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From "Bio-Power" to "Neuropolitics": Stepping beyond Foucault

Ivelin Sardamov
American University in Bulgaria

Abstract: According to Foucault, power in modern society is diffuse and pervasive, and works through the agency of free subjects. Its imperatives are internalized by individuals who become self-disciplined, are tied to a particular identity, and govern their own behavior accordingly. Drawing on recent insights from neuroscience, the whole process of norm internalization can be seen as an expression of "neuropower" and a form of "neuropolitics" through which social and power relations become ingrained not just in human bodies and minds, but also in human brains. In recent decades, this process has been partly reversed as a result of the proliferation of information technologies and the electronic media.

Key words: Foucault, bio-power, neuropolitics, neuroscience

Michel Foucault is often credited with reconceptualizing power almost beyond recognition. In the past, power had usually been described as belonging to a person or a group who could dominate or oppress others—or at least "get" them to do what they would not have otherwise done. Foucault, however, put a whole new spin on the issue. He described power as capillary or diffuse, ultimately forming a force field detached from any human agency; pervading the daily existence of individuals on all steps of the social ladder and ordering their lives in the minutest detail (or affecting the way they relentlessly regulate their own behavior). Foucault even seemed to endow power with an agency and logic of its own, quite independent of the goals and plans of social actors (Foucault 1980: 56).

To make things less counterintuitive, Foucault can be read as describing a major shift in the nature of power in the modern age. The middle ages had given rise to what Ernest Gellner (1979) once called the "dentistry state"—a state where the ruler would episodically project power to extract some surplus product from

peasants, to pre-empt challengers, or punish (usually quite violently) offenders; but, like Hobbes's Leviathan, he showed no interest in regulating the daily lives of his subjects. This form of government (or, in Foucault's terms, "sovereign power") fit well traditional societies where rules seemed clear and natural, and compliance was ensured by constant close-up mutual monitoring within small, face-to-face communities. Once those communities started to break up, however, there was a need for a new kind of social power that could channel the energies and coordinate the pursuits of the masses of newly disembedded individuals.

The new form of power which could allow for such channelling and coordination was what Foucault called "disciplinary power." It was a form of power based on institutionalised (at least potentially) constant surveillance of individuals to make sure that their behavior conforms to scientifically established norms. For the first time in history, techniques of power started to penetrate and order the daily lives of masses of individuals on a large scale, outside of traditional communities. Governments grasped the need for such micro-regulation and sought to extend its workings to whole populations whose characteristics and functioning came to be scientifically observed, measured, planned, and influenced. But the workings of power that were essential for the coordination of social activities and shaping the identities of individuals also unfolded outside of explicitly political institutions. To capture the nature of this new form of pervasive, life-ordering power, Foucault spoke of "bio-power" (Foucault 1978) and called for a radical rethinking of the whole concept of power. In his view, the study of power still harked back to an outdated model of sovereign power, and it was necessary to finally cut off the king's head in political thought, as it had been done in practice by eager revolutionaries (Foucault 1980: 121).

In his earlier works Foucault (1977) was more focused on the capacity of disciplinary power to produce "docile bodies" which could fill newly defined functions in factories, schools, hospitals, prisons, and on the battlefield. Later, however, he followed in the footsteps of Norbert Elias who had once described a lengthy "civilizing process" producing stronger affective self-regulation in individuals (Foucault 1977, 1978; cf. Elias 1978). Foucault shifted his attention from an emphasis on outward compliance with norms under conditions of surveillance and the threat of punishment to a focus on the extent to which norms become internalized, and external discipline is supplemented by self-discipline. In the process, individuals are not merely subjected to the will of and control by social superiors, but also become "tied to [their] own identity by a conscience or self-knowledge" (Foucault 1983: 212). Gradually, this identity begins to incorporate

stronger notions of individual autonomy and personal agency, and power comes to be exercised over "free" individuals—individuals who see themselves as entitled (and obliged) to build a strong identity as self-reliant social agents, and to chart their own path in life.

