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On social plasticity: the transformative power of pharmaceuticals on health, nature and identity

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Abstract This article proposes a theoretical framework on the role of pharmaceuticals in transforming perspectives and shaping contemporary subjectivities. It outlines the significant role drugs play in three fundamental processes of social transformation in Western societies: medicalisation, molecularisation and biosocialisation. Indeed, drugs can be envisaged as major devices of a pharmaceutical regime, which is more akin to the notion of dispositif, as used by Foucault, than to the sole result of high-level scheming by powerful economic interests, a notion which informs a significant share of the literature. Medications serve as a key vector of the transformation of perspective (or gaze) that characterises medicalisation, molecularisation and biosocialisation, by shifting our view on health, nature and identity from a categorical to a dimensional framework. Hence, central to this thesis is that the same underlying mechanism is at work. Indeed, in all three processes there is an evolving polarity between two antinomic categories, the positions of which are constantly being redefined by the various uses of drugs. Due to their concreteness, the fluidity of their use and the plasticity of the identities they authorise, drugs colonise all areas of contemporary social experiences, far beyond the medical sphere.
A video abstract of this article can be found at: https://www.youtube.com/watch?v=djIBY7DHKW4&feature=youtu.be

Keywords: biomedicine, drugs and medication, medicalisation, norms and values, pharmaceuticalisation, biopolitics

In contemporary Western societies pharmaceutical drugs are central to the lives of individuals. From birth to death, these substances colonise every life phase. Since the 1980s the social nature of medicines has become a field of study, notably in pharmaceutical anthropology (van der Geest 2006). Seminal work in this field (Nichter and Vuckovic 1994, van der Geest and Whyte 1989) explored the meanings of pharmaceuticals, how their use conveys ideologies and values, and the way they transform social dynamics. In anthropology (Nichter and Vuckovic 1994, Whyte *et al.* 2002) as in sociology (Cohen *et al.* 2001), scholars have proposed a biographical approach to the study of pharmaceutical drugs that considered these as both material and cultural objects inherent to a lifecycle, from the starting point of their production (design in the laboratory, development and marketing) to their distribution (prescription and dispensing by professionals), and finally to their daily consumption by laypeople).[1]

Recent key trends since the emergence of the concept of pharmaceuticalisation in sociological and anthropological studies include the analysis of the pharmaceutical industry's regulatory practices (Abraham 2010, Abraham and Lawton 2003, Abraham 2010) as well as the study of the unequal production and distribution of pharmaceuticals in developing countries (Petryna *et al.* 2006). The focus on users as consumers has also raised the issue of how patient groups engage with pharmaceutical companies (Conrad 2007, Williams *et al.* 2011). Furthermore, the connections between new developments in bioscience and political debates raise questions on the role of the pharmaceutical industry in biocapitalism (Bell and Figert 2015, Clarke *et al.* 2010, Rose 2007).

It goes without saying that drugs are fundamental to the theoretical framework of pharmaceuticalisation (Abraham 2011, Bell and Figert 2015, Williams *et al.* 2011, Williams and Gabe 2009). However, they are also paramount in theories of biomedicalisation (Clarke *et al.* 2010) and biopolitics (Rose 2007). Indeed, they are central to the notion of molecularisation, as described by Rose, through what he refers to as 'neurochemical selves' (Rose 2007: 187). Likewise, Clarke *et al.* consider drugs to be the 'most dominant and portable mechanisms of biomedicalisation' (2010: 44). Yet, in these theoretical frameworks pharmaceuticals tend to be mainly conceptualised as material avatars of larger social forces. In fact, most studies on pharmaceuticals within these theoretical frameworks focus on macro-analyses of structures, institutions and collective actors that produce, market, dispense and use drugs.

Although these perspectives are sound and indispensable, to better grasp the extensive use of pharmaceuticals beyond the medical sphere there is also a need to focus on drugs as living objects and actors (Fraser *et al.* 2009, Martin 2006, Persson 2004). According to Fraser *et al.* (2009: 124):

> In framing and indeed shaping lives, drugs are social and political agents. In a strange way, they too have lives – as much as we live through drugs, they live through us.

This inductive and ethnographical approach is seen as paving the way to a reflection on the connections across the different arenas or dimensions of drugs trajectories: production, regulation, marketing, dispensing or use. Yet this approach has so far mostly produced discrete case studies of specific pharmaceuticals at different stages of their biography, while expressing ambivalence towards any form of generalisation or theorisation about drugs, envisaged as both subjects and objects. Indeed, we are warned that:

> Medications must be analyzed ... in their specificity, and any connections with other health issues or generalizations about the action of medicine must be built *outwards* from each specific case – carefully and with close attention to difference. (Fraser *et al.* 2009: 128)

Yet there must be some form of middle ground between these two major trends in the literature. The goal of this article is thus to invest this interzone by proposing a theoretical framework that will shed some light on the role of medications per se in transforming perspectives and shaping contemporary subjectivities. This article is programmatic in that it does not claim to be exhaustive and should be envisioned as a first iteration of a wider research agenda. It outlines the significant role played by drugs in three core processes of social transformations in contemporary Western societies: those of medicalisation, molecularisation and biosocialisation.

