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**Virtual Criminology: Insights from genetic-social science and Heidegger**

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**ABSTRACT**

It is the intention here to 'apply' certain meta-concepts from Owen's [2014] *Genetic-Social* framework together with some 'new' constructs, to the study of virtual and hybrid cyber-criminologies associated with Sheila Brown [2006, 2013]. It is strongly suggested that far from playing down or ignoring 'the merging of the human and the technical through sociotechnical environments such as the dissolution of the body into information, disembodied entities, digitalizing the human, simulated consciousness and cybernetics' [Brown, 2013:488], critics are correct to view this 'new' school of criminological theorising as 'old wine in new bottles' [Brown, *ibid*].

It is argued here that Brown's virtual/hybrid criminologies revolve around an under-theorised and reified concept of agency. Drawing upon the model of agency favoured in the *Genetic-Social* framework in which an actor is conceived as an entity capable of formulating and acting upon decisions, and incorporating selected insights from neuroscience which suggest that we need to reformulate the concept of agency as neuro-agency, in tandem with considering the 'hybrid' in terms of Heidegger's *Dasein*, it is suggested that virtual and hybrid criminologies, in common with the related actor-network theories [Callon and Latour, 1981] and posthuman agency theories [Pickering, 1993, 1995a, 1995b, 2001] should be repudiated. It is contended here that we need a non-reified concept of agency which reflects the influence of neurons, and the mutuality between genes and environment, together with the concept from Heidegger [2010] that being is time. The so-called 'merged' human-technical hybrid in reality is an example of symbolic thinking. No machinery or cyborg has the capability of formulating and acting upon decisions without human programming, and no cyborg qualifies as *Dasein*. As Heidegger [*ibid*] suggests, to be is to exist temporally in the stretch between birth and death. In reality there is no 'merging' of the human and the technical. We also consider the implications for social policy inherent in Brown's [2013: 488] contention that it is increasingly difficult to distinguish 'human agency and culpability' from 'non-human objects and technology'.

## Introduction

In what follows, we briefly consider what is meant by virtual and hybrid cyber-criminologies [Brown,], and then move on to codify the new version of Owen's [2014] *Genetic-Social* framework, which incorporates several new meta-concepts since the publication of *Criminological Theory: A Genetic-Social Approach* by Palgrave Macmillan in April 2014. We then 'apply' some of the meta-concepts, which now incorporate insights from neuroscience [Dennett, 1981; Dennett et al, 2007; Moll et al, 2005 ] and the philosophy of Heidegger [2010] to the study of these relatively new forms of criminological theorising pertaining to cyber-crime. In the course of examining virtual and hybrid criminologies we also look at the closely related actor-network theories of Callon and Latour [1981] and theories of posthuman agency associated with Pickering [1993, 1995a, 1995b, 2001]. It is contended that virtual and hybrid cyber-criminologies in addition to their more sociological counterpart, actor-network theory, should be rejected in favour of concepts of neuro-agency and psychobiography. The former meta-concept reflects the idea that when considering 'Who is in charge?', one should keep firmly in mind that human beings [*Dasein*] are the product of natural selection, a cocktail of the mutuality between genes and environment, and we must acknowledge the neuroscience of free-will [agency] and the evolved nature of moral reasoning. The latter meta-concept, psychobiography refers to the asocial, inherited aspects of the person or disposition. Machinery and cyber-technology may simulate a 'merging' between the human and the technical, but in the harsh light of a Heideggerian theory of pure surface, no cyborg or machine can ever qualify as *Dasein*. As Heidegger [2010] made clear, the human being is not an isolated subject removed from the realm of objects but that does not mean that we can 'merge' with the non-human, as Brown [2006, 2013] appears to suggest. For Heidegger, being *is* time, to be a human being is to exist temporally between birth and death. No cyborg or machine can function without being programmed by human neuro-agency, and no cyborg or machine has the cognition to formulate and act upon decisions. It is the human being [*Dasein*] that can do so, and only the human being has a self, capable of being what it is through confronting the reality of death. No cyborg has the capacity to grasp this finitude and 'become who one is'.

## Genetic-Social Framework

In what follows, an updated version of the Genetic-Social, meta-theoretical framework employed by Owen [2014] is codified. The post-Postmodern, ontologically-flexible framework is an example of meta-theory. Metatheorists are largely concerned with ontological questions, and meta-theories and meta-concepts are designed to equip us with a general sense of the kind of things that exist in the world, and with ways of thinking about the question of how we might 'know' that world. The framework relies upon methodological generalisations as opposed to substantive generalisations, and multifactorial analysis, 'preparing the ground' for further theoretical and empirical investigation drawing upon large-scale synthesis. The framework developed out of Sibeon's [2004] anti-reductionist ideas to incorporate ten 'new' meta-concepts and an important focus on the biological variable in analysis which was previously neglected by Sibeon. To date, the framework has been 'applied' as a conceptual toolkit to the study of crime and criminal behaviour, the criminal justice system, human biotechnology, the Human Genome Project, notions of trust and professional power, ageing and masculinities. Its most recent application is in Owen's [ibid] *Criminological Theory: A Genetic-Social Approach*, published by Palgrave Macmillan on 23<sup>rd</sup> April 2014.

