails that the internal dynamics and growth processes of individuals be taken as objects of manipulation—*working on* the life being shaped, as opposed to *working with* it. Designing a child is a

process in which a 3<sup>rd</sup> person perspective is adopted and an instrumental intervention is used to change behaviors, dispositions, and capabilities. In principle, there is no need to make use of relationships built on communication, compromise, or mutual expectation—no need to embrace the 4-fold complexity of social reality. Instead, this approach amounts to a unilateral *construction* of who the child will become. Designing a child is a relationship with a monological structure of non-reciprocal imposition, established in light of the designer's goals for the child without input from the child or consideration of the child's goals. The child does *not* participate in shaping her life, but is acted on from the outside. The child experiences behavioral and dispositional changes resulting from processes beyond her control with results she does not consider herself responsible for producing.

This distinction concerns the structure of the educational relationship in question. The line is drawn between relationships that respect the child's (limited and burgeoning) autonomy and those that override the child's nascent autonomy in the interest of goals to be imposed upon the child. The distinction focuses on the way people intervene in children's lives, and actually establishes a continuum applicable in the analysis of any educational relationship. Biologically focused interventions tend toward design. They make it possible to get results—to change behavior as desired—without establishing the kinds of relationships typically associated with the raising of children.

This is critical because, according to an IMoE, children establish their identities in specific socio-cultural contexts and relationships that embody specific preferences and values. Development is a dynamic process of individuation through socialization; an

individual *negotiates* her identity in relation to the desires of significant elders and broad cultural patterns. However, when educationally oriented biotechnologies are used to affect the outcome of identity formation, a child's ability to negotiate her own identity can be lost, as the preferences of parents or prevalent cultural norms are literally *built* into her biology. As noted during the discussion of ADHD, most treatments do not involve questioning the socio-cultural contexts in which the child manifests symptoms. Instead, attention is focused on the biology of the child only, and it is not considered whether some of the norms and rules the child is being asked to conform to might be unreasonable. Importantly, educational configurations that work this way effectively instantiate a system of norms that is insensitive to dissent and that relies on an ability to design children who will conform. This is a violation of the child's autonomy—literally disallowing the child's 'self-legislative' ability. Thus, parents or cultures that severely constrain the choices available to their children during identity formation are seen as repressive (Nussbaum, 2000). All children have 'the right to an open future,' in which they can act autonomously and responsibly (Feinberg, 1992). And all children have a right to participate in their own development (United Nations, 1989). This brings us to the heart of the ethical violations that result from the dominance of RHCT as the meta-theory of education.

*Conclusion: ethics and the new education*

I have woven a complex story about the impact of RHCT on contemporary educational configurations. Extrapolating the trends discussed suggests the emergence of a new kind of educational system in the coming decades. During the twilight of American

dominance and in the context of unprecedented global interconnectedness and complexity, school systems are being re-designed to fit the strategic and instrumental needs of largely economic geo-historical interests and entities. Since the end of WWII, RHCT has set the terms by which educational possibilities are understood and pursued, resulting in a public education system of vast size and scope, conceived by policy makers as a “sorting machine” for human capital (Spring, 1989). Now, in the early years of the 21<sup>st</sup> Century, this homogeneous public education system is being dismantled and replaced by a heterogeneous mixture of (for profit) charter schools, on-line education providers, and what remains of traditional schools (increasingly underfunded and undervalued). What are emerging are the most complex, pervasive, and overtly economically driven educational configurations in history.

The new education is one in which the goal of the system is no longer to create citizens who share a common fund of knowledge and culture as a result of shared educational experiences. This Deweyian ideal—which while never achieved, did serve to counteract the total cooptation of public schools by economic interests—has been almost entirely dissolved by the relentless push of RHCT-based approaches. As discussed above, testing infrastructures have become the criterion by which educational institutions are evaluated and according to which students, teachers, and school leaders understand the goals of education. The resulting simplification of educational processes has short-circuited reflective discourse about the goals of education by creating the illusion that competing (sic) educational configurations can be compared as simply as comparing the bottom line of competing companies.



Add into this mix the trends discussed above concerning educational psychopharmacology, and a picture emerges in which students' nervous systems become part of the "system environment" (Habermas, 1987) that must be controlled in the interest of pursuing narrowly defined parameters of system success. Just as manufacturing efficiencies are often accomplished through the use of measurement practices that make invisible the collateral damages that are done to the environment, the test-driven efficiencies of the new education involve collateral damages that are hidden in the brains of students, beyond the realm of what is measured when considering the success of a school. That is, RHCT-inspired test-driven competitions between educational approaches are intended to find solutions that work (e.g., raise test scores), without regard for how this success is achieved—even if success involves normalizing the large-scale administration of psychotropic drugs to children.