Such freedom, however, has its limits and qualifications. Though individuals see themselves as entitled to independence and even rebellion against oppressive social norms, most of them most of the time are guided by a degree of social conformity—they act in ways that are functional for the overall matrix of power, and thus remain complicit in their own subjection (Foucault 1980: 138, 203). Their identities are largely a product of power, therefore self-expression or self-reinvention from the starting point of these identities can hardly be revolutionary. Shifts in the boundary between normal and deviant behaviours and groups can similarly do little to halt the progression toward ever more insidious forms of social power and domination.

At the heart of this depressing account lies the notion that under a regime of (potentially) all-penetrating surveillance social norms become internalized and come to define our core identity. In this sense, we are the products of power, and the freedom we pursue is largely an illusion at the service of power. But what does it mean for norms to be "internalized"? How is this feat accomplished in practice? Psychological descriptions of "internalization" refer to the embrace of some values, ideas, or habits as a result of repeated exposure; to the adoption of a more or less enlightened definition of self-interest by individuals released from the shackles of an immutable tradition; or to non-rational processes like identification with authority figures, the formation of affective attachments, or even brainwashing. The intricate nature of the whole process of internalization, however, can best be understood if we take a look at a new body of relevant research—the findings of socially minded neuroscientists who have sought to formulate a new "social neuroscience" (Cacioppo et al. 2006) or "cultural biology" (Quartz and Sejnowski 2003).

These scientists have adopted a largely materialistic view of thinking and consciousness. They have argued that all figments of the human mind are ultimately produced by chemical and electrical processes in the brain. On the other hand, they do not see brain organization as genetic destiny; rather, they argue that particular institutional and social environments induce different patterns of brain wiring in individuals. These individuals thus become susceptible to the adoption of different social and political orientations, values and ideas (Sardamov 2007). An examination of this mutual influence/determination of social and brain organi-

zation could allow us to step beyond Foucault's concept of "bio-power." It could uncover a new form of "neuropower" and "neuropolitics" through which social and power relations become literally ingrained in human brains, not just in human bodies and minds.[1]

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The capacity for self-disciplined compliance with abstract norms highlighted by Foucault can in fact be linked to particular patterns of brain organization. There is a part of the brain cortex involved in the inhibition of the emotional affect generated by lower parts of the brain, the origination of abstract models and plans for action, and the overall regulation of brain functions. This command-and-control center of the human brain is the so-called "frontal lobes," the frontal part of the cortex of both hemispheres of the brain (Goldberg 2001). Among their main functions, emotional regulation or inhibition seems most crucial for the capacity for self-discipline described by Foucault. The acquisition of this capacity can be linked to particular patterns of development of the frontal lobes and the way they are connected to other part of the brain and to each other.

But how are these new patterns of brain development induced in individuals? Neuroscientists have discovered that brain regions involved in particular tasks tend to expand as a result of repeated performance of those tasks. For example, cab drivers have larger cortical areas involved in spatial orientation and memory, musicians have expanded areas involved in hearing and the control of fine motor movements, etc. (Greenfield 2003: 153). Also, individuals who repeatedly force themselves to do small undesirable tasks can induce in their own brains biological changes that provide a sustained boost to their willpower (Aamodt and Wang 2008). Such modifications are made possible by one particular quality of the human brain that has attracted much attention in recent years—its so-called "plasticity". The term indicates the reinforcement (or attenuation) of neural pathways as a result of repeated stimulation (or lack of it). This research suggests that individuals in societies undergoing profound social change would experience modifications in the wiring of their brains as a result of the different tasks and patterns of activity and neural stimulation they face (Fabrega 1977).

In addition to increased frontal lobe activation and connectivity, there are also other important adaptations in brain organization that have probably taken place as part and parcel of the social processes described by Foucault. Among these modifications, changes in brain lateralization (i.e., the localization of different functions in each of the two hemispheres of the human brain) seem particularly

important. The left and right hemispheres are generally described as the seat of logical-analytic and gestalt-synthetic processes respectively. They also play different roles in blending thought and emotion.

