

A thousand contradictory ways: Addiction, neuroscience and expert autobiography

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Suzanne Fraser is Australian Research Council Future Fellow and Associate Professor at the Melbourne office of the National Drug Research Institute, Faculty of Health Sciences, Curtin University, Australia. She has published widely on drug issues, health and the body. Her most recent book is *Habits: Remaking addiction*, 2014, Palgrave (with David Moore and Helen Keane).

Abstract

Neuroscientific accounts of addiction are gaining increasing influence in health and medical circles. At the same time, a diverse if equally scientifically focused, opposition to addiction neuroscience is emerging. In this struggle over the merits of neuroscience for understanding addiction can be found elements of a uniquely 21st century public engagement with science, one that philosopher Bruno Latour (2013) has identified in the context of climate change. No longer trusted by the public as the unerring source of objective knowledge about the world, science is, at least in some contexts, increasingly treated as just one voice among many. Observing the difficulties this loss of faith in science poses for effective action on climate change, Latour develops a different ('ecological') approach to scientific knowledge, one that for the first time allows scientists (and other 'moderns') to understand and value it for what it really is, and locate it 'diplomatically' alongside other modes of knowing. In this article I ask whether a similar innovation is needed to allow more effective understanding of and action on addiction. I explore this question by analysing two recent, widely discussed popular books (Lewis, 2011, *Memoirs of an addicted brain*, and Hart, 2013, *High Price*), also drawing on reviews of these books published in mainstream media outlets. Both written by neuroscientists, and both drawing heavily on personal memoir to illustrate and ratify their competing views on drugs and addiction, the books crystallise contemporary dilemmas about science, empiricism and the nature of evidence and truth. How are we to understand the mix of 'scientific fact' and individual self-observation in them, what does this mix suggest about all scientific knowledge, and what are its implications for dominant notions of 'evidence-based' drug policy and treatment? In concluding I argue that these books both trouble and reinforce our taken-for-granted distinctions between science and personal stories, between objectivity and subjectivity, and I note the lost opportunities the books represent (especially in Hart's case) for a more searching and productive (Latour might say 'ecological') engagement with science.

A thousand contradictory ways: Addiction, neuroscience and expert autobiography

The Moderns have never been modern, but they have believed they were modern, and this belief [...] is crucial, for it has made them act in a thousand contradictory ways that we must learn to sort out (Latour, 2013: 14)

Neuroscientific research is gaining increasing influence in health and medical debate and policymaking (Netherland, 2011; Rose and Abi-Rached, 2014). Colourful brain images dominate science magazines, newspapers and television coverage of health problems, and terms such as ‘neural firing’, ‘neural pathway’ and ‘reward system’ now litter scientific and popular accounts of all kinds of issues from pain to exercise to addiction. At the same time, a growing critique of this turn to neuroscience is also emerging. Some detractors argue that it places too much emphasis on the brain in explaining subjective bodily experience (Satel and Lilienfeld, 2014), others that it oversimplifies the mind and the nature of what it is to be human (Tallis, 2011), and others still go further again, treating it as one more example in a long line of hyperbolic scientific claims making (Brosnan and Michael, 2014). In this struggle over the validity and merits of neuroscience can be found elements of a uniquely 21st century public engagement with science, one that recent work by science and technology studies scholar Bruno Latour (2013) has also identified in a very different context: that of climate change. No longer trusted by the public as the unerring source of objective knowledge about the world, science is coming to be treated as just one voice among many. Observing the difficulties this loss of faith in science poses for effective action on climate change, Latour aims to develop a new approach to scientific knowledge, one that for the first time allows scientists (and other ‘moderns’) to understand and value it for what it really is, and locating it ‘diplomatically’ alongside other modes of knowing.

In this article I ask whether a similar innovation is needed to allow more effective engagement with drug use and related ideas of addiction. I explore this question by analysing two recent, widely discussed popular books (Lewis, 2011 and Hart, 2013), also drawing on reviews of these books published in mainstream media outlets. Both written by neuroscientists, and both drawing heavily on personal memoir to illustrate and ratify their competing views on drugs and

addiction, the books crystallise contemporary dilemmas about science, empiricism and the nature of evidence and truth. How are we to understand the mix of 'scientific fact' and individual self-observation in them, what does this mix reveal about all scientific knowledge, and what are its implications for dominant notions of 'evidence-based' drug policy and treatment? As I explain, questions of truth and evidence are never thoroughly addressed in the books. Instead, both authors mobilise personal stories alongside formal scientific research in ways that would seem to contradict their stated adherence to objective 'facts' and the proper ways of producing them. In this respect, these two successful scientists can be said to adopt an epistemological strategy (that is, the use of anecdote and personal convictions to establish truth) for which non-scientists are regularly criticised by scientists. Why do they do this, and how successful are they in readers' eyes? These are two of the key questions I seek to answer here. In exploring these questions I also speculate briefly on a further, equally important, one: what would addiction look like if Latour's desire to better characterise and comprehend different modes of knowing were applied to it? The article concludes by highlighting the tensions and contradictions in our taken-for-granted distinctions between science and personal stories, between objectivity and subjectivity, returning to Latour's work to help outline a way of thinking about science in general and the neuroscience of addiction in particular that allows recognition of its uses without demanding an uncritical faith in simplistic understandings of scientific 'evidence' and 'objectivity'.

Background

Definitions of addiction and the best ways to respond to it have varied significantly over time, and remain multiple and contested. The social science literature on the history and contemporary trajectory of the concept is extensive and has diversified over time to acknowledge the rather different articulations of addiction that occur depending upon the substance under discussion (alcohol, heroin, tobacco and so on), other issues such as race and gender, and political and cultural variation across time and place (see Fraser, Moore and Keane, 2014 for a detailed discussion of this history). Some scholars have, for example, argued that the notion of addiction emerged alongside Enlightenment notions of reason and rationality (e.g. Sedgwick, 1994; Derrida, 1993). In this sense, addiction and modern society can be seen to have made each other, and to

continue to rely upon each other for meaning (Fraser and Moore, 2011). Redfield and Brodie (2002, p. 2) give the example of regular and heavy drinking in the US, which went un-labelled as 'addiction' for centuries prior to the emergence of the necessary political conditions for the generation of the label. This chronology of labelling is also reflected in the legal history of the term 'addictive substance'. Not until the 20th century were drugs criminalised in the US, Great Britain and Australia. This criminalising reflex developed out of two conceptual sources: 1) powerful typologies of deviance generated by the emerging disciplinary society (and the associated rise of the 'psy' disciplines), and 2) the emerging ethos of consumption (Redfield and Brodie, 2002; Room, 2003). This confluence of pathologising categories and expanding consumption meant that the 20th century not only embraced the idea of addiction: it produced it in myriad forms (Courtwright, 2001).

Perhaps the most recent and influential form taken by the idea of addiction is that offered by neuroscience. As do all knowledges, the neuroscience of addiction has political origins. The 1970s saw illicit drug use targeted in the United States as a primary cause of social disorder. The Nixon government responded in part by funding basic scientific research into addiction, mainly through the National Institute on Drug Abuse (NIDA). Across the 1980s and 1990s this research came to focus increasingly heavily on neuroscientific methods and frameworks. In so doing, new biological truths about the brain – about neurotransmitters and receptor sites for drugs – were created (Vrecko, 2010; Courtwright, 2010). At the same time, the advent of new imaging technologies enabled cheaper and easier study of the brain (Campbell, 2007). As Vrecko explains (2010, p.61), these developments allowed researchers to form a 'new neurobiological problem space' and situate addiction within it.