As is made clear in the work of Owen [2014], the framework is a contribution towards the post-postmodern return to sociological theory and method in tandem with a cautious attempt to 'build bridges' between criminological theory and selected insights from evolutionary psychology and behavioural genetics, and in its present incarnation at the time of writing, this focus has been expanded to include selected insights from the neuroscience of free-will. In the previous volume, the framework serves as the suggestion as to, 'a way in which criminological theory might move beyond its four main theoretical obstacles' [Owen, 2014: 1]. These obstacles are 'the nihilistic relativism of the postmodern and poststructuralist cultural turn; the oversocialised gaze and harshly environmentalist conceptions of the person; genetic fatalism or the equation of genetic predisposition with inevitability [Owen, 2009, 2012] and biophobia [Freese et al., 2003] that appear to dominate mainstream criminology; and the sociological weaknesses of many so-called biosocial explanations of crime and criminal behaviour [see, for instance,

Walsh and Beaver, 2009; Walsh and Ellis, 2003], which, although dealing adequately with biological variables, appear to neglect or make insufficient use of meta-concepts such as agency-structure, micro-macro and time-space in their accounts of the person'. To reiterate, it is suggested that the way forward lies in the form of an ontologically-flexible, metatheoretical sensitising device, alternatively referred to as *post-postmodern* or *genetic-social* in order to distance the framework from hardline socio-biology.

The starting point is to modify Sibeon's [2004] original *anti-reductionist* framework to include a new focus upon the biological variable [the evidence from evolutionary psychology and behavioural genetics for a partial genetic basis for human behaviour in relation to sexuality, language, reactions to stress, etc.], genetic fatalism, the oversocialised gaze and psychobiography [unique, asocial aspects of the person such as disposition]. Here, the evidence that genes play a role alongside environment in terms of causality in relation to human behaviour is considered [Cosmides and Tooby, 1997; Hamer and Copeland, 1999; Pinker, 1994]. The contention here is that there is sufficient evidence to warrant the incorporation of a focus upon the biological variable into the new metatheoretical framework, alongside meta-concepts, notions of dualism- as opposed to a Giddensian duality of structure, and modified notions of Foucauldian power. The latter notion of modified Foucauldian power entails a recognition of the dialectical relationship between agentic and systemic forms of power; and the relational, contingent and emergent dimensions of power; and the concept that *contra* Foucault, power can be stored in *roles*, such as those played by police officers, and in *systems*, the most obvious of which, for criminologists, is the criminal justice system. It is important to keep in mind here the idea of mutuality when focusing upon biological variables in criminological analysis, what we might call the 'feedback loop' which embraces genes and environment, acknowledging the mutuality and plasticity between them. The *Genetic-Social* framework posits that 'nurture' depends upon genes, and genes require 'nurture'. Genes not only predetermine the broad structure of the brain of *Homo Sapiens* but also absorb formative experiences, react to social cues or, as Hamer and Copeland [1999] suggest, can be switched on by free-willed behaviour and environmental stimuli. For example, stress can be caused by the outside world, by impending events, by bereavements and so on. Short-term stressors cause an immediate increase in the production of norepinephrine and epinephrine, hormones responsible for increasing the heartbeat and preparing the human body for 'fight or flight' in emergency situations. Stressors that have a longer duration may activate a pathway that results in a slower but more persistent increase in cortisol. Cortisol can suppress the working of the immune system. Thus, those who have shown symptoms of stress are more likely to catch infections, because an effect of cortisol is to reduce the activity and number of white blood cells or lymphocytes [Becker et al., 1992]. As Martin [1997] shows, cortisol does this by switching on genes, and it only switches on genes in cells that possess cortisol receptors, which have in turn been switched on by environmental stimuli, such as stress caused by bereavement. Cortisol is secreted in the first instance because a series of genes, such as CYP17, get switched on in the adrenal cortex to produce the enzymes necessary for making cortisol. There are important implications here which inform the attempt to construct *Genetic-Social* criminological theory. For example, Filley et al., [2001] have linked elevated levels of norepinephrine with aggressive criminal behaviour. Hostile behaviour can be induced in humans by increasing plasma levels of norepinephrine, whereas agents that block norepinephrine receptor cells can reduce violent behaviour [ibid]. The enzyme monoamine oxidase is involved in the reduction of norepinephrine, and low levels of monoamine oxidase allow norepinephrine levels to increase [Klintberg, 1996].

The approach to criminological theorising advanced here acknowledges that crime may be socially constructed, in the sense that human actors ascribe meaning to the world, but that there is still a socially-constructed reality 'out there', in the sense that environmental conditions are, 'potential triggers of genetic or physiological predispositions towards behaviour that may be labelled criminal' [Owen, 2014: 3]. However, that does not mean that behaviour should be viewed as reflecting an inherited, pre-written script that is beyond individual control. For example, 'reflexive agents possess the agency to choose not to engage in criminal activities where they believe that their actions will harm others and offend ethico-social codes, or where the rewards are outweighed by negative consequences' [Owen, ibid]. Agency, in turn, is 'influenced not only by morality or reason but also by inherited, constitutional variables' [Owen, ibid]. An inherited impulsive disposition may predispose an actor to formulate and act upon potentially criminal decisions. In *Genetic-Social* theorising, the biological variable may be considered as one element within

multifactorial explanations for crime and criminal behaviour alongside a critique of agency-structure, micro-macro, time-space, and so on.