The right hemisphere is involved in a holistic perception of objects and phenomena and is closely connected to lower parts of the brain that produce instant emotional responses to the physical and social environment. It generates social emotions and a degree of empathy based on an immediate awareness of one's bodily sensations. Neural networks located in the right frontal lobe overlap other circuits that are involved in relating to others, and generate a sense of how individuals are involved in their social environment (Bower 2006). The right hemisphere "contains circuits for recognizing and feeling the self" which induce an overall "sense of being" (Blakeslee 2008).

The left hemisphere, on the other hand, has greater independence in its functioning. It generates more forward-looking, assertive and optimistic plans for action, as well as rationalizations for the impulses and intuitions it receives from the right hemisphere. Personal maturation in modern societies is often associated with a growing predominance of the left hemisphere (McGilchrist 2009), a shift that results in an expanding sense of personal agency and a linear, future-oriented sense of time. This existential posture is rather different from the emphasis on communal sharing and a cyclical, past-oriented perception of time typical of individuals with right-hemisphere predominance within traditional cultures (TenHouten 1997, 2005).

In addition to lateralization, the growing individualization typical of modern societies can be linked to other, more subtle modifications in brain organization. The processing of neural signals related to external stimuli and involvement in a larger existential context, and of a sense of individual "self," are localized in different parts of the cortex. The attenuation of neural pathways between these different parts of the cortex under shifting social circumstances and patterns of neural stimulation (particularly the chronic stress induced by complex social organization and new technologies) may additionally contribute to increasing individualization or estrangement from intimate communities and the larger world.[2]

The two aspects of personality discussed above, self-discipline (particularly emotional self-regulation) and a sense of agency and individual freedom, seem most important with reference to Foucault's conceptualisation of power and its capacity to shape particular patterns of human subjectivity. We can think of a form of power operating through different patterns of neural stimulation to mould the brain organization of individuals in a way that gives them a "falsely heightened sense of individual will", an impression of effective personal agency and control

over events affecting their lives (McCrone 1999: 253). This form of power can be seen as producing a new breed of individuals with stronger activation and connectivity of the frontal lobes, clear left-hemisphere predominance, and attenuated neural pathways between parts of the cortex involved in the processing of external signals and of a sense of individual self. Such modifications could also involve changes in the secretion of and sensitivity to various neurotransmitters and hormones, and even altered gene expression within neurons.[3]

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Seen in this new light, "power" can acquire a somewhat different meaning. A notoriously vague concept, it is even fuzzier in Foucault's usage. He endows the term with a wide variety of meanings—from a set of micro-techniques employed in the pursuit of particular behavioral modifications in directly observed individuals, to an all-encompassing matrix with a logic and purpose of its own, quite independent of the schemes and desires of particular social actors. Within this broad range of meanings, we can think of a new form of power involving patterns of neural stimulation that impinge on the human brain and influence its organization. Some of this stimulation is generated by or in accordance with the wishes of specific actors. Others—from the bustle of the big city and fast-paced social environments to the imperatives of multi-tasking to moving images on TV, computer, and gadget screens—are a result of the mushrooming of various new technologies, the increased complexity and density of social life, and the spread of new stimuli and daily tasks for individuals. We can think of this particular form of power as "neuropower", and of the whole process of neural modification under the rush of various external stimuli as "neuropolitics."

This concept of neuropower points to a glaring omission in Foucault's analysis—his much discussed neglect of information technology and the electronic media (Best and Kellner 1991: 52). We now find ourselves engulfed by electronic stimulation, to the point where we suffer an almost "total immersion in a daily experience saturated with fabrications to a degree unprecedented in human history" (de Zengotita 2002). The effects of this immersion in a "virtual reality" incessantly tickling our senses are stronger and more lasting than the effects of direct surveillance described by Foucault. They are probably inducing a further rewiring of human brains, particularly in children and teenagers whose neural networks tend to possess stronger plasticity.[4]