While social and cultural factors are sometimes acknowledged within this field as contributing to addiction, the 'brain reward system' is the main focus of the new approach to addiction. According to neuroscience, the brain's reward system evolved in order to reinforce behaviours geared towards survival – sex and eating being primary examples (Hyman, 2005). These activities prompt the release of the neurotransmitter dopamine, producing sensations of pleasure. Addictive drugs are said to 'hijack' this reward system by binding to the same receptor sites in the brain and producing intense sensations of pleasure (Robinson & Berridge, 2003). As

the brain adapts to the presence of a drug, its circuitry changes, further reinforcing the effects of the drug. According to NIDA scientists Volkow (now NIDA Director) and Li (2004, p.163), this is 'the neurobiology of behaviour gone awry'.

Greeted by some as a valuable new approach to addiction, this neuroscience model has also prompted scepticism among researchers and clinicians. As Rose and Abi-Rached (2014) point out, the promise that neuroscience would revolutionise medicine has so far failed to materialise. Courtwright (2010) makes a similar observation. He also notes that common claims that addiction neuroscience will destigmatise drug users and challenge prohibitionist drug policy are not proving correct. Despite these limitations and disappointments, neuroscience continues to expand into the domain of addiction, taking in so-called behavioural addictions and those that defy strict classification such as overeating and obesity, promising rewards in the future should scientists be allowed to continue the quest for knowledge (Fraser, Moore and Keane, 2014). It is from within this burgeoning scientific field, expansionist in ambition, thoroughly modern in outlook, but yet to bear the fruit that would justify this ambition and outlook, that the two books I examine here have emerged.

Theory: From 'modernising' to 'ecologising'

In his recent book, *An Inquiry into Modes of Existence* (2013), Bruno Latour talks about the difficulties science now faces in inspiring public faith or respect. He outlines a body of thought he and other scholars have developed over several decades, one in which the precepts and aspirations of the modernist project in general, and scientific practice in particular, function as a kind of receding horizon in relation to which scientists and others committed to rationalist epistemologies present themselves as proponents, and producers, of objective, value-free knowledge about the world. Within the modernist mode of thought (and, as we will see, of *existence*), the institution of science is accorded an unquestionable capacity to progress knowledge about the world, to inform, and to drive change for the better. If scientific consensus says climate change is real, we must accept this, and respond accordingly. Yet, this faith in science has suffered erosion in recent times. Latour tells the story of a gathering in which a respected climate scientist is challenged by his audience, asked why scientists should be believed

over others who reject the idea that climate change is caused by human activity or exists at all.

Latour is rather disturbed by this 'impudent' line of questioning:

Has the controversy really degenerated to the point where people can talk about the fate of the planet as if they were on the stage of a televised jousting match, pretending that the two opposing positions are of equal merit? (Latour, 2013, pp. 2-3)

Faced with the erosion of faith in scientific certainty as exemplified by this scepticism about climate change, Latour wonders how scientists should respond, and is taken aback by the tack taken by the scientist in the climate change meeting. Instead of reasserting the scientific facts of climate change and their indisputability, the scientist refers to faith: the need to trust the institution of science:

to my great surprise, he responds, after a long, drawn-out sigh: 'If people don't trust the institution of science, we're in serious trouble.' (Latour, 2013, p. 3)

In other words, Latour explains, the scientist answers the question by mobilising the notion of institution. This is, it seems, 'the best instrument for measuring the respective weight of the positions...And this is why he adds that "losing trust" in this resource would be, for him, a very serious matter.' (2013, p. 3)

Why does Latour's scientist take the approach he does? Why does he not simply invoke scientific certainty – sternly remind the questioner of science's unarguable facts about the climate? As Latour explains,

Five or ten years ago...he would have appealed to certainty, a certainty whose origin he would not have had to discuss in detail before such an audience; this certainty would have allowed him to treat his interlocutor as an ignoramus and his adversaries as irrational. No institution would have been made visible; no appeal to trust would have been necessary. He would have addressed himself to a higher agency, Science with a capital S. (Latour, 2013, p. 3)

We do not need to take Latour to be suggesting that scepticism about scientific method and practice did not exist at all until recently (see also Wynne, 1996, and Epstein, 2000, for similar discussions) to agree that the climate change debate is a signal example of the diminishing

authority of scientific expertise. Science has, it seems, accumulated enough errors (some critics, Latour says, look as far back as the reception Galileo's theories received), enough failures of objectivity, to undermine faith. So, says Latour, the scientific expert had good reason to give the response he did:

he fell back on the means that seemed to be at hand: trust in an institution that he had known from the inside for twenty years and that he ultimately had no reason to doubt.

(Latour, 2013, pp. 4-5)

This does not mean Latour is satisfied by this response, however. Instead he is somewhat disappointed, having spent, he says, many years in his own research career examining and rethinking scientific endeavours so that scientists could be better equipped to understand and defend scientific objectivity in the complex terms it really requires:

As we saw it, scientific objectivity was too important to be defended solely by what is known by the umbrella term 'rationalism,' a term used too often to bring debate to a halt when an accusation of irrationality is hurled against overly insistent adversaries. (Latour, 2013, pp. 5-6)

As Latour and his colleagues have long known, scientists' defences of their craft are beset by conceptual problems, what he calls tensions, if not contradictions. He sees this same tendency in the scientific expert's account, which incorporates a tension between:

the value that he wants to defend—objectivity—and the account he proposes to define this value. For he seems to hesitate, in effect, between an appeal to Certainty and an appeal to Trust, two things that involve, as we shall discover, entirely different philosophies, or rather metaphysics, or, better still, ontologies. (Latour, 2013, pp. 6-7)

Here is the key observation in Latour's book for my purposes in this article. More than simply taking his expert to task, Latour develops a new definition of scientific endeavour that better reflects its complexity, and at the same time creates room for the many knowledges marginalised by scientific rationalism. The project is, he says, an anthropological one in which the 'moderns' (proponents of the Enlightenment values of reason and rationality as exemplified in science) are for the first time subjected to the anthropological gaze, and their epistemologies located alongside

instead of above or in place of those knowledges traditionally othered by anthropology. He wants, in short, to carry out a 'diplomatic' mission that would, if successful, create the conditions for a different relationship between the many epistemologies needed to allow a full and necessary engagement with the urgent problem of climate change – to shift, as he puts it, from an epistemology of the 'planet' to one of 'Gaia', from a process of 'modernising' to one of 'ecologising' (that is, of bringing into fertile balance):

Can certain of the concepts that we have learned to cherish be offered the opportunity for a type of development that the much too narrow framework of modernization has not given them? (Latour, 2013, p. 8)