The following pages discuss, using a series of specific examples, the manner in which medications play a significant role in those three central processes of contemporary social dynamics. The article highlights the ways in which they operate to transform the social and medical

gaze towards what is normal and pathological, and natural and artificial, and the processes of inclusion and exclusion. The article ends by proposing three core characteristics of pharmaceuticals that distinguish them from other medical technologies and that help explain their relative omnipresence in contemporary western societies. But first comes a short section setting and delimiting the terms of this inquiry.

Setting the terms: the dimensional shift of medicalisation, molecularisation and biosocialisation

Drugs can be envisaged as major devices of a pharmaceutical regime, defined as 'the networks of institutions, organisations, actors and artefacts, as well as the cognitive structures associated with the creation, production and use of new therapeutics' (Goodman and Walsh 1993, cited in Williams *et al.* 2011: 2). Notwithstanding the usefulness of this concept, it may be more akin to the notion of dispositif, as used by Foucault (2004), than to the sole result of high-level scheming by powerful economic interests, which informs a significant share of the literature.

The dispositif is better understood through the accumulated effects it produces, rather than by the motives of the agents building and carrying it. It constitutes a perspective, a space of truth that will influence the way people think and act towards certain questions (such as, in this case, what to think of and how to deal with health, nature and identity). The dispositif consists of variable conceptions, practices, institutions or actors but has no direct or explicit direction (Raffnsøe 2008). Foucault described it as the strategy without a strategist, which becomes visible through its cumulative outcome, but is less clearly seen by the various – and sometimes contradictory – agents working through it (Foucault 1977). The dispositif will permeate and influence the actions of proponents and opponents to a given question or issue. In other words, a strong dispositif such as the pharmaceutical regime will structure both its praise and critique, and will ensure that subjectivities are fashioned in accordance with it, through either accepting or resisting it (Foucault 2004). In the dispositif of the pharmaceutical regime, pharmaceuticals serve as major vectors of this transformation of our collective perspective (or gaze). Medications primarily transform our gaze by creating a shift in our views on health, nature and identity, taking them from a categorical framework towards a dimensional one.

The first transformation concerns medicalisation. Following the seminal contributions of Zola (1972) and Conrad (2007), many authors have conceptualised and documented medicalisation as a shift in the boundaries between the normal and the pathological. Some insist on the transformation of the medical gaze from a clinical perspective, based on a conception of health and disease as discrete entities, to an epidemiological one founded on a distribution of continuous variables (Armstrong, 1995, Foucault 2004, Greene 2007). Armstrong very neatly summarises this transformation from a categorical towards a dimensional perspective along the normal/pathological axis when he notes: 'The problem is less illness per se, but the semi-pathological pre-illness at-risk state' (Armstrong, 1995: 401). In other words, chronic diseases are increasingly diagnosed according to numeric deviations from the normal curve and treated before symptoms appear (Armstrong, 1995, Greene 2007). Through this process, drugs contribute to the blurring of boundaries between health and illness and to the lowering of thresholds above which a medical intervention is indicated.

A second shift occurs through molecularisation. Over the last 50 years, with the emergence of molecular biology, the study of life processes has moved from a cellular to a molecular perspective. Rose defines molecularisation as the transformation of the medical gaze from the clinical to the molecular. Molecularisation occurs when medicine:

> Envisages life at the molecular level, as a set of intelligible vital mechanisms among molecular entities that can be identified, isolated, manipulated, mobilized, recombined, in new practices of intervention, which are no longer constrained by the apparent normativity of a natural vital order. (Rose 2007: 6)

Through this other (and concomitant) transformation of the medical (and societal) gaze, a blurring of boundaries occurs between living and non-living organisms, and by extension, between what is considered to be natural from what is perceived to be artificial. It is my contention that drugs play a major role in this process of transformation as to what is considered natural and artificial in everyday life, and in shifting the limit that separates ethically acceptable extensions of corporal limits from inacceptable ones.

Biosocialisation, finally, could be similarly envisaged as a transformation of the biomedical and social gaze that blurs the boundaries between the mutually exclusive notions of integration and exclusion, and of conformity and resistance to dominant social norms. Pharmaceuticals would then play a significant role in the constitution of a technoscientific identity fashioned by drug-taking as something to either embrace or reject.