These processes started to gather speed in the 1950s and 1960s with the rapid proliferation of television. They were keenly observed by Marshal McLuhan[5] who

concluded that the explosion of the electric media was causing an information overload that numbed the senses and induced anxiety, exhaustion of the central nervous system, and general bewilderment. He defined the media broadly to include "any technology whatever that creates extensions of the human body and senses, from clothing to the computer" (McLuhan and Zingrone 1995: 239). In his view, "electromagnetic technology" was creating a completely mediated social environment. Like Foucault's pervasive disciplinary power, it served as a force field reshaping human sensibility and altering the "scale and form of human association and action" (McLuhan and Zingrone 1995: 272; Gerrie 2004). In McLuhan's view, information technology had always affected the psychological and social functioning of individuals. The phonetic alphabet and print media, which required sequential visual processing and abstraction, had induced individualist detachment and disengagement. The new "technological sensorium" replacing them was, on the other hand, stimulating all the senses. It was thus ushering in a new age of communal involvement and "retribalization"—a process that was rapidly "turning the planet into a global village" (McLuhan and Zingrone 1995: 248).

In his later writings, McLuhan linked the psychological and social effects of the electric media he had described to an overall shift in the pattern of hemispheric dominance in the human brain. He argued that in Western societies the left hemisphere had enjoyed a prolonged "cultural dominance" promoted by "an alphabet-based service environment of roads and transportation, and by logical or rational activities in social and legal administration" (McLuhan and Zingrone 1995: 371). In the electric age, however, the saturated bombing of all human senses is shifting the balance of power back toward the right hemisphere of the brain. It therefore has a powerful "Orientalizing" effect on individuals and society (McLuhan 1978: 58).

The technological maelstrom McLuhan described has more recently accelerated with the advent of computers, videogames, the Internet, social media, and of myriad electronic gadgets saturating the senses with little downtime (particularly smartphones, tablet computers, and the rapidly proliferating "apps" designed for those). In their totality, all these influences have contributed to an overall transformation of individual identity in contemporary societies. The overall thrust of that makeover, though, has not completely borne out McLuhan's predictions. Writing in the 1970s, social critic Christopher Lasch similarly argued that a flurry of images was overpowering the individual psyche and erasing the boundary between fabrication and reality. But in his view that process facilitated the breakdown of the individual ego and of self-control. Those changes in the structure of personality were carrying the "logic of individualism to the extreme of war of all against

all, the pursuit of happiness to the dead end of narcissistic preoccupation with the self" (Lasch 1991).

Lasch saw in much of the American counterculture of the 1960s an exaggerated expression of a tendency which was also spreading in mainstream social circles—a growing preoccupation with individual self-expression and a spreading inability to link individual life-paths to any larger purpose or narrative. This tendency was confirmed by pollsters. In the early 1970s, they had found out that only a few percent of respondents embraced values centered on individual self-expressiveness. By the end of the decade, such values were espoused by around 70 percent of the American public (Yankelovich 1998).

Other Western societies have also seen the rise of such "expressive individualism." This trend has been analyzed by countless sociologists and psychologists, some of whom have seen it in positive light as the development of new, more humane and tolerant "post-materialist" values (Abramson and Inglehart 1995). Regardless of the label, the development of this new set of attitudes has gone hand in hand with the emergence of a new form of social power quite different from the mechanisms Foucault had described. As Herbert Marcuse (1964) and Gilles Deleuze (1992) have made clear, in recent decades new mechanisms of social domination and control have involved the breakdown of social norms encouraging perseverance and delayed gratification. In the process, individuals have found themselves under even more insidious, "free-floating" forms of control.

Those novel mechanisms of control are no longer tied to the operation of crumbling large-scale institutions. Instead, they have become diffused throughout society and have been mostly tied to the operation of the market economy as a chief instrument of social control. The many seductions offered by "the market" (and marketers) have induced individuals to assume rising levels of debt in the pursuit of self-expression and higher social status through consumption. Coupled with clever schemes linking their compensation to assessments of their performance and credentialed qualifications, such chronic indebtedness has kept mostly willing individuals chained to the proverbial "hedonic treadmill." The result is, in Deleuze's words, a "society of control" with almost no place to hide.