Here we begin to see some similarities to the issues to be taken up in this article, similarities perhaps not immediately obvious because a key difference exists between Latour's area of concern, climate change, and mine, the neuroscientific basis of addiction. The first is an area that has not yet attracted the level of concern and action it requires – a looming crisis that has already begun to take a significant toll but against which action is hampered by those determined, due to institutional investments, to dismiss it. The second is the reverse: a new scientific domain that has quickly attracted a great deal of interest and support, but one in which the narrow action it suggests, and the agenda animating it, do indeed need further scrutiny. Both areas are alike, however, in that they are important and controversial sites of struggle over scientific certainty and of scepticism in science. Is climate change real, that is, or are scientists merely inventing or at least overstating the problem to shore up their relevance, to bind us to them ever more tightly? Can neuroscience really explain and solve addiction, or, again, are scientists inventing or overstating its uses and merits to shore up their relevance and bind us to them (and their technocratic solutions) ever more tightly? As I will go on to explain, this article will consider a striking development in scientific knowledge-making on addiction: the expert memoir of addiction, told by neuroscientists with 'first hand' knowledge of both the problem and its laboratory-based solutions. My aim in analysing these memoirs is to illuminate first the epistemological quandary that has given rise to them (the one Latour identifies) and their attempts to engender trust where certainty is not achievable, to consider the specific problems generated by their simultaneous engagement in two

different epistemologies (or, to take inspiration from Latour's recent work, 'modes of existence'): memoir and scientific evidence, and the openings this reveals for how addiction science might rethink itself more 'diplomatically' to make better and more persuasive use of its capacities in the domain of addiction.

The founding concern of Latour's approach to modernism and the scientific endeavour is much like mine: there is an urgent need to escape the fantasy that science can proceed in isolation from politics. Until the science endeavour is rethought in such a way as to allow scientists to acknowledge and actively grapple with its political dimensions, no effective comprehension of the nature of the knowledge it produces, and the relationship between that knowledge and other knowledges will be achieved. It is time to find a different 'system of coordinates' and to reformulate our values now that the modernist project is 'waning'. Objectivity is one such coordinate and value that must be rethought, and in the process, other values long 'trampled' by science might also be granted space in our toolkit of resources for action. As Latour puts it, 'If it is a question of ecologising and no longer of modernising, it may become possible to bring a larger number of values into cohabitation within a somewhat richer ecosystem.' (Latour, 2013, p.11)

It is my contention in this article that, at a time in which scientific knowledge-making is being mobilised as never before to reduce and reify addiction through specific ideas of the brain, precisely the same shift is needed on the issue of addiction. By examining in detail two recent expert memoirs on addiction neuroscience and considering the public reception of their approaches and arguments, I will tease out the accounts they mobilise of science, evidence and truth, the relationship between these and the projects the authors pursue in practice, and the gaps and tensions between the two that demand new ways of thinking through the nature and uses of scientific knowledge in a context in which naïve appeals to 'evidence-based' responses grow ever more common. As Latour observes,

The Moderns have never been modern, but they have believed they were modern, and this belief too is crucial, for it has made them act in a thousand contradictory ways that we must learn to sort out... (Latour, 2013, p. 14)

Central to this investigation is the conviction that knowledge-making about the world –

or let us say ‘world-making’ (Fraser, 2006) – takes many different forms and instantiates many different systems of perception, reasoning and veridiction (that is, truth validation according to a specific set of assumptions and criteria). This is not a problem to be overcome such that rationalism and scientific method are at last installed properly as the only valid epistemology. The perhaps inconvenient yet profoundly fertile issue to be grasped is that

there are several types of truth and falsity, each dependent on very specific, practical, experiential conditions. Indeed, it can’t be helped: there is more than one dwelling place in the Realm of Reason. (Latour, 2013, p. 18)

There are many useful instruments, to put it as Latour does (2013, p. 19), for tackling huge, seemingly intractable, issues such as climate change, and this multitude offers important possibilities for communicating and acting across cultural and other differences in making change. This article aims to do something similar with the ideas Latour canvasses – to try to sort out at least some of the contradictory ways science engages with knowledge and truth, here in the context of drugs and addiction, in order to better articulate what it does and therefore where it sits along with other systems of veridiction and what he calls ‘modes of existence’.

Before turning to the objects of my analysis, one last question remains about my approach. Why does Latour use the word ‘existence’ in his discussion? Why not modes of ‘knowing’ only? His intention is one I have elaborated extensively elsewhere (Fraser, 2013) so I will give only the briefest of accounts here. A basic premise of current science and technology studies (Law, 2004; Mol, 2002) is that says knowledges *produce* realities in a process of ongoing enactment. No single reality exists behind our many and varied struggles to know and articulate it. There is, therefore, no single truth of reality, and our efforts to know it are part of the process by which it is actually made. This idea has many implications, but it has especial resonance for issues that take in those who have been the objects of the othering truth-making of the sciences (farmers in the global south affected by climate change, for example, or consumers of illicit drugs in Australian urban centres and so on). This multiplicity means there is no room for science’s colonising insistence that it alone can account for the world. Instead we must recognise the many forms of veridiction of use in the world (Latour, 2013). In the process, however, we must also become far more literate in recognising the ‘category errors’ that take place in mobilising these forms of veridiction; in

establishing and assessing knowledges, in accepting and rejecting truths. The example he gives to illustrate these issues is an extremely clear one: the different processes of veridiction required for establishing 'truth' in law and in science. Law and science are both important knowledge-making (even truth-making) instruments, neither can be collapsed into the other, yet at many points, for example when science is used in the court room, they form 'crossings' (points of intersection or collision) that are not always recognised as the meetings of difference they are.

This article attempts something in the spirit of Latour's project. In the sections that follow, I examine two recent examples of what seems to me a relatively novel phenomenon, particularly in the field of drugs and addiction but perhaps generally within popular communication of science, that is, scientific knowledge argued through the framework of the autobiographical genre, given veracity at a rather striking point of crossing between two systems of veridiction, that of autobiography, and that of scientific method.

Method

The analysis conducted here is based on two books: recently published popular science works that combine neuroscientific research on drugs and addiction with extended personal memoir: Marc Lewis's *Memoirs of an Addicted Brain: A Neuroscientist Examines his Former Life on Drugs* (2011), and Carl Hart's *High Price: A Neuroscientist's Journey of Self-discovery that Challenges Everything You Think You Know about Drugs and Society* (2013). These books offer a unique perspective on the public communication of science not because they are popular renditions of science, or because the authors include details about themselves in them. Their main characteristic is that the personal perspectives they include relate to precisely the same issue they present through the science they discuss. In this respect they differ from the works of, say, Oliver Sacks (psychiatry, see for instance, *The Man Who Mistook his Wife for a Hat*, 1985), or Robert Winston (medicine, see for instance, *Human Instinct*, 2002). The analysis also draws briefly on reviews of both books published in major news outlets. The books were analysed by close reading and the creation and application of a coding system which identified and organised key themes. These themes were: evidence, experience, bias, identity and truth. By considering the books' claims and perspectives according to these themes, it became possible to 'sort out' the

contradictory claims each book makes in promoting its particular views of addiction and the scientific endeavour. The reviews were collected as a means of assessing the reception of both books, the success or otherwise of their textual strategies. They were collected by conducting Google keyword searches, and selecting from the results relevant publications to form a corpus of 21 articles. These publications were chosen on the basis that their main purpose was to review one of the two books analysed here, and that they were published in a major publicly accessible news outlet, for example, *The Boston Globe and Mail* (US), *The Age* (Australia), *The Guardian* (UK). These articles were also then analysed according to the themes of evidence, experience, bias, identity and truth identified in the two books. The purpose in conducting this parallel analysis was to track how the approaches adopted in the two books were greeted in the reviews. Were the authors' claims for authority and superior knowledge accepted or challenged in the reviews? Were their epistemological strategies effective? The reviews are treated here both as reflections of public perceptions of scientific authority and knowledge-making practices, and as part of the means by which those public perceptions are shaped.