Hence, central to this conceptualisation is the assumption that, through medicalisation, molecularisation and biosocialisation, the same basic mechanism is at work: that of an evolving polarity between two antinomic categories, the positions of which are constantly being redefined by the various uses of drugs, among other social forces. By examining the question from this angle, I seek to understand how these polarities evolve and the role pharmaceutical drugs play in the process. This phenomenon is far from unidirectional or tsunami-like; it neither follows a single direction nor is characterised by a regular, linear configuration.

Medicalisation and 'semi-pathological pre-illness at-risk states'

Medicalisation is surely the most recurring subject in sociology of health. A great number of studies have contributed to describing and analysing this phenomenon over the past 40 years. In its simplest form, it is conceptualised as the extension and expansion of medical jurisdiction through new spheres of social life. Medicalisation has been historically studied from two main standpoints: from the angle of professional dominance and from a definitional approach. Originating from the radical theory of medical imperialism (Illich, 1974, Navarro 1988), the notion of the professional dominance that bestowed on physicians a major role in the medicalisation process, refined itself towards a rigorous analysis of professional dynamics (Freidson, 1970, 1988). Research interests included the issues of autonomy and clinical judgement in the context of evidence-based medicine, as well as doctor–patient relationships (Collin 2010). The definitional approach, first introduced by Zola and Conrad, is focused on a conceptualisation and redefinition of the boundaries of illness and of the nosographic tools used in institutional processes, together with technoscientific developments and their political and economical underpinnings. Since Conrad and Zola's foundational works were published, numerous studies have followed this definitional path, exploring the medicalisation of aging, sexuality (perhaps most notably pertaining to erectile dysfunction) as well as emotions and behaviour such as depression, attention deficit and hyperactivity disorder (ADHD) and shyness. In this section of the article, I focus on the definitional approach of medicalisation. My goal is not to provide a synthesis of the studies related to this approach, but instead to focus on the mechanisms underlying the reconceptualisation of health and illness from a categorical to a dimensional perspective, using as an example the case of hypertension.

Against the backdrop of a series of transformations (including the worldwide growth of the pharmaceutical industry, the development of medical specialties, the institutionalisation of epidemiology and health promotion) and the proliferation of population health surveys, the mid-20th century marked the beginning of a major reconfiguration of the relationship between signs, symptoms and pathologies (Clarke *et al.* 2010, Conrad 2007). Normal curves soon provided statistical benchmarks for identifying at-risk groups (Armstrong, 1995, Greene 2007).

Before the 1970s, no effective treatment made it possible to control high blood pressure in individuals.[2] However, in the 1970s the publication of a randomised study, the first to be founded on a large population survey, showed the positive impact of high blood pressure control on the morbidity and mortality associated with cardiovascular diseases (Veterans Administration Cooperative Study Group Antihypertensive Agents 1970). This same period marked the arrival on the market of therapeutic agents that effectively controlled high blood pressure. Thus, screening rose to the top of medical concerns. What is considered high blood pressure has changed since the 1960s (Wang and Vasan 2005) for two reasons. The first corresponds to the progressive lowering of the thresholds that constitute abnormal blood pressure. The second is the multiplication and increasingly complex assessment of risk factors accompanying hypertension that are likely to lead to coronary disease (Will 2005). Both have contributed to progressively widening the arena in which medicine and public health intervene.

In 1999 High Blood Pressure Guidelines were published, distinguishing categories of hypertension, which were established according to associated risks (World Health Organization-International Society of Hypertension Guidelines Subcommittee 1999). Risk levels varied according to the patient's condition and were associated with each category of high blood pressure, ranging from low (systolic blood pressure [SBP]: 140–159 or diastolic blood pressure [DBP] 90–99 mm Hg), to moderate (SBP: 160–179 or DBP 100–109 mm Hg) to high (SBP > 179 or DBP > 109 mm Hg). For example, a diabetic person showing high blood pressure in the low category was nevertheless assigned a high level of cardiovascular risk. Increasingly, however, a distinction was made between individuals who do not suffer from hypertension and those who have optimal blood pressure (< 120/80), as well as from those whose pressure is deemed to be normal (120–129/80–85 mm Hg) or high normal (130–139/85–89 mmHg). In this last case there was also reference to pre-hypertension (Nesbitt and Julius 2000).

Moreover, since the studies showed that there is no threshold above which the relationship between the level of blood pressure and cardiovascular mortality is not statistically significant, experts conclude that the lower the blood pressure, the lower the risk of cardiovascular incident (Moynihan 2010, Ritz 2007). Strictly following the recommendations issued in these guidelines means that most of the population is considered to be above the norm, which is established not according to the population's normal distribution curve, but to an ideal target. Immediately questioning whether average values should comprise the norm, the authors of an article on this issue observed that the blood pressure values of isolated populations having maintained a primitive lifestyle were much lower than those of contemporary Western populations: 'This raises the question as to whether average Western values should be regarded as normal' (Law and Wald 2002: 1573).