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Both the intensification of self-discipline Foucault posited and its subsequent dismantling have probably entailed shifts in patterns of brain wiring in masses of individuals induced by new social tasks, pressures, and expectations. Such shifts have in fact been uncovered by scholars studying the mental processes and brain

activation of children and teenagers. For example, German researchers have concluded that individuals born after the late 1960s have experienced a new level of sensual overstimulation, and have consequently acquired a "new brain" with considerably modified neural wiring. They have displayed progressively diminishing sensitivity to various kinds of sensual stimulation and growing emotional detachment from their immediate surroundings. To describe these changes, trend philosopher Gert Gerken has referred to a "new indifference" resulting in growing tolerance for dissonant bits and pieces of information (quoted in Kneissle 1997).

Until the explosion of information technology and the electronic media, the kind of neuropower described above can in fact be understood as a mere reformulation of the concept elaborated by Foucault incorporating some new findings in neuroscience. In the face of the proverbial information revolution, however, the nature of the challenge individuals in technologically saturated societies face has changed. As a result, the vague hope Foucault once offered for a possible "reversal of power" through understanding the "objective conditions of our social present" (quoted in Gerrie 2004: 17, 21) has become even fainter. In his later lectures and writings, he expressed some confidence that individuals could in fact extract themselves from the matrix of power he had once described as pervasive and inescapable. They could accomplish this arduous task through meticulous "care of the self"—artful self-cultivation and self-mastery re-enacting exemplary ancient ideals (Foucault 1986, 2007, 2008).

Because of this more hopeful message, the more mature Foucault is sometimes presented as a true follower of the Enlightenment humanism he had previously disparaged (Paras 2006). This twist in Foucault's thought, however, is partly undermined by the overall thrust of his work and by his generally Nietzschean "philosophical temperament." At best, the late Foucault can be read as offering the prospect of limited individual and social action, and recognizing in individuals "*some* capacity for effective and reflective action, self-discipline, self-control and limited critical agency" (Chokr 2006, emphasis in original). But even this more limited project of personal emancipation requires enormous motivation, energy, and powers of critical reflection. These are precisely the capabilities most persistently eroded by the sensory and social overload generated by the explosive growth of information technology and the social media.

The hope McLuhan offered in face of the information tsunami he observed was of a different nature. He proclaimed that the tribal global village he envisioned would bring back moral austerity and a renewed commitment to family values (McLuhan and Zingrone 1995: 253). Apparently, McLuhan's well-known com-

mitment to "Catholic humanism" inspired in him unfailing faith that the march of information technology would in the end help create a "new universal community" embodying divine reason (Kroker 1995). He also hoped that television, which he thought had a strong "audile-tactile" and thus empathic component (McLuhan 1962: 39), would reignite "ordinary human perception" and make possible a new era of cultural creativity (Kroker 1995).

As in the case of Foucault, these optimistic pronouncements do not square easily with McLuhan's less sanguine observations. In addition to acknowledging the overall numbing effect of the electric media, he recognized that "electromagnetic technology requires utter human docility" (McLuhan 1964: 64) and warned that "at the speed of light everybody tends to become a nobody" (quoted in MacDonald 2006: 512). McLuhan also had mixed feelings about the anticipated return to Joseph Conrad's "Africa within" as he invoked Germany's descent into tribal delirium in the 1930s (McLuhan 1962: 403). He predicted that the whole transition process could be wrought with much confusion and even violence, and claimed that he could not "cheer the dissolution of [Western] tradition through the electric involvement of all the senses" (McLuhan and Zingrone 1995: 267).

In light of recent technological and cultural shifts, Foucault's and McLuhan's darker premonitions in fact seem a lot more resonant and prescient than the more hopeful messages they wanted to send. Since the rapid spread of TV, and particularly with the growing ubiquity, pull, and hold of "virtual reality," successive generations of children, teenagers, and young people have faced growing challenges related to sensual overstimulation. In addition to an increasing exposure to all kind of information technology, they have experienced a more general information overload, increased social complexity, excessive choice among myriads of options in all spheres of life (Schwartz 2004), and a state of being constantly connected through communication devices, i.e., being "always on" without much downtime (Richtel 2003).