The neuro-auto-biographical moment

Lewis and Hart's books emerge out of a specific moment in thinking about drug use and addiction. Both take up a relatively new approach to understanding human conduct including drug consumption – that offered by neuroscience – and both are written by working neuroscientists (with the aid, in one case, of a ghost writer). The books are strikingly similar in one additional aspect. As I have noted, they both offer detailed accounts of the authors' early and present-day lives alongside the exegesis of neuroscientific theory and research the books contain. The purpose of combining these materials is not readily summarised, indeed it is in one sense the subject of this investigation (as the following analysis will show). The bringing together of scientific exegesis and personal narrative in these two books is on the one hand rather banal and predictable: as many commentators have already noted, contemporary life has moved noticeably towards the public exploration of intimate personal lives and confessional modes of public discourse in almost any context (Tanner, Maher and Fraser, 2013). On the other hand, the turn to autobiography here is actually rather extraordinary. Two scientists committed to orthodox accounts of scientific objectivity

and method, Lewis and Hart nevertheless actively mix tales of their own personal experiences with conventionally produced scientific research data, using these experiences to ratify or reject these data. As we will see, the contradictions this textual strategy introduces rapidly become clear. This is not to say either source of knowledge has in itself more validity than the other. The tensions arise only when the two are confused, or one is elided by the other. In this respect my analysis aims to do as Latour also intends:

... to clarify...category mistakes bearing on what I have called the various modes of existence. (Latour, 2013, p. 17)

As he explains of this interest in 'category mistakes',

By comparing conflicts of values in pairs—scientific versus religious, for example, or legal versus political, or scientific versus fictional [in the case of this article, scientific versus autobiographical], and so on—we shall observe very quickly that a large proportion of the tensions...stem from the fact that the veracity of one mode is judged in terms of the conditions of veridiction of a different mode. (Latour, 2013, pp. 17-18)

There are many different ways of analysing works of autobiography that also aim to act as works of scientific reporting. Here I focus on a fundamental theme of these works: the making of knowledge. I do so for three reasons. Firstly, the stridency with which formal scientific method aims to exclude the personal or subjective from its epistemological territory (Shapin, 2012) means an obvious tension exists in these works. Second, the topic area the books cover, that of drug use and addiction, is highly controversial – like climate change, it is an area inspiring fierce disagreement accompanied by intense criticism of the epistemological processes by which knowledge about it is produced. The third reason is related to this: neuroscience too is controversial. This controversy did not begin with the by now well-publicised test that found brain imaging techniques are as likely to record neural activity in a dead salmon as in a living human being (Bennett et al., 2010), but the coverage of this telling experiment effectively articulated and proliferated it. Given the controversy surrounding addiction and neuroscience, Lewis and Hart's decisions to combine scientific research with personal impressions and anecdote would seem somewhat puzzling. If more clarity is needed on these issues, more reliable information free of hyperbole, political investments and mobilisations

of unexamined affective discourse, how will the recounting of personal dramas help? The answer to this question is a complicated one because it resides in the multiple spaces of what we might call the 'empirical'. In the sections that follow, I draw out the different ways each book explicitly and implicitly engages notions of the empirical in the process of justifying their (strikingly different) perspectives and elaborating their particular conclusions about drugs and the brain.

Lewis: 'My own life as a springboard'

Published in 2011, Marc Lewis's book sets out to use neuroscientific accounts of human conduct and experience to explain what drugs do and why addiction arises. He does this by recounting his own life and drug-related experiences, turning regularly to neuroscience throughout his first-person narrative to apply its concepts and terminology to the pictures he creates. The introduction begins (2011, p. 1) with a clear statement of the role of the brain in 'addiction', and the place of his experience in illustrating and affirming this role:

This book shows how the fundamental workings of the brain are at the root of the problem, but from a unique vantage point. I use the events of my own life as a springboard to the addicted brain.

Thus Lewis begins by establishing his credentials explicitly through the 'crossing' phenomenon Latour identifies in his book. In Lewis's case, the crossing in operation is that between science and autobiography. Just as the climate scientist Latour observed responded to science's inability to resolve controversy by invoking the 'institution' to back up his claims, Lewis invokes subjective experience (often expressed as identity politics) to the same ends. As he puts it, in a formulation that takes for granted, even as it aims to overcome, the foundation of scientific method as objective and impersonal:

I'm an expert on the matter from inside out and outside in, because I'm a drug addict turned neuroscientist. (Lewis, 2011, p. 1)

The construction of inside and outside here is in some respects quite compelling. Its common sense appeal lies in its turn to the perspectives of those studied by science to augment science's insights. As such it can be traced in part back to the rise of the consumer health movement and its critique of science in general and medicine in particular as unwilling and unable to listen to those it

purports to wish to help (Fraser, Roberts and valentine, 2009). Over the page Lewis goes on to say of the neuroscience of addiction that it:

ignores the actual experiences that turn real people, motivated by hope as much as hedonism, resolve as much as indulgence, back into addicts, again and again. (Lewis, 2011, p. 2)

Here (and, as we shall see, in Hart's book too), neuroscience is presented both as the primary source of reliable unbiased knowledge about addiction – knowledge produced from the neutral 'outside' – and also as incomplete because it is not able to draw on subjective experience.

Lewis's observation is striking for several reasons. First, it indicates his commitment to the idea of scientific objectivity in that he presents scientific knowledge as external to the subjective – as outside personal or subjective experience. Second, it raises questions about his aims in that it asserts the need to incorporate the subjective into science without asking how this might happen given science's main aim and its main claim to authority is to eradicate the subjective. Indeed elsewhere the book treats scientific knowledge as complete and reliable, continually turning to research on the brain to explain the author's personal experiences with drugs. Third, in positing autobiography as a necessary addition to neuroscience, it exposes a significant gap in his knowledge of or interest in the broader field of addiction research, one that will not be unfamiliar to social scientists, especially qualitative researchers, working in this area of investigation, in that it ignores the extensive existing social science literature on addiction that has, for decades, investigated and elucidated subjective experiences of addiction. In other words, presenting autobiography as the primary or only alternative to the rather abstract insights offered by neuroscience has very important effects. By erasing a vast body of research that provides a far more comprehensive set of perspectives on the subjective experiences of addiction than can be offered by one neuroscientist's personal journey, it tends to reaffirm science's preeminent place in knowledge-making. So when Lewis echoes interpretations of drug use familiar from social science and psychology, they are presented as insights gleaned from his own personal journey:

These are some of the insights that occur to me when examining the addicted brain... The drug (or other substance) stands for a cluster of needs: in my case, needs for warmth, safety, freedom, and self-sufficiency. (Lewis, 2011 p. 305)

The key issue here for the purposes of this article is that in ignoring the social sciences, the book contradicts its aim of augmenting or challenging the neuroscience. Rather than turning to the findings of other disciplines, it draws on yet more data supplied by a neuroscientist.