The framework arises out of a critique of the following illicit forms of theoretical reasoning: reification, essentialism, duality of structure, relativism, genetic fatalism and the oversocialised gaze. The framework offers a flexible ontology and relies upon a multi-factorial analysis. It is capable of identifying a way forward beyond the anti-foundational relativism of postmodernism and Foucauldian poststructuralism, aspects of our intellectual life that are complicit in the stagnation of the largely UK-based critical criminology. An approach which sidesteps the 'nature versus nurture' divide which still haunts mainstream criminology and emphasises instead the mutuality between genes and environment is essential if we are to advance upon Shilling's [1993] starting point for a biological sociology and supercede the biologically top-heavy, largely American attempts at biosocial analysis [Herrnstein and Murray, 1994; Mednick et al., 1987; Mednick and Volavka, 1980; Walsh and Beaver, 2009; Walsh and Ellis, 2003; Wilson and Herrnstein, 1985], which appear to lack a sufficiently sophisticated appreciation of sociological theory and method that would make them truly 'biosocial'. These elements combined make a framework that can contribute towards a new direction for criminological theorising as part of a return to sociological theory and method in the age of the human genome. Its methodological generalisations, its lack of 'bio-phobia' and its realist social ontology make it a sensitising device with the potential for future theoretical and explanatory use best expressed in terms of large-scale synthesis. The ontological position favoured here and in the work of Owen [2014] is, to some extent, influenced by Alain Robbe-Grillet's [1963: 24] Heideggerian repudiation of 'words of a visceral, analogical, or incantatory character', which, one reflects, can arguably be encountered in Gramscian accounts of hegemony utilised in criminological theorising. There are definitely links between the *Genetic-Social* approach favoured here and Robbe-Grillet's [ibid] Realist ontology in the Heideggerian sense of a 'theory of pure surface' positioned against the exaggerated emotionalism of some meta-narratives and the symbolic thinking that characterises theories of hegemony favoured by Marxist criminologists such as Hall [1985].

With regard to the 'cardinal sins' of illegitimate theorising, reductionist theories are ones which attempt to reduce the complexities of social life to a single, unifying principle of explanation or analytical prime-mover such as 'the interests of capitalism', 'patriarchy', 'rational choice', 'the risk society', 'Globalization' and so on. An obvious example of reductionist theorising within criminology lies in the Marxist reliance upon explanations involving economic determinism such as those of Box [1983]. Essentialism is regarded here as a form of theorising that in aprioristic fashion presupposes a unity or homogeneity of phenomena. This can include social institutions, or taxonomic collectivities such as 'white men', 'the middle class' and so on. Essentialist reasoning can be encountered in the work of several radical feminist criminologists [Dobash and Dobash, 1992; Hester et al., 1996], in the sense that such theorists do not appear to regard the degree of homogeneity or heterogeneity of social phenomena as an empirical variable for investigation, but rather presuppose on theoretical grounds a necessary unitariness of the phenomena under investigation, in this case patriarchy. Reification is avoided and defined here as the illicit attribution of agency to entities that are not actors or agents. An actor is an entity that, in principle, has the means of formulating, taking and acting upon decisions. Therefore, 'the state', 'society', 'white people' etc are not regarded as actors. Reification can be encountered in McPherson et al's [1999] reified concept of the Metropolitan Police as 'institutionally racist'. Functional teleology is repudiated as an invalid form of analysis involving attempts to explain the causes of social phenomena in terms of their effects, where 'effects' refers to outcomes or consequences viewed as performances of functions. If there is no evidence of intentional planning by actors, 'somewhere, sometime', then it is a teleological fallacy to engage in explanation of the causes of phenomena *in terms of their effects*, for example, the concept of institutional racism drawn upon in the MacPherson Report into the death of Stephen Lawrence in the United Kingdom, and the case of Hall et al's [1978] account of authoritarian populism and the use of the stereotype of 'the black mugger' as a hegemonic device, which fails to provide evidence of intentional planning by agents 'somewhere, sometime'. Relativism, in the sense of a philosophical stance associated with various Postmodernists such as Lyotard [1984] and Poststructuralists such as Foucault [1972, 1980a, 1980b]. Arguably, relativists reject foundationalism from which theories can be generated, and fail to provide acceptable epistemologies and viable theories. The most basic criticism of Foucault's [ibid] relativistic position is that he never applies it to himself, to his own theories and conceptual frameworks.