Thus, although recent American High Blood Pressure Guidelines (James *et al.* 2014) recommend less strict blood pressure goals for older adults, the category of normal blood pressure is now defined as < 120/80 mm HG, and that of pre-hypertension (120–139 or 80–89 mm Hg) including categories that were previously defined as normal and high normal in the 1999 Guidelines.

In fact, the idea that prevention – the first line against disease – can avoid the accumulation of a confirmed health problem or even pre-empt its appearance serves as a starting point for

detecting and diagnosing potential problems as pre–problems or proto-diseases (Rosenberg 2007), as the very notion of pre-hypertension illustrates (Moynihan 2010).

The conceptualization of high blood pressure is very clearly seen here from a dimensional rather than categorical perspective. Indeed, being increasingly used before health problems appear, medications play a major role in blurring the boundaries between the normal and the pathological and lowering the threshold for medical intervention. In fact, the risk itself becomes a disease to target and on which prescription drugs will intervene (Dumit 2012).

The case of statins used in the treatment of hypercholesterolaemia further illuminates the role played by medications. Indeed, there is a progressive lowering of the threshold for intervention, that is, the recommendations to proceed, or not, with statin therapy. Guidelines for the management of dyslipidemia published in 2013, which raised important debates among clinicians, could lead to a significant increase in the number of patients for whom statins are indicated (Park 2014). Many other examples can be found to illustrate the role of medications in the management of risks and the lowering of thresholds for intervention, one of which being HIV 'treatment as prevention' (Alert n.d.)

Once the problem is made public, the marketing of new medications catalyses the reorientation of the targeted population's normative expectations and thus starts playing an integral part in defining the boundaries of this nosological entity, paired with identifying and marketing its solution. It is clear how drugs contribute to the blurring of the border between what is normal and pathological in these situations where treatment thresholds for medical intervention are steadily lowered.

Molecularisation: drugs and the extension of human limits

A similar process of dissolution of the great divide between two dichotomous categories has occured through the molecular perspective that characterises contemporary societies. Debates are numerous as to the breaking down of the boundaries between nature and culture or nature and artifice (Bensaude-Vincent and Newman 2007, Miah 2008, Rheinberger 2000, Rose 2007). In fact, it is increasingly harder to maintain that these are substantial and antinomic categories in the face of developments in genetics, stem cell research and so on. Franklin (2000) suggested that decoding the genomes of plants, animals and humans and placing them under the aegis of corporate capital has lead nature to become denaturalised. Thus, many authors suggest using the concepts of 'nature-culture' (Haraway 2004) or 'naturecultures' (Latimer and Miele 2013) since these two categories are co-constitutive entities and are defined only in relation to one another. Indeed, nature and culture can be understood as two poles of orientation in an inhabited world, and not as discrete, alternative categories.

However, while for some authors the ontological distinction between nature and culture is henceforth fictional; that is, if such a distinction ever existed, it must be acknowledged that because of their philosophical and moral scope and their inevitable impact on our use of medical technologies, we cannot relegate these categories to the status of 'popular prejudices or that of an irrational nostalgia of the past' (Bensaude-Vincent and Newman 2007: 3). Rather, nature and culture are at opposite ends of a spectrum. Even though they may be fictional, they constitute the poles of an evolving polarity that bind a society's views on what is natural and what is artificial.

The concept of molecularisation introduces a new dimension with regard to medicalisation, which is intimately linked to Clarke's theory of biomedicalisation (Clarke *et al.* 2003, 2010) and to what Rose (2007) designates as the politics of life itself. According to these authors,

there is an epistemological rupture – or at least a 'step-change' (Rose 2007: 4) rather than a simple accentuation of the phenomenon – between medicalisation, which characterises a large part of the 20th century, and biomedicalisation in the era of vital politics that characterises the 21st century. According to Rose, this vital politics:

> Is neither delimited by the poles of illness and health, nor focused on eliminating pathology to protect the destiny of the nation. Rather it is concerned with our growing capacities to control, manage, engineer, reshape, and modulate the very vital capacities of human beings as living creatures. (Rose 2007: 3)

Indeed, the suffix bio in biomedicalisation signifies the major influence that molecular biology acquired, from the 1950s, on the body of knowledge and practices in the fields of life sciences, medicine and therapeutics. The development of molecular biology set forth a change of scale within the clinical and scientific gaze and a significant increase in our capacity to modify, transform and improve our metabolism, organs, body and brain.