Lewis's comment is striking for a third reason too: it opens up an important epistemological tension in his project. What is the status of this personal experience? How and to what extent can it be used to augment scientific knowledge given how partial it is, how thoroughly shaped by the specific interests and desires of the person who is both the source and the arbiter of that knowledge? As the extract above indicates, Lewis does not hesitate to extrapolate from his own experience. In short, science, it could be argued, was invented precisely to overcome or replace knowledge of the kind Lewis wishes to apply to questions of addiction – subjective knowledge motivated by individual concerns and needs, knowledge that cannot identify its own limits. How are the contradictions evident in the 'crossing' here between valuing scientific objectivity and valuing individual subjectivity (two sets of conditions of veridiction) to be resolved? This issue remains latent in the text. And of course, there is another important effect of Lewis's move to incorporate personal memoir with scientific data. That is the promulgation of the popular myth that traditional science is not already subjective or personal, that other scientists are never drug addicts, that science takes no position from the inside, that it is what it sets out to be: entirely untouched by the local, specific and interested viewpoints and concerns of individuals. By taking science to be separate from the personal, and suggesting that mixing memoir with science can remedy this, Lewis's account paradoxically reinforces the idea of science's objectivity, and thus its authority.

Lewis's mix of memoir and neuroscience entails another important dynamic as well. Behind the book's idea of the power of the personal is an even more significant conceptual force, that of identity politics. As with Latour's story about the climate scientist, Lewis's book, I would argue, exposes an important development in the social status of science: an anxiety among scientists that their stock in trade has lost its authority and influence, and must be lent force by invoking the authority of one of its apparent nemeses: identity politics. As Lewis assures us at the book's outset, despite his move into the privileged world of academic science, he 'will always be one of those kids' (p. 3), that is, a troubled young person vulnerable to the appeal and rewards of drug use. In other words, even as he comes to occupy a privileged place as a recognised scientist far from the

trauma and drama of his young days, Lewis remains an individual with privileged access to the truths of drug addiction, not because of his science but because of his personal experiences. Presumably it is this privileged place that allows Lewis to say so harshly and sweepingly of those he calls 'addicts' that they 'lose the mental muscle tone for self-direction, for resolve, for strength of character, and for decency itself.' (Lewis, 2011, p. 247). The place of identity politics in scientific debate will be revisited in the later discussion of Carl Hart's book. For now it is enough to note that, rather like Latour's climate scientist, Lewis is at pains in his book to form an epistemological 'crossing', one that will, we infer, make up for science's inability to convince us of the truth of its claims in its own right.

Lewis's attempt to lend neuroscience additional relevance and credibility is especially notable given the book is also obliged to acknowledge neuroscience's limits and failings. As becomes obvious at the end of the book, the question of what should be done about addiction turns out to be rather too hard for this approach. The autobiographical thread of the story comes to rest at the moment in which Lewis finally discovers, after more than a decade as an 'addict', a way to say 'no' to drugs. How does he do this? Or more properly given his neuroscientific framing, how does his brain do this? He doesn't know. This moment, which we are told largely sustains him on a drug-free course to the present day, proves inexplicable in the terms he depends upon in the book. As he puts it:

It shocked me that, after all these years of addiction, the craving should drop off so rapidly. I no longer had to apply pressure to the wound. It had stopped bleeding...How could so much neural commitment have broken down so quickly? How could my addled, addicted brain still be that resilient? ... I don't actually know the answer. I believe that further research...will help me get closer to finding it. (Lewis, 2011, p. 297)

The fate of Lewis's narrative is important for many reasons, not least because it must lead the reader to wonder about the purpose of the neuroscientific material that precedes this moment in the book, material that promises, it is implied, to offer a reliable and comprehensive explanatory approach to a tragic, otherwise intractable problem. In these promises, in their abrupt and unapologetic abandonment at the book's conclusion, and in Lewis's final, rather familiar, appeal to a scientific future which will some day furnish what is not yet known (Fraser and Seear, 2011), we

begin to recognise the outlines of Latour's concerns about science and the moderns and his call for a more modest and diplomatic epistemology. Although Lewis criticises science for delivering an incomplete picture of addiction, and offers his own personal experiences as an additional source of insight and authority on the issue, he remains a loyal adherent of scientific knowledge in the modern vein, even as he is forced, at the end of his story, to admit that neuroscience has no capacity to illuminate what even his own experience constructs as the most important question about addiction – how to overcome it.

How effective are these efforts to shore up scientific influence by appeals to identity politics? Media reviews of Lewis's books suggest mixed results (Ahmed, 2012; Brown, 2012; Capp, 2012; Dayton, 2012; Matyja, 2011; Liu, 2012; Narth, 2011; Peitzman, 2012; Phelan, 2013; Rommelmann, 2012; Satel, 2012; Shariatmadari, 2012; Warner, 2011). Many make much of his dual credentials as neuroscientist and former 'addict'. Liu (2012) reads Lewis's mixture of science and autobiography to be telling us that 'the triumph of brain science, it seems, means acknowledging the addict in us all'. While the presentation of neuroscience via the ratifying discourse of personal experience appears to persuade many readers, the account does not wash for every aspect of Lewis's story. Satel (2012) attempts to draw lessons from his 'life and brain', pointing to various principles the story demonstrates, such as the ability of the 'drug-addled brain' to 'repair itself'. At the same time, she criticises the book's reductive treatment of Lewis's eventual turn away from drugs. Shariatmadari (2012) finds the book both 'fascinating and irritating', turning an especially sceptical eye on Lewis's neuroscientific explanation of his violence against his partner. Ultimately he is unconvinced: 'For all its scientific dazzle, [the book] is no more complete a portrait of real life'.

The question of how persuasive the neuroscientific/autobiographical crossing is for readers is equally, if not more, salient for the second book I examine, Carl Hart's *High Price*. An African American professor of neuroscience who grew up in the Miami ghetto and served in the US airforce, Hart lays claim to some formidable identity-related authority on drugs and addiction. And his arguments about these issues are very different from Lewis's.

Hart: 'to learn by example'

Published in 2013, *High Price* has generated an enormous amount of media coverage, rather more than Lewis's book. With appearances on Fox News, CNN and other major news outlets, and reviews in key US and overseas newspapers, Hart and his book have attracted a great deal of attention. Billed as an unprecedented intervention in the debate about the US's 'war on drugs', the book brings together neuroscientific accounts of drug use and addiction with personal memoir and some reference to psychology and the social science of drug use to argue that much of what is taken for granted about drugs in the US is not reliable – instead it is deeply enmeshed in that country's racial politics.

Perhaps the first and most obvious aspect of the book noticeable to a social science researcher, however, is that the ideas to which the book draws attention have been in circulation for many years. Despite the rather hyperbolic tone of many of the very positive notices the book has received, which emphasise the book's capacity to revolutionise thinking, Hart does not make a new argument. Instead he draws on a longstanding line of research that sees drug effects as culturally specific and dependent upon context, making his argument via an unorthodox mix of genres (popular science, autobiography and some social science) and authorising these arguments through powerful identity claims and the notion of personal 'experience'. In this respect the book is very like Lewis's, indeed it is tempting to conclude the book was written as a response. Read together, the books emerge as almost diametrically opposed in many aspects of their approaches to addiction, as engaged in an implicit battle on the terrain of identity politics in which these opposing views are lent weight through the personal stories of their authors.