Foucault is open, that is to say, to the *self-referential objection* which posits that, if all theories are the product of a particular situation, then so too is *that* theory, and it therefore has no universal validity. To put it another way, if truth and falsity do not exist in an absolute sense, then Foucault's thesis about the relativity of all knowledge cannot be 'true' in this sense. In arguing the way he does, Foucault is surely employing the very criteria of truth and validity which he claims are culturally relative. He is, in a sense, employing reason to try to prove the inadequacy of reason; claiming to provide a universally valid and 'true' explanation of why there is no such thing as a universally valid and 'true' explanation. Put simply, the relativistic statement that there can be no general theory is itself a general theory. The approach favoured here attempts to counter the oversocialised gaze-the term refers to harshly 'environmentalist' accounts of the person which are characterised by a strong antipathy towards biological or partly-biological explanations such as Giddens's [1993] denial of human instincts or Gagnon and Simon's [1973] concept of human sexuality as a 'learned script'. Genetic fatalism is avoided as a 'cardinal sin' and refers here to a widespread tendency with social science to *equate genetic determinism with inevitability*. Arguably, it is a mistake to view the genes involved in human behaviour as immutable. Genes can be 'switched on', and external events-or free-willed behaviour- can 'switch on' genes. Emotive aversion is avoided here and the term refers to a tendency, especially prevalent within the left/liberal consensus that dominates UK-based Criminology, towards emotionally-charged, knee-jerk 'yuk reactions' to controversial subjects ranging from the bio-phobia of reactions against attempts to marry genes and environment to issues such as cloning. An attempt is made here to avoid incantatory language, and the framework can be said to be anti-incantatory in the spirit of Alain Robbe-Grillet [1963] and to some extent Heidegger, in the sense of a 'theory of pure surface' and repugnance felt towards visceral, analogical and incantatory language of the sort which often characterises theories of hegemony, the idea of 'the state as crimogenic' found with Marxist forms of Criminology such as left idealist Critical Criminology. Left idealism can be defined as, 'a sociological approach to crime and punishment whose roots lie in Marxist and neo-Marxist theory' [Coleman and Sim, 2013: 250].

In addition to these 'cardinal sins', the sensitizing device focuses upon the following metatheoretical formulations or meta-concepts:

With regard to the meta-concept of agency-structure, the framework utilises a non-reified conception of agency, in which actors or agents are defined as entities that are, in principle, capable of formulating and acting upon decisions. *Structure* refers to the 'social conditions', or the circumstances in which actors operate, including the resources that actors may draw upon. *Structure* then, may refer to discourses, institutions, social practices and individual/social actors. However, the 'new' term **Neuro-Agency** is now favoured over the earlier 'agency'. This is to acknowledge the work of those such as Daniel Dennet [1981] whose Compatibilist/Soft Determinist work strongly supports the notion of the neuroscience of free-will. The framework adopts an adaptionist, Neural Darwinist approach to human agency which posits that morality evolved. Dennett, writing in *Brainstorms* [1981: 295] explains this position very clearly...

'The model of decision-making I am proposing has the following feature: when we are faced with an important decision, a consideration-generator whose output is to some degree undetermined produces a series of considerations, some of which may of course be immediately rejected as irrelevant by the agent [consciously or unconsciously]. Those considerations that are selected by the agent as having a more than negligible bearing on the decision then figure in a reasoning process, and if the agent is in the main reasonable, those considerations ultimately serve as predictors and explicators of the agent's final decision'.

Micro-macro as a meta-concept refers to the differences in the units of and scale of analyses concerned with the investigation of varying extensions of time-space. *Micro* and *Macro* should be viewed as distinct and autonomous levels of social process. Time-space as a meta-concept refers to significant but neglected dimensions of the social, and reflects concerns with temporality and spatiality. Classical social theorists like Durkheim have tended to regard time as 'social time', distinct from a 'natural essence'. However, the question of how differing time-frames, including those associated with the macro-social order and those with the micro-social, interweave is a complex matter that relates to debates pertaining to *dualism* versus *duality*. The framework acknowledges the multiple nature of power. Power exists in more than one form, in particular, there are objective structural [including systemic] forms of power, and agentic power. The latter term refers to the partly systemic and partly relational and potentially

variable capacity of agents to shape events in a preferred direction. This is a modified notion of Foucauldian power, which recognises the dialectical relationship between agentic and systemic forms of power; the relational, contingent and emergent dimensions of power, and the concept that *contra* Foucault [1980a] aspects of power can be 'stored' in positions/roles such as those of a judge or police officer, and as social systems or social networks. As Owen [2012, 2014] suggests, David Garland's [2001] 'crime control' thesis has an over-reliance upon the Foucauldian concept of discourse embodying power. Like Foucault, Garland appears to presume that discourses are themselves social actors in the sense of a 'crime consciousness' diffused through the media. Arguably, discourses are a form of material that need to be manipulated by human social actors. The framework favours dualism rather than notions of duality of structure. Foucault's work, for example, has a tendency to compact agency and structure together instead of treating them as dualisms. This Foucauldian tendency collapses distinctions between the two resulting in what Archer [1995] has called 'central conflation'. From Heidegger [2010], we employ the term, 'intermittent Gewissen', the idea that the call of conscience is intermittent in human beings. Genetic-Social theorising draws upon the biological variable; the evidence from evolutionary psychology and behavioural genetics for an, at least in part, *biological* basis for some human behaviour. For example, sexuality, language acquisition, reactions to stress and so on. Here, we should keep the notion of 'nature via nurture' [Ridley, 1999, 2003] firmly in mind. This refers to the 'feedback loop' which embraces both genes and environment, acknowledging plasticity and mutuality. Genes predetermine the broad structure of the brain of Homo Sapiens, but they also absorb formative experiences and react to social cues. We also employ notions of Psychobiography, originally coined by Layder [1993] to refer to the largely unique, asocial components of an individual's dispositions, behaviour, and self-identity, these being aspects of the individual that are relatively independent of face-to-face interaction and the macro-social sphere. In his foreword to Owen's [2009] *Social Theory and Human Biotechnology*, Layder states that, 'I fully concur with Owen's 'extension' of the implications of the notions of psychobiography to embrace the mutuality and plasticity of the relations between genetic and environmental influences'. Last but not least, we employ the term 'Dasein' from Heidegger [2010], meaning being-there, human being, being human. Heidegger uses 'Dasein' to refer both to the concrete human being and to its [abstract] being human. The term is usually employed in the Genetic-Social framework to refer to an entity, the human being.