However, molecularisation, which is accompanied by an ensemble of political, economic, cultural, social and identity-related mutations or transformations, also constitutes a style of thought (Hacking 1992). In other words, molecularisation does not only drive the use of new technologies or scientific knowledge; this process also introduces more fundamental transformations in manners of thinking, considering and interpreting phenomena and their respective solutions (Hacking 1992).

Yet, some authors ctiticise the biomedicalisation or molecularisation thesis for being too totalising (see specifically Latimer [2013] in *The Gene, the Clinic and the Family*, as well as the debate on geneticisation between Kerr (2004) and Hedgecoe (2004). Latimer and Kerr insist that the thesis over-emphasises changes in the clinic (clinical gaze and diagnostic reasoning) following advances in molecular biology and genetics. According to these authors, the molecular era is more a continuation of than a rupture with the preceding one.

Nonetheless, through precise interventions at the molecular level, the delineations of what is natural and what is artificial are constantly being redefined. According to Nikolas Rose: 'In principle, it seems, any element of a living organism – any element of life – can be... manipulated and recombined with anything else' (Rose 2007: 83). Imagining a society at a molecular level entails the possibility of 'remaking life and death' (Franklin and Lock 2003) and extending human limits. New reproductive technologies (including artificial uteri), which permit the reprogramming of the beginnings of life on one end and driving back the aging process on the other, are emblematic of the transformation of the technoscientific and medical gaze on life itself. Molecularisation is accompanied by a process of geneticisation, reflecting a promise of customised and personalised medicine through pharmacogenetics (Hedgecoe and Martin 2003). Paradoxically, the promise of hyper-individualisation through the genetic decoding of individuals coexists with complete depersonalisation. Indeed, bodily products (including cells, tissue and DNA fragments), as well as organs, have become bio-objects detached from the social identity of the bodies from which they are harvested and commoditised. Although many authors have considered the processes of molecularisation and geneticisation – as well as the possibilities of extending human capacities – as leading to the production of robotised bodies, even cyborgs (Haraway 2004), Rose proposes that, within the dynamics of the politics of life itself, the shaping of the bios must pass through interventions on the zoë, rendering individuals not less, but more biological:

> [T]he new molecular enhancement technologies do not attempt to hybridize the body with mechanical equipment but to transform it at the organic level, to reshape vitality from the inside. (Rose 2007: 20)

However, in acting on the molecular biology of individuals, drugs also hold the potential to contribute to the extension of the limits of the human body. Because of their materiality and their wide accessibility, they operate on a far larger scale than other medical technologies, such as assisted reproductive technologies, which to be implemented require a complex medical setting and expertise. Drugs embody, in a metonymical fashion, all the medical expertise underlying their design, thus allowing their autonomous impact on the lifestyle of individuals. Therefore, drugs are likely to play a significant role in the reconfiguration of the boundaries between nature and culture in everyday life, for example, through menstrual suppression or sleep elimination.

Originally designed to control health problems, combined hormonal contraceptives for menstrual suppression (CHCs, mostly oral contraceptive pills) are increasingly used for reasons of comfort and lifestyle (Hitchcock 2008). Indeed, they are particularly popular with young women (Gerschultz *et al.* 2007). Because they are taken over a long period of time, CHCs modify what is conceptualised as the natural functions of the body. Although some women worry about the side-effects of these contraceptives and the reversibility of their impact on the body, many seek to take advantage of their benefits (Repta and Clarke 2013). A Gallop survey of female obstetrician-gynaecologists revealed that, in 2003 53 per cent considered this means of contraception to be safe and used it themselves, from which we may assume their propensity to offer oral contraceptives to their patients (Hitchcock 2008: 707).

However, beyond its lifestyle appeal, menstrual suppression is increasingly seen as an appropriate measure for women in certain lines of work, such as military personnel in the deployed environment. According to a recent study on the subject, CHCs can 'contribute to the appropriate pre-deployment women's health care and improve the readiness for deployment in female soldiers' (Trego and Jordan 2010: 287). Continuous contraception is also 'associated with significantly improved compliance and significant reductions in specific menstrual burdens' (Powell-Dunford *et al.* 2009: 971).

Thus, for many women, the social imperatives of productivity extend beyond any personal freedom from the bodily limitations imposed by menstruation. It is on the basis of such arguments that the debate around menstrual suppression arose, starting in the 1980s. These insist on the cost of lost work due to menstruation (Hitchcock 2008). Indeed, feminist analyses, such as Lippman's (2004), state that the ideology of productivity in a capitalist society leads the female body to be considered a dysfunctional machine.