How exactly do the books' approaches differ? The main point of divergence can be found in the contrasting treatment of addiction itself. Lewis uses neuroscience to paint a conventional picture of drugs as having predictable effects, and addiction as a profoundly enslaving long-term affliction resulting from drug use. While he does not explicitly set out to persuade the reader to see drug use as necessarily leading to addiction, his generalisations about what happens in the brain on consuming drugs and his depiction of himself as a lonely youth not very different from other youths implies that the addiction he experienced could befall any consumer of drugs. Hart takes a different view, one familiar among social scientists of drug use, that addiction is actually a rare consequence of drug use, that most drug use is unproblematic, and where difficulties familiar from

conventional notions of addiction do appear, these are most often really the effects of intersecting burdens of structural disadvantages such as poverty and racism. Like Lewis, Hart uses neuroscience to explain the effects of drugs and the physiology of addiction, but he also points out that, for many reasons, neuroscience has oversimplified drug use and addiction. This is really the substance of his book: the claim that scientists of drug use and addiction have allowed themselves to be blinded by convention, legal discourse, racism and self-interest to produce flawed research and interpret good research in flawed ways. The book is in many respects a courageous attempt to expose the weakness of the science of addiction and the role of racism in the constitution of the idea, and in the process it takes aim at many different elements in the US's hyperbolic treatment of drug use, and the inequitable effects of this treatment. The book makes an attempt to draw on the critical psychology and social science of addiction, citing work well known to social science scholars of addiction, such as the Rat Park experiments of the 1970s (Alexander *et al.*, 1980) and Zinberg's (1984) 'drug, set and setting' approach to drugs. Indeed it is this turn to the existing critical approaches to drug use that highlight most strikingly the special role of this book, and the autobiographical approach that it, like Lewis's, takes. As I have noted, Zinberg and the authors of the Rat Park experiments published their findings more than 30 years ago. Since then, these works have been built upon and exceeded to produce a robust field of critical social science studies of drug use and addiction (for example, (Berridge, 1999; Bourgois, 2000; Fraser and valentine, 2008; Keane, 2009; Levine 1978; Redfield and Brodie, 2002; Reinerman, 2005; Reith, 2004; Room, 1985; 1998; 2001; 2003; Seddon, 2010; Smith, 2011; Summerson Carr, 2011; Valverde, 1998).

Hart, we come to realise rather quickly on reading the book and tracking its impact, achieves something other critics of US drug policy, even those such as Stanton Peele also writing in the popular science space Hart occupies, never really have before: a widespread receptive and respectful hearing of ideas that have long been accepted within the social sciences of drug use but have been ignored by US policy, politicians and physical scientists. How Hart achieves this, and the implications of his approach for the internal coherence of the book, are the next focus of this article. As we will see, Hart calls on similar strategies to Lewis's, but does so more successfully in the eyes of his reviewers. Perhaps most importantly for my purposes here, while he does this as a means of arguing a very different case from Lewis's, he ultimately adheres just as strongly to the

idea I consider (and Latour suggests) is most in need of rethinking: scientific objectivity. While reviews of Hart's book (Castillo, 2013; Farris, 2013; Koven, 2013; Kuchment, 2013; McCormack, 2013a; 2013b; Schlichenmeyer, 2013; Seiffert, 2013; Tierney, 2013; Williams, 2013) are stronger than Lewis's, the contradictions its simultaneous adherence to objectivity and autobiography introduces into his case are more marked, precisely because of the arguments he makes. As in Lewis's book, the key issues here are to do with evidence, objectivity and the role of personal experience.

The issues I wish to draw out are highlighted very early in Hart's book. The preface is only two paragraphs old before he states:

I'm frequently asked why I wrote this book...a book that reveals deep personal details about my life...The primary reason I wrote this book was to show the public how the emotional hysteria that stems from misinformation related to illegal drugs obfuscates the real problems faced by marginalised people. (Hart, 2013, p. xi)

It seems to me that this explanation contains within it the crux of the problem of scientific objectivity, a phenomenon to which Hart, Lewis and of course many other scientists devote their work, but which introduces as many problems as it solves. If science's strength is its ability to create objectivity through rigorous method, and this objectivity is the basis for the quality of its knowledge, why is introducing a personal perspective necessary or desirable? What is the place of the 'personal', of the individual perspective and experience, in this scientific method and, connected with this, how should emotion be viewed? Hart, it seems, is torn about this. Like Lewis he introduces material from his own life to illuminate the perspective he wishes to present on drugs and addiction, explicitly using his own perspective on events as the basis for claims about the facts of drug use and the reality of addiction. As he puts it,

To shed light on [the issues]...I use real-life examples, mainly from my own life. I hope this will help the reader to learn by example and then generalise more broadly. (Hart, 2013: xii)

This formulation is, I think, revealing in its lack of precision. What does Hart mean by 'shed light', by 'real-life', by 'learn by example' and by 'generalise more broadly'? Scientific method is no narrow recipe, of course, but it is possible to identify some fundamental claims about method that must be in place for knowledge-making to be considered scientific. Perhaps the most important

ones are the role of observation or the empirical, and the basis on which generalisations might be made. In this explanation for the use of personal story (or ‘anecdote’ if we are to use the term so frequently mobilised by scientists when dismissing personal experience) Hart tells us to treat his own story as the basis for formulating a generalisable view on drugs and addiction. Later, we see, it forms the basis for his own transition from drug-war devotee to drug-war sceptic.

Hart is not altogether unaware of the difficulties his approach presents for a scientific account. He goes on to qualify his statement by adding:

I also recognise that inaccurate conclusions can be easily made if personal anecdotes alone are used [...so I] used scientific knowledge of the human mind, brain and behaviour in an effort to decrease the likelihood of the reader drawing inappropriate conclusions.

(Hart, 2013, p. xii)

This is perhaps the fundamental issue for any discussion of scientific method and the relationship between personal anecdote or perspective, and ‘proper’ scientific evidence. As Hart later explains (2013, p. 15),

I want to explore with you what I’ve learned, especially the importance of empirical evidence – that is, evidence that comes directly from experiments or measurable observations – in understanding issues like drugs and addiction. Importantly, such evidence is reliable and experiments are designed to avoid the bias that can come from looking at one or two cases that might not be typical.

As feminists and many other scholars have now conclusively demonstrated, although scientific method developed as a means of producing knowledge free of assumptions, personal bias and culture-bound misconceptions, this has never been achieved. The dream of scientific objectivity, pursued through strict adherence to certain methodological rules and conventions, is nothing more than an ideal that has served to authorise perspectives that, on critical examination, often operate in the service of power (see Emily Martin’s (1991) article ‘The egg and the sperm’, and Thomas Lacqueur’s (1992) book *Making Sex* for classics in this broad body of work). In short, as critics have shown, scientific method does not deliver the value-free knowledge it promises. Instead science is full of studies, findings and conclusions thoroughly shaped by the subjective perceptions of the scientists involved, their individual and socially situated stories and the ideas and emotions

to which they are subject. This is, of course, one of the problems with posing science as an antidote to 'emotional hysteria'. Scientists have never been able to escape or overcome their emotions, and the suggestion that they can is merely a regulatory myth aimed at gathering to scientists and their pronouncements ultimate authority. In this respect it makes little sense for Hart to say that along with anecdote we need the dispassionate insights of science – and his later criticisms of addiction neuroscientists as led by their preconceptions and personal interests only entrenches this contradiction further. Indeed, when he goes on to say (2013, p. xii) that he wants us to 'think more objectively and critically about the multitude of issues that come along with illegal drug use...' we are necessarily confused. Is objectivity possible? If his own subjective story allows him to improve upon the science, how does this sit with his promotion of objectivity?