As argued above, the increasing prevalence of psychopharmacological approaches in education is due in large part to the way testing has distorted communication about the goals of education. Counteracting these trends requires changing the terms of the debate. Educators will be unable to demonstrate the effectiveness of non-psychiatric approaches for as long as the means used to measure effectiveness remain simplistic and reductive. The irrationality and immorality of instrumental interventions into the brains of children will remain suppressed for as long as there appear to be no alternatives to what must be done in order to succeed in the current system. This is a path toward the economically driven auto-transformation of the human nervous system, in which educational configurations are built to alter children's brains to fit the needs of an increasingly complex economy. The continued unilateral *design* of the next generation by those

currently in power is a radically unjust situation in which individuals are rendered incapable of taking responsibility for their own lives, denied the autonomous pursuit of a self-chosen conception of the good, and thus denied the freedom and self-respect typically given to responsible humans (Habermas, 2003; Nussbaum, 2006).

*Tomorrow's child: redesigning education to recreate the economy*

There are alternatives to these dystopian educational futures! The minimalist IMoE I have used throughout this paper suggests a way forward that would lead to a fundamentally re-designed educational system. The 4-fold complexity of social reality suggests a more complex “multiple bottom lines” approach to considering educational success. Beginning with the individual, it must be recognized that the reproduction of social realities is always accomplished through their transformation, specifically through the creative autonomous actions of agents who are held responsible for what they say and do. RHCT envisions a future that is simply a continuation of the present, whereas an IMoE envisions a radically open future, dependent upon the creative actions of future generations (Bhaskar, 1993). This leads to a focus on the conditions that foster the development of autonomous, reflective, and ethical individuals. That means building the educational system around the realities of human psychology and social relations, as opposed to building it around the needs of the economy.

Accomplishing such a profound shift in the priorities guiding educational design requires a new kind of testing infrastructure. It requires an approach to testing that can make meaningful learning visible, provide insights into the diverse needs of students, and thus monitor the true distribution of educational goods in society. Such *justice oriented*

*testing practices* must be based on insights from the learning sciences that enable the measurement of multi-dimensional, psychologically real, learning processes; beyond the simplified, psychological naïve, RHCT-oriented tests of “basic skills.” This means designing a testing infrastructure that is intended to *directly* benefit teachers and students by providing them with scientific insights into their own teaching and learning processes. As opposed to tests built to simplify the complexity of educational configurations to aid administrators in decision making, this would be a testing infrastructure that reveals the true complexity of learning processes to those undergoing them, empowering students and teachers to take control over their lives in the classroom. Current approaches to testing are so far from this ideal of testing as a liberating technology that the possibility seems almost unimaginable, which has led many educators to spurn testing altogether. But a small group of learning scientists and philosophers have already begun radically re-design testing, pioneering powerful new directions in large-scale standardized testing (Stein, Dawson, & Fischer, 2010).

The innovative redesign of large-scale testing makes it possible to imagine a system built in light of the true complexity and diversity of human development and learning, with an expansive and compassionate vocabulary of educational evaluation and assessment, and a multitude of acceptable educational outcomes. Instead of designing students to fit the imagined needs of tomorrow’s economy, tomorrow’s economy would be conceived as open, contingent, and malleable—an economy capable of evolving to reflect the creative freedom of individuals raised into the fullness of their autonomy, responsibility, and imagination.

Contemporary policy and ideology consider the function of the educational system as merely to supply our vast global economy with human capital—educating entrepreneurial global citizen or building skills for the global work force. But what if we turned this on its head? What if we understood the economy as merely an infrastructure enabling a vast educational system, with all our entrepreneurial efforts channeled toward the betterment of human understanding and experience? RHCT values only a limited subset of what is possible as human potential. The greatest benefit of reversing the relation between the educational system and structure of the broader economy would be the resulting liberation of human potential. Humanity stands misshapen by radically partial valuations of its own possibilities. The educational frontier opens with new ideas about the values and possibilities of human life. These are more necessary now than ever, because the future is less predictable than it has ever been.

There have been cultures in which the young were educated into a form of life known by their parents and grandparents. And there have been cultures in which adults prepared children for new forms of life, which they did not know but could envision and understand. We live today in a culture in which we must prepare children for forms of life we cannot anticipate (Mead, 1970). Elders can no longer claim to fully understand the experiences their children are having and will have. Education must not be what it has been. Our children are tomorrow's already. We must educate them openly, in the world, without pretension of profession. Their world will not be the one we have known. So we must teach the teachers not to instill yesterday's knowledge, but to create spaces in which tomorrow's problems become visible.

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