According to Brazilian gynaecologist Elsimar Coutinho, a fervent advocate of the obsolescence of menstruation (Coutinho and Segal 1999), who was involved in developing the drug Depo-Provera, menstruation constitutes a waste of resources for today's women. According to his very personal interpretation of history, Western women are not expected to reproduce at the same pace than in past centuries (even millennia) to ensure the survival of the human species. While in the past women spent much of their reproductive lives either pregnant or breastfeeding – both situations that interrupt menstruation – this is no longer the case today. Over their lifetimes, contemporary women experience hundreds more menstruations than their ancestors, needlessly weakening them and sapping their energy.

Hence, Coutinho's basic argument is a return to the laws of 'nature,' by referring to a past when life was structured around biological imperatives and reproduction (Hitchcock 2008, O'Grady 2007). Through this inversion of perspective, CHCs, which are a chemistry-based

technology, would allow returning to a natural order of things, thus shifting the boundaries between the natural and the artificial.

Elimination of the need for sleep by modafinil, a drug originally designed to treat narcolepsy, can also be considered appealing in the bio-capitalistic perspective of seeking hyper-productivity and performance, and aiming to conquer the sleeping body as much as the waking body (Coveney *et al.* 2009, Williams *et al.* 2008). Beyond an individual's desire to free themselves from the limitations imposed by the need for sleep, an argument is developing in support of the mandatory use of this medication in the context of certain occupations requiring around the clock alertness, for instance, in military operations (Eliyahu *et al.* 2007, Williams *et al.* 2008). Indeed, a recent study indicates that off-label use of modafinil increased 15-fold between 2002 and 2009 in the USA (Peñaloza *et al.* 2013).

In the case of suppressed menstruations or the elimination of the need to sleep, the process at work reaches beyond a simple desire for optimisation or enhancement through micro-manipulations aiming at transforming bodies and selves for lifestyle promotion. As bio-politics are orchestrated to make these drugs not only accessible but potentially obligatory in certain contexts, namely in the workplace, one can envision a collective exemption from certain physical limits progressively setting into place as it moves the boundary between the natural and the artificial.

Pharmaceuticals then follow the same itinerary, whether the issue at hand is menstrual suppression or sleep elimination. Initially approved for specific health problems, the demand for these drugs quickly rises to support lifestyle and personal choices. Their mandatory use is then contemplated in certain work settings while scientific arguments, justifying a generalised use in the name of health, public safety and the good of society, proliferate. The extent to which that drug-taking is systematised (organised, collective and mandatory) to extend the body's limits will ultimately have the effect of naturalising bodily states that would have been, until then, considered artificial.

Biosocialisation: drugs and the tension between conformity and resistance

According to this model, biosocialisation may be conceived as a mechanism through which there is a progressive superimposition of two antinomic conditions: inclusion in and exclusion from society. While there has always been a tension between inclusion and exclusion, it is increasingly common for individuals to be fully integrated in a community while simultaneously marginalised or stigmatised by society.

This dimension directly calls upon the concepts of biosociality (Rabinow 1996) and bio-citizenship (Petryna *et al.* 2006, Rose and Novas 2005). As stated by several authors, there is a reshaping of collective identities in contemporary Western societies through the genetic, somatic or physical attributes that individuals share and around which they are mobilised (Clarke *et al.* 2010, Rose 2007).

However, we can also envisage the shaping of collective identities through attitudes towards pharmaceuticals and the ways in which individuals organise their shared experiences in relation to them (Hardon *et al.* 2013). Drugs serve as catalysts when they become the object around which new socialities appear, be it through non-medical or illicit use, as in the case of cognitive enhancers (also called smart drugs), or through the rejection of a diagnostic label and subsequent treatment, as in the management of extreme shyness with psychotropic drugs. Pharmaceuticals would then play a significant role in building collective identities through individuals sharing their experiences related to consuming the drugs or, on the other end of the spectrum, their refusal to use them.

Thus, through the construction of individual and collective identities, there is also a tension between conformity – via a standardisation and normalisation of behaviour and appearances – and resistance to this homogenising force. Indeed, the relationship between these two poles is made more complex in that it leads to a reflection on the tensions between specificity and standardisation, a late modern version of Norbert Élias' civilizing process (Élias, 1994), where the requirements of conformity to the ways of relating to others are an inherent paradox. The valorization of autonomy that characterises contemporary Western societies implies that individuals must be themselves as much as possible (Ehrenberg 2010). They have to constantly re-edit their image, and perform and obtain recognition for their distinctiveness. However, at the same time, they have to conform to social norms. Georg Simmel aptly captures this ambivalence in his analysis of fashion (Simmel and Wolff 1950). According to Simmel, fashion incarnates the tension between social imitation on the one hand – being fashionable means following the trends – and, on the other, being concerned with individual distinction – building, preserving and developing one's image, and expressing it through fashion. Aspiring to be as much oneself as possible, in fact, means meeting social expectations for performance and autonomy. In societies where the somatic is a powerful dimension for uniting individuals around a common identity, conformity – via a standardisation and normalisation of behaviour and appearances – and resistance – to this homogenising force – are the two ends of a continuum underlying the process of biosocialisation.