As is emphasised in the introduction, the intention here is to apply some selected examples of the previous meta-constructs to the study of virtual and hybrid criminologies, and in particular, the notion that there has been a merging between the human and nonhuman. In what follows, we briefly examine what is meant by 'virtual criminology'.

### **Virtual and Hybrid Criminologies**

As Brown [2013: 486] suggests, a body of work which has attracted the loose label of 'virtual criminology' has emerged since the mid 1990s, and it focuses upon the implications of contemporary 'technocultures' for the ways in which crime, law and control are conceptualised. Brown [ibid] makes clear that although much 'virtual criminology' involves the study of cybercrime and Internet crime, its scope is wide and it has, 'roots in the expansion of cybernetics, studies of cybercommunities, and virtual reality, as well as information theory more generally, social studies of science and technology, and media theory [see for example, Brown, 2003; Capeller, 2001; and Williams, 2000]'.

For Brown [2013: 486], in historical terms, the discipline of criminology has focused on the 'deviant mind and body as the subject and object of control'. It has also often assumed by criminologists that technology is an external appendage, and 'simply a tool whether in criminal endeavour or social control' [ibid]. As Brown suggests, in virtual criminology, 'both of these are contested; technology is not reducible to the social, and vice-versa; rather it places simulation and disembodied realities centre stage' [ibid]. This theoretical stance is influenced by the work of postmodernist and poststructuralist theorists such as Baudrillard, theorists of late modernity such as Anthony Giddens, theorists of risk such as Ulrich Beck, and the media theorist, Marshall McLuhan [Brown, 2003; Capeller, 2001].

Brown [2013: 488] argues that, 'the central question for virtual criminology must be, does it exist? Is there anything 'different' about virtual criminology that couldn't be accommodated by traditional

criminology?'. Brown is critical of the claims of Realist debunkers of these new forms of 'virtual' and 'hybrid' analyses such as Grabosky [2001] because in her view, they 'play down or ignore the merging of the human and the technical'. The question is posed, 'So where does the human end and the machine begin?' [ibid]. For Brown [ibid: 487], what is at stake here is, 'the notion of the *interface* between the human and the software/hardware; the human sensorium extends into virtuality and makes the human being and the machine co-constituents'. The concept of a 'criminology of hybrids' and the so-called 'merging' of the human and non-human has been explored by Brown [2006] in an issue of *Theoretical Criminology*, in which the author draws upon related conceptual 'schools' such as actor-network theory and information theory together with insights from postfeminist analysis. Brown [ibid] appears to believe that the world should be conceptualised as a human/technical hybrid or information net.

In what follows, we apply some of the meta-constructs of the Genetic-Social framework, together with selected insights from Heidegger [2010], to a critique of some of Brown's ideas and the concept of a virtual/hybrid criminology. Here it is also necessary to examine closely-related schools of thought; actor-network theory and posthuman agency theory. Arguably, both of these related theoretical schools also revolve around a reified and illegitimate concept of agency which should be repudiated.

### **Applying Insights From the Genetic-Social Framework and the Work of Heidegger**

Owen [2014: 170] discusses the related schools of actor-network theory and posthumanism, both of which are 'greatly at odds with the non-reified conception of agency' favoured in the Genetic-Social framework. Arguably, we should reject both kinds of accounts. Material and non-human agency which attributes causal powers to physical objects [Pickering, 2001] such as stones must be repudiated. Also to be rejected is Brown's [2013: 488] claim in relation to virtual criminology and cybercrime to the ends that 'in increasing numbers of instances' we are no longer able to distinguish 'human agency, culpability and motivation' from 'technology and non-human objects'. *Contra* Brown, 'the essence of humanity' is 'self-evident'. Put simply, it is the human actor who programmes the computer, and only the human actor who is capable of formulating and acting upon decisions [Owen, 2014: 170]. In Genetic-Social theorising, we draw upon the evolutionary psychology of Tooby and Cosmides [1992] in Barkow et al [1992], which argues for a flexible picture of causality in which genes play a part, but environmental influences and the underlying mechanisms pertaining to psychology play a part also. In a sense, 'nobody is in charge' but, for example, the response to stress in *Homo Sapiens* depends upon natural selection's intricate, interconnected system in which 'nurture' depends upon genes, and genes require nurture in a form of mutuality and plasticity.