The main difficulty Hart faces in his book is that he wishes to challenge the conventional thinking among neuroscientists on drug use, but he wants to do so *both* by drawing on his own subjective experience *and* by preserving science's special status as the producer of reliable objective knowledge free of the taint of the subjective. About science he says:

As citizens in a society where there are many people with varying agendas trying to wrap themselves in the cloak of science, it's important to know how to think critically about information that is presented as scientific because sometimes even the most thoughtful people can be duped. (Hart, 2013, p. 15)

Here Hart mobilises the idea of pseudoscience, saying that the language and authority of science is sometimes wrongly appropriated by those with a particular ideological purpose. The trouble with this formulation of the problem of the neuroscience of addiction is that Hart later makes clear that this problem is not confined to the fringes of addiction science. Indeed, in the book's conclusion he describes a high-powered scientific roundtable on methamphetamine with key scientists and the US's National Institute on Drug Abuse (NIDA), the world's most powerful proponents of the neuroscientific or 'brain disease' approach to addiction, saying (2013, p. 291) that prior to the meeting he expected that 'the evidence from science would inform our view on the drug. Instead, the roundtable [was]...an exchange in hysteria and ignorance.' Why was this the case? It is hard to see the reasons he puts forward as anything but damning for the ideal of scientific objectivity: NIDA was offering new funding for research on what it framed as the growing scourge of

methamphetamine use. This was, Hart felt, no different from a much earlier government push to research drug use – crack cocaine in the late 1980s and early 1990s – where political interest and new funding had given ‘researchers [...] a stake in the crack hysteria game.’ (2013, p. 292). As he explains a few pages later, an important effect of this new push from NIDA to investigate methamphetamine was that,

Scientists wrote grant applications that treated meth brain damage as a foregone conclusion because they understood quite well the mission of their proposed funder [NIDA] (2013, p. 305).

It is not necessary to accept wholeheartedly Hart’s very instrumentalist interpretation of the reasons behind the scientific community’s approach to drug use, or to believe that such actions where they did occur were cynically motivated, to see that if these forces do operate at one level or another, his ultimate defence of science, and his call to allow the *real* science to shape our understanding, is on thin ground. All science relies on funding imperatives, institutional forces and individual careers. All science is located in specific historical, political and social conditions.

Perhaps it is the empirical itself that Hart ultimately believes in and wishes to preserve? As he puts it, empirical evidence is crucial to understanding the world. What does he mean by this term, empirical? It is evidence that ‘comes directly from experiments or measurable observations, and as such, is reliable’ (2013, p.15). He argues that ‘many people rely on personal anecdotes about drug experience...as if they are representative cases or scientific data. They are not.’ At the same time, he goes on later in the book (2013, p. 211) to spell out that his own view of drug use changed radically when he stopped accepting scientific research findings and looked back at his own personal experience:

I’d had the experience of most drug users, the not particularly exciting non-addiction story that never gets told...Indeed, when I began researching drugs myself as a scientist, I first discounted my own personal experiences as being aberrant.

Here Hart explains that reviewing his own personal experience discredited existing scientific knowledge for him, and his own research agenda changed significantly as a result. Again, however, Hart’s view is confusing. Earlier he says of the conventional negative outlook on drug use (2013, p.19), ‘Before I became a scientist, I bought right in.’ This suggests that he believes

becoming a scientist enabled a clearer, more accurate view on drugs. Yet, as he himself argues, many scientists *continue* to ‘buy right in’, so being a scientist is clearly not enough to produce the clarity he found. And of course, as we have just seen, it isn’t science that changes his view of drug use, rather it is his recollection of his own personal experiences and the observation of the gap between that experience and the assumptions made by scientists in their research.

Ultimately, within this confusion lies what seems to be a fundamental desire on Hart’s part to preserve the value of scientific objectivity, no matter how impossible it is to achieve and how important subjective experience turns out to be for understanding the subject of his research. Hart is critical of and angry with scientists, but he does not wish to challenge science altogether. Instead throughout the book he proposes various ways of viewing the problems with the scientific research that preserve the authority of scientific objectivity. One is to suggest that individual scientists confuse the oversimplifications necessary for artificial experimental conditions with real life:

While science must reduce complexity in order to conduct studies, the interpretation of that data cannot simply be extrapolated back without recognising these and other relevant caveats. [NP] As a neuroscientist, however, I didn’t recognise this at first and I think many of my colleagues still have difficulty doing so. (Hart, 2013, pp. 74-5)

Another, posited much later in the book, is to blame the media’s *reporting* of scientific research, rather than the research itself:

Much of what we learn as scientists involves critically interrogating the methodology used to conduct research and trying to root out as many sources of bias as we can. The media, however, does not apply these methods to its reporting. (Hart, 2013, pp. 243-4)

Of course, Hart has already made clear that scientists do not always apply these rigorous standards. Indeed, later he describes his field of research in terms that suggest it is thoroughly biased: ‘Everyone around me in the addiction field acted as though pathological use was more common than controlled use.’ (Hart, 2013, p. 262)

Within this confusion over whether science can save us from the prejudice against drug use and the racism Hart sees as wrapped up in this prejudice lies a fundamental question for the nature of scientific inquiry itself – the question Latour raises in his work on modes of existence: is

Enlightenment modernity's quest for value-free objective knowledge either viable or desirable?

Marc Lewis's book shows us that it is possible to quarantine one's own experience (even as this personal experience is explored as a source of illumination) to such an extent that an explanatory framework completely unable to account for it (here neuroscience) continues to be promoted as the answer. Hart's book is more complicated than this. It presents a number of challenges to the Enlightenment ideal of objective, value-free knowledge: first, that individual experience can be more reliable than formally produced scientific knowledge, second, that scientific knowledge is thoroughly enmeshed in subjective interests such as national politics and funding imperatives, and, third, to add a new point, that research can actually be improved by the creation of close connections between researcher and research subjects:

I liked getting to know the participants. It not only helped the experiments run more smoothly, but also gave me insight into their world, which allows me to do better science.

(Hart, 2013, p. 275)

In all these ways Hart seems to suggest that scientific method narrowly conceived is not the essential foundation for creating good knowledge. Instead it is as open to social, political and economic forces as other epistemologies. Yet, despite these criticisms, and despite his very visible mobilisation of an alternative mode of knowing (autobiography), Hart, like Lewis, remains wedded to scientific method as the proper way to make knowledge about drugs.