This tension between inclusion and exclusion, as well as between conformity and resistance is exemplified by the cases of extreme shyness on one end, and of the non-medical use of cognitive enhancers on the other.

Extreme shyness first appeared in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) III in 1980 under the label of social phobia. The prevalence of social phobia (labelled social anxiety disorder (SAD) in more recent editions of the DSM) was then estimated to be between 1.2 and 2.2 per cent of the total population (Horwitz 2010). Ten years later this was revised to 13 per cent. This rise is partly due to a reduction of diagnostic criteria – in numbers as in severity, making them more inclusive – but also to the marketing of antidepressants approved for the treatment of social phobia (Collin and Otero 2015). Wide commercialisation of these drugs confers a deep social resonance, a tangible reality, to extreme shyness, bolstering its public awareness. Social phobia is a good example of the co-construction of a new 'disease' via the mutual influence of psychiatrists, patient groups and pharmaceutical companies (Horwitz 2010, Lane 2007, Scott 2006).

However, the medicalisation of this condition does not constitute its most intriguing aspect. Rather, it is this tension between conformity and resistance. While some people find a new social space in patient support groups, allowing for collective learning from the personal experiences of others, numerous websites aim to resist the label of SAD or even of shyness – and to assert the specificity of its followers as introverts. Interestingly, the mediatised translation of this concept in popular discourse is no longer extreme shyness, but simply shyness. The issue today is how to distance oneself from the stigma of the shy label and embrace the introvert identity. Websites providing information and support are indeed very important in forging a collective identity that redefines shyness or introvert behaviour outside the realm of medicine. For introverts, the plague is not the illness but the necessity to conform to the norm of extroversion, sociability and loudness. Enjoying solitude and quiet endeavours is not what is currently socially valued, as this quote, taken from a website where patients and physicians share information and experiences, demonstrates:

> So, the ex's have it. Extraversion IS the norm. Introverts are the outsiders, struggling to fit into a world set up for the numerical majority. (McManamy 2010)

Redefining identity in physiological and molecular terms, through describing how the brain works differently for introverts and extroverts, is rather common on blogs and support websites:

> Introverts have more brain activity in their frontal lobes and when these areas are activated through solitary activity, introverts become energized through processes such as problem solving, introspection, and complex thinking… There's a deeper science to this that involves differences in the levels of brain chemicals such as acetylcholine and dopamine in extroverts and introverts, but I won't get into that. (ProperlyChastised, n.d.)

Thus, introverts would also define themselves as neurochemical selves, albeit of a different neurochemical kind, and seek social approval of that difference. Even further, the idea is to convince others that society needs introverts, that they can make it a better, more balanced place. This movement is unmistakably expanding, with the publication by former lawyer-turned-writer Susan Cain's (2012a) book *Quiet: The Power of Introverts in a World That Can't Stop Talkin*). The TED Talk she presented in 2012 has attracted 9 million views and earned a place among the top 20 most viewed talks (Cain 2012b). The author also manages a webpage and a blog on introvert empowerment (Cain n.d.) and has 49,000 followers on twitter. According to Cain, introverts think more deeply, concentrate better, are more inventive, more insightful, and more sensitive and moral than extroverts. Several other support groups sites (such as Quietly Fabulous, n.d.) and self-help books adopt a similar direction (Ancowitz 2010, Wagele 2006).

In this case, there is much more than a process of medicalisation or de-medicalisation at play. Both the social critique and the affirmation of a radically different and marginal identity vis-à-vis the norm accompany a claim for integration into society. However, this identity is also forged in opposition to the one defined by the DSM and widely disseminated through direct-to-consumer-advertising for prescription drugs.

With regard to the case of cognitive enhancers or smart drugs, it is not the refusal of medical use but rather the non-medical use of medications that is of concern. Among the pharmaceuticals that are used as cognitive enhancers, methylphenidate, amphetamine salts and modafinil are most often referred to. Over the last decade an increase in the use of psychostimulants among college and university students has been observed, notably to improve academic performance, comply with expected standards, facilitate social interactions and better answer cultural norms concerning behaviour and appearance, for example, by using psychostimulants to lose weight (DeSantis *et al.* 2008, Quintero 2009). Most ethical debates on the use of smart drugs raise the question of the normative and moral boundary between students who take part in such practices and those who do not (Cakic 2009, Greely *et al.* 2008). However, other issues are also directly related to this phenomenon, such as the multiple sources of information available on drugs and drug use, as well as the influence of peers on the construction of practices. DeSantis *et al.* (2008) observed that most illicit users of ADHD medications had limited knowledge about these drugs and their effects. Their main sources of information were the narratives of their peers' experiences and their accounts of these medications as 'miracle' or 'study' drugs.