It is argued here that Brown's [2003, 2006, 2013] concept of virtual and hybrid criminologies revolves around a reified notion of agency. Reification, the 'cardinal sin' of illegitimately attributing agency to entities which are not actors, as is suggested by Owen [2014: 123] 'can be encountered within the literature of contemporary criminological theorising'. To recap, within the Genetic-Social framework an actor is an entity that in principle 'has the cognitive means of formulating, taking and acting upon decisions [Owen, 2012: 91]. Therefore computers, the state, society, the Metropolitan Police and so on are not regarded as actors. This approach, particularly with regard to conceptualisations of the state as a non-actor, places the framework very much at odds with conceptions favoured within much of left idealism.

Brown's concept of the merged 'hybrid' between human actor and computer appears to revolve around not only a reified concept of agency but also one which fails to acknowledge the influence of the burgeoning literature on the neuroscience of free-will. Authors such as Dennett [1981, Dennett et al [2007] and Moll et al [2005] have clearly demonstrated the role that neurons play in agency and in evolved morality. This is why it is argued here that we need to employ the new term *Neuro-Agency* in order to acknowledge these advances in research into the nature of human free-will.

Brown's concept of the merged hybrid entity can be countered by applying some insights from Heidegger's [2010] *Being and Time*. For Heidegger, the term for a human being is *Dasein*, which essentially translates as 'being there'. For Heidegger, the human being is not an isolated subject removed from the world of objects that it desires knowledge of. Humans are beings who are always *already in the world*, and in the main we do not distinguish ourselves from this world. When considering Brown's concept of the merged human/cyber hybrid, it is important to note that the essential message of *Being and Time* is

that being *is* time. What it means for a human actor to *be* is to exist temporally in the time between birth and death. For Heidegger, the existence of God is a philosophical irrelevance because the self does not 'find itself' through a relationship with a Creator but rather through confrontation with physical death. Brown's concept of the merged hybrid is flawed in the sense that no cyborg is capable of ascribing meaning to its own finitude. If, as Heidegger suggests, our being is finite, then the human being or *Dasein* is defined by this grasping of finitude. For Heidegger, *Dasein* is also defined by the capacity for curiosity and to be puzzled by questions such as why there is 'something' rather than 'nothing'. For Heidegger, *Dasein's* meaning is to exist with a certain past, a personal socio-cultural history in the world and to have available 'ways to be' - a series of possibilities to exercise agency. This 'mineness' cannot be applied to machines. If the very basis of being human is defined by Heidegger's concept of 'mineness', then one's being is surely not a matter of indifference. A computer is unable to function unless programmed by a conscious human actor, and it cannot undergo any experience of self-questioning or self-doubt in the way that human social actors can. This is the essential difference between the human and the machine which is why the concept of a 'merging' is undertheorised and flawed. Heidegger's concept of *Eigentlichkeit* or authenticity can also be used to counter Brown's hybrid concept. For Heidegger there are basically two major forms of being; the authentic and the inauthentic, and one is faced with the choice to be oneself or not to be oneself, to be the 'author' of oneself or not. No computer has this ability, and no computer can be described as a 'who' that is shaped and formed by existence in time, a 'creature with a past', its being accessed by means of an existential analytic, rather than a 'what', like some other material object in space. Mineness or *Jemeinigkeit* revolves around the idea that it is we, the human beings, who are the entities to be analysed.

It is at this point that we need to consider the important matter of *non-agency*. We need to keep this firmly in mind as in what follows, we trace the genealogy of Brown's concept of the merged human/cyber hybrid to the influence of Callon and Latour's [1981] *Actor-Network* theories, and related concepts such as the *Posthumanism* of Pickering [.]. Both of these 'schools' are closely related to Brown's hybrid conception, and both like the latter rely upon a conception of the actor which are greatly at odds with the non-reified conception favoured in the Genetic-Social framework.

### **Actor-Network Theory and Posthumanism**

As Owen [2014: 123] suggests, *Actor-Network theory* and *Posthumanism* both, arguably, attempt to 'redefine the relationship between the social and nature and are regarded as related to sociologies of science'. It is argued here that their reified conceptions of the actor make the work of the schools less useful as conceptual frameworks with which to study crime and criminal behaviour or to 'build bridges' between the social and biological sciences. Arguably 'agency is not synonymous with social effects' [Sibeon, 2004: 122]. Callon's [1986: 204] claim that scallops are actors, and Callon's [1991: 142] claim that the Chernobyl nuclear plant is an actor are clearly cases of reification. Clegg [1989:200], appears to have expressed something similar to Brown's [2006, 2013] concept of the merged human/cyber hybrid when he claimed that computer systems display agency, and that 'agency may be vested in non-human entities as diverse as machines, germs...and natural disasters'. Arguably, such views are misplaced and should be rejected.