In this social context, young people have experienced generally higher levels of neural excitement, chronic stress, and sleep deprivation as a result of general sensual and behavioural overstimulation. As a result, they have been undergoing rapid and radical rewiring of their brains at ages when neural plasticity is much stronger as compared to adulthood (Kneissle 1997; Herbert 2000; Small and Vorgan 2008; Carr 2010). The resulting transformation of human sensibility, motivation, reasoning, and behavior cannot be understood with a mere reference to the pre-electronic techniques of power described by Foucault. Instead of the ever harsher self-discipline Foucault posited, contemporary societies seem saddled

with growing problems related to distractability, impulsivity, various addictions (including to TV, video games, the Internet, or to stress and overstimulation), and other mental problems in children and adolescents related mostly to weakening self-control and emotional self-regulation (Restak 2003). As Marcuse and Deleuze once observed, the self-disciplined individual with a sense of personal agency and efficacy (yet largely subject to conformity) described by Foucault is not the end of the human story.

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In the nineteenth and early twentieth centuries there was already much concern among intellectuals about the effects of modern (mostly urban) life on the neural systems of individuals (de Zengotita 2002, Carr 2010). Now these early anxieties seem to be finally caching up with our hurried lifestyles. In addition to the problems described above, neural overstimulation caused by a deluge of meaningless signals and data is apparently starting to induce growing disorientation in those most exposed to what David Shenk has called “data smog” (Shenk 1997). Such incessant overstimulation may be contributing to a growing emotional numbness and neural fragmentation in individuals (de Zengotita 2002, Bremner 2002). Increased social entropy and the ubiquitousness of information technology may in fact be engendering an overall “decivilizing process” with personality structures shifting from self-discipline to self-indulgence and various “real” and/or virtual addictions. This is a clear reversal of the social and psychological changes once described by Elias and Foucault (Dalrymple 2008).

These changes have been tied to the operation of new forms of social control premised on increased impulsivity and the pursuit of various forms of self-indulgence. Whether those mechanisms can continue to function in the absence of easy credit and rising levels of consumption remains to be seen. In any case, the increased levels of electronic and social overstimulation generated within contemporary societies can induce in masses of unsuspecting individuals an eerie sense of detachment and absurdity. Such emotional distancing makes it difficult to perceive meaning in the larger world and in individual existence. It obscures the broader significance (and particularly the moral implications) of unprecedented social and technological developments. It makes it harder even to perceive patterns behind the thicket of electronic and social stimuli that inundate our fragile brains.[6]

This “post-modern” existential posture has a curious implication. Behind all the scientific advances of recent decades, neuropower retains one general propensity of the kind of power Foucault sought to uncover—its tendency to hide

its operation from our ever dizzier eyes while continually imprinting itself on our bodies, minds, and—as indicated by recent research in neuroscience—even on our brains. A stronger awareness of the operation of neuropower and the dynamics of neuropolitics could perhaps help us grasp the radical nature of the giant social experiment in which we have become involved. Unfortunately, the odds for such sobering enlightenment appear to be only dimming (Greenfield 2008: 155–71).

Notes

1. Engin Isin (2004: 223) has previously used the terms "neuropower" and "neuropolitics" to refer to what he describes as the practice of "governing through neurosis". His argument can be taken a step further by noting that chronic neurosis is likely to induce major modifications in brain organization and functioning. *Neuropolitics* is also the title of a book by William Connolly (2002), but his argument is pitched at a fairly challenging level of complexity and abstraction.

2. These psychological and cultural tendencies can be linked to multiple theories associating social modernization with excessive individualism, alienation, anomie, disenchantment, desacralization, profanization, etc.

3. In recent years, such "epigenetic" changes have become one of the hottest areas of research in behavioral biology. Findings are still inconclusive.

4. Plasticity weakens with the myelination, i.e., the progressive coating of neurons in layers of a fatty sheathing, as part of the gradual maturation of the nervous system, but it never completely disappears.

5. I would like to thank the anonymous reviewer for *Techné* who drew my attention to Marshal McLuhan's work, some parallels between his and Foucault's thinking, and Jim Gerrie's *Techné* article highlighting such affinities (Gerrie 2004).

6. Higher-order cognitive and social abilities depend on weaker neural connections which can easily be disrupted, and such small neural dysfunctions can cause significant changes in overall perception and behavior (Ratey and Johnson 1997: 54, 220).

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