Yet, it is warranted to contemplate the phenomenon of non-medical use of psychostimulants through the lens of body projects that must lead to academic success in the context of a competitive ethic. In contemporary Western societies, the body is the path though which identities are exposed and expressed (Rose 2007). The project of the self is in many respects also a body project, which is related to self-management and embodied control. The logic of performance and the requirements for control that exist in the academic setting seem to converge

towards what Davis (2009: 40) calls the 'enterprising of the self'. This refers to the logic of productivity within which an individual must develop their capacities to the maximum and become successful in every sphere of their life, be it social, academic or related to health and the body.

Thus, having control over one's health, body and performance can signify, for some, not having to take any medications (Collin *et al.* 2012). Conversely, for others, the use of pharmaceuticals allows the attainment of maximum performance levels and, consequently, control over body and health. Through pharmaceuticals the body becomes instrumentalised. It can be put to sleep or stimulated at will; it can be reprogrammed in a way that allows individuals to answer to the performance requirements that weigh them down. Thus, while illicit users of ADHD medications are those who most intensely adhere to the competitive ethic found in academia, can they truly be considered deviant and marginal or are they rather more closely assimilated to the neoliberal ideology of productivity and performance that characterises Western societies? In the case of smart drugs, as with shyness, pharmaceuticals reveal themselves as powerful devices for shaping identities and blurring the boundary between inclusion and exclusion, as well as between conformity and resistance.

Conclusion

In this article I have suggested that drugs are major devices of the dispositif of the pharmaceutical regime that characterises contemporary Western societies. Pharmaceuticals play a significant role in the transformation of perspective (or gaze) that characterises medicalisation, molecularisation and biosocialisation. They achieve this by shifting our views on health, nature and identity from a categorical to a dimensional framework. Thus, central to this conceptualisation is the assumption that the same basic mechanism is at work in these three processes. This does not entail that pharmaceuticals are the only devices able to act on our conception of nature, illness and identity. However, the reason they play a crucial role in this process is that they colonise every sphere of contemporary social experiences, reaching far beyond the medical realm. Therefore, I would like to conclude by proposing that three characteristics distinguishing drugs from other medical technologies significantly contribute to the colonisation of all social spheres by pharmaceuticals.

The first is their materiality (their concreteness), which provides them with a metonymical function (van der Geest and Whyte 1989). In other words, the medical and scientific expertise is incorporated into the object itself: the pill. This is different from other medical technologies that require a medical setting (medical instruments and experts) to implement them. Both the concrete and the metonymic nature of prescription drugs allow the layperson to re–appropriate their uses and effects. This democratisation of technology bestows drugs with enormous potential for social transformation, as it facilitates shifting their use towards enhancement, such as in the case of cognitive enhancers, or other nonmedical outcomes, for example, improving one's lifestyle or answering to the demands of productivity, as in the case of menstruation and sleep suppression. Thus, this materiality increases the potential for the autonomisation of technology.

This also implies that the same molecules have different end uses (and even effects) depending on the contexts in which they are consumed. Indeed, the very same drug can be taken, as Conrad and Potter (2004) have shown, to repair, normalise or enhance. This second characteristic plays an important part in redefining the limits not only between normality and pathology, but also between the natural and the artificial as well as between inclusion and exclusion. The multiple end uses of drugs contribute to opening up the social spaces in which they circulate.

Finally, the third characteristic – temporality – is directly connected to identity. Drugs act on the individual's spatial and temporal configuration by shaping identities through practices, as we have shown in reference to biosocialisation. It is also achieved through a shift in the boundary between what is normal and pathological, while the marketing of new pharmaceuticals contributes to the creation of new 'ill in the making' identities. Moreover, the significant prevalence of chronic disease means that most medications are taken on a daily basis to control rather than to cure diseases. The positive effect disappears as soon as the medication is stopped, for instance, in the case of hypertension. The effect is thus temporary, as opposed to the permanent effects of other medical technologies such as stem cells. In this perspective, pharmaceuticals introduce a plasticity of identities because they make a certain reversibility of effects and conditions possible.

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Notes

1 Of course, there have also been an important number of anthropological studies on drug efficacy and its perception by laypeople that also emphasise the importance of context in shaping pharmaceutical efficacy, but this is not the focus of this article (see Schlosser and Ninneman 2012).
2 The situation is certainly more complex and, according to the American National Health Examination Survey (NHES), concern over high blood pressure began growing since the early 1960s. However, it was only in the mid-1970s that a real leap both in the awareness of the problem and a call to action occurred. For further details, see Greene (2007), Wang and Vasan (2005).

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