There have been attempts to extend *Actor-Network theory* beyond studies of technology, power and organisation of the body into dialogue with feminisms, anthropology and psychology by Law [1999]. Williams-Jones and Graham [2003] have claimed that social, ethical and policy analysis of the issues arising from gene patenting and commercial genetic testing using human biotechnology is enhanced by the application of *Actor-Network theory*. They appear to be very much influenced by the approaches of Callon and Latour [1981], Callon [1986] and Latour [1987]. To reiterate, these approaches are also echoed in the work of Brown [2006, 2013]. As Bucchi [2004: 72] suggests, for the proponents of *Actor-Network theory*: A research colleague, a bibliographical citation in a paper, an apparatus which yields a microscope image, a company willing to invest in a research project, a virus that behaves in a certain way, the potential users of a technological innovation; all these are allies in the process that transforms a set of experimental

results and statements or a technological prototype into a 'black box'; a scientific fact or a technological product.

Bucchi [ibid: 70] also suggests that *Actor-Network theory* can be viewed as 'an attempt to expand the explanatory capacity of the microsociological approaches to science'. Williams-Jones and Graham [ibid] take the theories and go on to suggest that there is potential in transforming *Actor-Network theory's* 'flexible' nature [ibid: abstract] to an applied heuristic methodology for 'gathering empirical information and for analysing the complex networks involved in the development of genetic techniques'. The authors explore these concepts in their *New Genetics and Society* paper- *Actor-Network theory*, translation and drift- and apply these to the case of Myriad Genetics and their commercial BRACA analysis genetic susceptibility test for hereditary breast cancer. If we apply the meta-concept of reification to their work, we can clearly observe that the authors commit the 'cardinal sin' of reification- the illegitimate attribution of agency to entities which are not actors. Williams-Jones and Graham [ibid] treat the susceptibility test as an active participant in socio-technical networks. This is rather like Callon's [1986] treatment of scallops and Brown's [2006, 2013] reified view of a human/cyber merging. Williams-Jones and Graham [ibid] suggest that the test 'interacts with, shapes and is shaped by people, other technologies, and institutions', and that 'such an understanding enables more sophisticated and nuanced technology assessment, academic analysis, as well as public debate about the social, ethical and policy implications of the commercialisation of new genetic technologies'. It is hard to see how the authors could possibly justify their claim, because it is surely based upon a reified notion of agency on the part of 'the test'. How a test for the susceptibility of breast cancer can be capable of formulating and acting upon decisions is not explained by Williams-Jones and Graham [ibid].

Pickering's [2001] notion of *posthuman agency* has something in common with Brown's merged hybrids as it involves attributing agency to machines and physical objects [Sibeon, 2004; Owen, 2009], and is thus also a reified account. Pickering, as Jones [1996: 291] points out, allies himself 'in qualified fashion' with the *Actor-Network* programme in science studies championed by those such as Callon [1986] and Latour [1988]. As Jones [ibid] argues, *Actor-Network theory* 'finds its conceptual footing in the semiotics of French structuralist and poststructuralist thought'. It is, in essence, a form of 'antihumanism', depicting sociological explanation/description as 'illegitimate impositions of modernist categories' [ibid]. Callon and Latour [1981] contend that moderns having been subject to scientific representations must abandon human-centred forms of inquiry/expression if they are to develop what Jones [ibid] terms 'genuinely holistic appreciations of social life in its material settings'. Callon and Latour [1981] suggest instead a method of theorising associations between people and things that eschews all established ways of speaking about such relations. A decentred 'technoscience' is given primacy, in which 'society is no longer distinguished from the scientific, the technological, or the natural' [Jones, ibid]. The object of analysis becomes a 'unified field of "heterogeneous" networks that stitch together elements drawn from each of these "counterfeit" categories' [ibid]. By 'disrupting common sense appreciations of "mankind", "nature" and "society"- indeed by rejecting such classifications altogether', Callon and Latour [ibid] seek a 'new' approach to investigating the ways in which social life is 'enmeshed in technological projects' [Jones, ibid]. Jones makes the point that Pickering in his *posthumanism* 'concurs, generally, on the need for this strategy' and notes that Pickering and Cushing [1986: 561] have suggested that 'sociology has traditionally focussed upon human individuals and groups as the locus of understanding and explanation', and to remedy the problem as he sees it, now recommends a '*posthumanist* displacement of our interpretive frameworks'.

Jones [ibid: 292] makes the point that it is the concept of 'non-human agency', the idea that natural objects 'act' as human beings are able to do', that is 'the linchpin in the antihumanist argument'. For Jones, Pickering's point of view appears to be that neither sociology nor poststructuralism, nor *Actor-Network theory* 'can relate or distinguish with complete adequacy the 'performative' [ie concrete and temporal] qualities of things material, human and nonhuman' [Pickering, 1995b: 9-15]. Jones [ibid] poses the question, 'Has he got this right?' For Jones, the answer is in the negative. As far as we are concerned, in relation to the meta-concepts of the framework, the answer lies in the negative too. The *Genetic-Social* framework employed here employs a tightly-drawn, non-reified concept of the actor that borrows from Sibeon [2004]. Sibeon [ibid], it should be noted, acknowledges social actors [organisational actors] in addition to individual actors, who, in the latter case, must be able to [in principle] formulate and act upon