How is Hart's strategic combination of autobiography and neuroscience received by reviewers? Overall the reviews are consistently more positive than those for Lewis's book. His explicitly critical relationship to science puts him in a more obviously contradictory relation to the neuroscientific evidence than Lewis, but this problem is comprehensively ignored by reviewers. Many, such as Farris (2013), make much of his origins and the special perspective they give him: 'Hart's experience adds credibility to this important work on substance abuse' (see also, for example, Tierney, 2013; Castillo, 2013). One reviewer, Koven (2013) criticises the book in terms a little like readers of Lewis, arguing that the two components, the neuroscience and the autobiography make it read 'like two different books that have been forced together'. In this criticism is a hint at the epistemological discomfiture I have argued these books entail, but as with

Lewis's reviewers, this issue remains unrecognised and unexplored, and the benefits of bringing it to public awareness unrealised.

At this point it is useful to return to the opening sections of this article, in which I discussed Bruno Latour's recent work on modes of existence, and the anecdote with which he opens his 2013 book. As you will recall, Latour observes a climate scientist's turn to the discourse of scientific institutions to lend credibility to the scientific account of global warming. Latour observes that the challenge that prompted this defence, and the direction it takes, exemplify a distinctly contemporary problem: the loss of faith in science in a context in which the modernity that science instantiates has begun to break down as a credible account of the present and the future. The analysis I have conducted here, of two autobiographical works that promote another body of knowledge that typifies scientific modernity, neuroscience, constitutes, I argue, a parallel case. Like climate change, drug use attracts research and commentary of strikingly diverse complexions: it is a classic 'matter of concern' (see Fraser, 2011 for an application of this concept to the drugs field). Like climate change, it refuses resolution by recourse to the scientific 'evidence'. Of course it is important to note again here that the reasons for these refusals differ significantly in the two cases. Scientific knowledge is questioned and challenged in the case of climate change by those keen to preserve the status quo: vested interests in energy production, mineral resources, agriculture and so on. In the case of drug use, the reverse is the case. The scientific knowledge (neuroscience) is questioned by those wishing to *overhaul* the status quo: drug users themselves, critics of the War on Drugs who do not believe NIDA's claim that the disease model will free drug users of stigma, and researchers such as Hart whose access to alternative perspectives on drugs casts scientific certainties in a different light. The common thread I wish to draw across the two cases is not their political investments but rather their epistemological investments, and the need revealed in both (and raised in Latour's work) for a better way of understanding science and the relations between different modes of knowing (such as neuroscience and autobiography or personal experience) so that public debate can proceed with more 'politeness' (2004) – that is, respect for different knowledges – and faith in the knowledges on which it is based. As Hart himself explains (as though he too has been reading Latour's comments about climate science) improving scientific knowledge and the claims it makes about itself, other knowledges and the world may be necessary if it is to

make a useful contribution to public understandings and to action where it is genuinely needed, such as in the provision of advice about safer drug use.

I worried that we would lose credibility with young people, and that as a result they would reject other drug-related information from 'official' sources even when the information was accurate. (Hart, 2013 p. 307)

Conclusion

At the outset of this article I cited Bruno Latour's anecdote about climate science as a starting point for exploring his observations about the nature of scientific enquiry, modernism and the need to reconsider the claims 'we moderns' make about scientific method, objectivity and the 'veridiction' of knowledge. I then drew a parallel between the crisis of confidence he identifies in the context of climate science with another area, drug use and addiction. I asked how we are to understand the mix of 'scientific fact' and individual self-observation in two recent autobiographical books on the neuroscience of addiction, what this mix might suggest about all scientific knowledge, and what its implications might be for dominant notions of 'evidence-based' drug policy and treatment. It seems to me that the emergence of these autobiographies of science in the field of addiction hint at a critical moment, but not one to which either Lewis or Hart intend to draw our attention. While Lewis is preoccupied with the need to understand addiction neuroscientifically, and with the field's promise to illuminate recovery from addiction, Hart's preoccupation is the racist bias shaping the neuroscience of addiction and the field's collaboration with drug-war politics. While I have a great deal of sympathy in particular with Hart's project, both books seem to miss the point if progress is their aim. That is, both fail to confront the core issue their accounts, indeed even their fundamental decision to present their accounts through autobiography, lay bare: the limits of modern scientific knowledge-making and veridiction, and the urgent need to rethink what science can claim for itself if our knowledge making is to become more effective (Lewis) and equitable (Hart). As Salmon and Charbonnier put it, paraphrasing Latour, 'we have become "other" to ourselves by describing ourselves through a system of categories disconnected from our actual practices.' Lewis and Hart's failure to consider more explicitly this othering and its causes is a real loss, especially in Hart's case where the materials for a deeper critique are most obviously available.

More specifically, both works seem to offer themselves as important correctives to the increasingly strident, apparently countervailing tendency (although perhaps it's one that only supports my case) to call for 'evidence' based policy on drugs. The corrective to which I am referring could work at two levels. First, and most obviously, both books draw attention quite explicitly to the limits of knowledge in what is becoming the flagship field of research on addiction. Second, in performing a 'crossing' between scientific method and autobiography, they show, both by what they say about other researchers and stakeholders and by their own blind spots and contradictions, precisely why the modern account of scientific knowledge must be reconsidered and more modest and diplomatic claims about its role and capacities must be formulated. Here I mean that both books expose the need to see scientific method in a new light, yet neither scientist seems able to grasp this. Instead, while both authors wish to promote good science and the use of scientific evidence in responding to drug use, their chosen autobiographical approach and its underlying appeal to identity politics tends instead to throw scientific method into question, along with the empirical 'evidence' it generates and authorises. Thus the books tie themselves in epistemological knots, behaving in some of the 'thousand contradictory ways' Latour says are the moderns' lot.

Viewed in the more modest terms these books and their limitations suggest are needed, 'evidence' would necessarily change in meaning. Better recognition of the very specific and interested nature of the production of any particular body of scientific evidence, and the ineradicable role of subjective experience and identity politics such as Lewis's and Hart's, would emerge. In turn, this would allow a more active and politically discerning process of assessing what evidence should be produced and how. Certainly this is what both books imply in their concurrent mobilisation of very personal stories alongside scientific research. In such a context, evaluating the underlying desires, implications and ethics at work in, say, the goal of explaining 'addiction' via brain chemistry, would form a primary task for those considering such a goal.

How would addiction emerge from these rather more wide-ranging epistemological and ontological navigations? According to Salmon and Charbonnier (2014, p. 573), the aim of Latour's approach is to 'exorcise' the moderns' obsession with distinction as knowledge-makers, to 'push Western theory out of the driving seat it has occupied in the mutual translation of collective

experience'. Latour's approach, and its overall emphasis on building polite and diplomatic relations between different modes of knowing and veridiction, would suggest a much closer ('ecological'?) engagement than has existed to date between the various stakeholders in the production of knowledge, most obviously for example, between neuroscientists who see labelling addiction a brain disease as useful and compassionate, and drug user advocates, many of whom are at best ambivalent about the disease model in any form. This kind of ecological engagement could, of course, transform scientific practice in all areas, and also reshape public understandings of science and the expectations to which we might hold science. Certainly, as Hart and Lewis's mixing of science and autobiography shows (both intentionally and otherwise), the gap that supposedly exists between scientific rigour and subjective experience is and always has been a false one, its continued promulgation a key part of the changing place of science to which we, Latour, and Lewis and Hart in their different ways, must all attend.

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