decisions. Pickering [1995b] is arguing for a *material agency*-material relations between people and things can be considered in terms of *human agency*. Sibeon [ibid: 147] usefully discusses the issue of whether machines are actors, in his case, specifically computer systems. The author makes the cogent point that 'inside many aircraft there are 'automatic pilots' and in all major airports air traffic control systems are computerised'. He goes on to mention that in the field of medicine, 'software is available for assisting in the diagnosis of illness', and that the 'industrial application of robots, in car manufacturing, for example, is highly advanced'. However, as Sibeon importantly makes clear, 'in each of these cases' the computerised decision-making is wholly 'dependent on hardware that is made and maintained by humans'. The computer software is 'bounded' by parameters that are determined and monitored by human programmers [ibid]. Sibeon does not deny the possibility that 'advances in computing hardware, software and bioengineering might in future prompt some revision of the anti-reified conception of actor [agent]' [ibid]. However, at this stage, it is merely reification to concur with Pickering's conception of *material* or *non-human agency*. To reiterate, it is the firm contention here that it would be a mistake to concur with Brown's [2013: 488] claim in relation to cyber-crime and 'Virtual Criminology' to the ends that critics of the latter school play down or ignore the 'merging of the human and the technical'. Arguably, it is not so much that critics of Virtual Criminology such as Grabosky [2001] and Owen [2014] downplay or ignore such things, but that they appear to realise that the agency in all cases comes from the human element. Computers are not actors capable of formulating and acting upon decisions and require programming by human agents.

To recap, in *Genetic-Social* theorising, we are arguing for a flexible picture of causality in which genes play a part, but environmental influences and the underlying mechanisms pertaining to psychology play a part also. The term *Neuro-Agency* is employed to replace the older term, 'agency' in order to properly acknowledge the influence of neurons in relation to human free-will and decision-making. *Psychobiography*, which refers to the unique, asocial aspects of the person such as inherited disposition must be taken into account too in any account of cyber-crime as is suggested in what follows.

### **Concluding Observations**

Brown's [2013:488] claim in relation to virtual criminology and cyber-crime to the ends that in increasing instances we are no longer able to distinguish 'human agency, culpability and motivation' from 'technology and non-human objects' is arguably an under-theorised and reified account of agency. As has hopefully been made clear here, in all cases of cyber-crime at this present time, whether they involve cybernetics, 'disembodied identities' and so on, the computerised decision-making is dependent upon hardware made and maintained by humans. In reality, there is no 'merging' of the human and machine. Brown's [ibid] account of agency, like those of the related schools of *Actor-Network theory* and *Posthumanism* revolves around reification, an illegitimate form of theoretical reasoning. Her notion of human agency and decision-making appears to neglect the evidence from behavioural genetics and evolutionary psychology for the role of genes in aspects of human behaviour [Tooby and Cosmides, 1992; Owen, 2009, 2014] and the evidence from neuroscience for the role of neurons in relation to human free-will [Dennett, 1981; Dennett et al, 2007; Moll et al 2005]. Brown's notion of the merged hybrid between human and technology does not hold water and no cyborg is yet capable of contemplating its own finitude in the Heideggerian sense.

There are distinct serious implications for social policy here because claims that a so-called 'merging' between the human and machine makes it difficult to distinguish human agency, motivations and culpability from non-human objects and cyber technology [Brown, ibid] could arguably lead to 'excuses' being made for online criminal offending. That may not be Brown's intention but the possibility is there. Indeed, it could be argued that this view amounts to an online perpetrator's charter. It is the contention here that when formulating policy in relation to online offending, we need to take into account notions of individual *Psychobiography*; the unique, asocial aspects of the person such as disposition. We need to acknowledge that biological factors may 'switch on' genetic impulses to generate behaviour that can be labelled as 'criminal' when they interact with other social and psychological factors. Human beings, rather than the non-human objects and technology referred to by Brown [ibid] are reflexive agents with the *Neuro-Agency* to choose not to engage in criminal activities where they believe that the rewards are outweighed by negative outcomes or actions which offend moral prohibitions.

It is the contention here that the *Genetic-Social* framework employed relies upon a flexible ontology involving methodological generalisations as opposed to substantive generalisations, and reflects the belief that even if reality is constructed there may still be a socially-constructed reality 'out there' [Owen, 2014]. However, we recognise that there are limits to any Realist ontology. As Polizzi [2011] implies, objective reality may exist but we remain unable to embrace it as an 'in itself' structure. In other words, the reality of the 'out there' is accessed from 'in here'. In an effort to move away from Newtonian thinking, the framework now adopts the Heideggerian concept of ontic truth. As Wrathall [2005:73] makes clear, Heidegger does not deny the legitimacy of using the word 'truth' to refer to a situation where assertions or beliefs are capable of being true or false by 'correctly representing' or 'agreeing with' or 'corresponding to' facts or states of affairs, and nor does he dispute that 'an assertion or a belief is true if and only if it agrees with or corresponds with the way things are'. However, Heidegger 'does deny that the truth of assertions and beliefs is the only, or even the most important kind of truth' [ibid]. Whilst the *Genetic-Social* framework rejects relativism it does acknowledge what Heidegger calls 'ontic truth' or 'the uncoveredness' of phenomena. There can be no 'truth' without Dasein, and 'truth happens'.

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