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Failing, hacking, passing: Autism, entanglement, and the ethics of transformation

Abstract

One of the most notable recent changes in autism science is the belief that autism is a heterogeneous condition with no singular essence. I argue that this notion of 'autistic heterogeneity' can be conceived as an 'agential cut' and traced to uncertainty work conducted by cognitive psychologists during the early 1990s. Researchers at this time overcame uncertainty in scientific theory by locating it within autism itself: epistemological uncertainty was interwoven with ontological indeterminacy and autism became heterogeneous and chance like, a condition determined by indeterminacy. This paper considers not only the conceptual significance of this move but also the impact upon forms of subjectivity. This analysis is undertaken by integrating the agential realism of Karen Barad with the historical ontology of Michel Foucault. I argue that these two approaches are, firstly, concerned with ontologies of emergence and, secondly, foreground the inherently ethical nature of change. As such these theories can be used to articulate an 'ethics of transformation'. I argue that the agential cut which brought about autistic heterogeneity is potentially problematic within an ethics of transformation, limiting the possibility of future change in subjectivity by imagining difference and resistance as properties of autism rather than the individual.

Key words

Karen Barad – Michel Foucault – autism – uncertainty – ethics of transformation – cognitive psychology

Introduction

Autism is widely understood as a neurodevelopmental condition (American Psychiatric Association 2013: 166) affecting around 1:100 individuals (Charman et al. 2011: 10) and for which neither cause nor cure is known (Bertoglio & Hendren 2009: 1). While there have been

significant changes to the core symptomology of autism over the past seventy years (Evans 2013), since the late 1970s there has been a consistent belief that autism is marked by social and communication impairments as well as restricted interests and repetitive behaviours (Feinstein 2010: 175).

One notable change in scientific understandings of autism, which has occurred since the 1980s, is the contemporary belief that autism is a particularly heterogeneous condition. It is now common for scientists to label autism a disorder of the 'idiosyncratic brain' (Hahamy et al. 2015), to refer to the 'autisms' (e.g. Geschwind & Levitt 2007), or suggest that we should 'give up on a single explanation for autism' (e.g. Happé et al. 2006. See also Singh (2016)). These assertions all attest to the fact that autism is described to be, by its very nature, aleatoric[1]. While it is not, of course, unusual to suggest that psychiatric classifications may be heterogeneous, the naturalisation and integration of heterogeneity into the ontology of autism, the assertion that the condition has no singular essence or defining feature, is certainly striking.

In this article I attempt to understand these narratives of heterogeneity, particularly their ethical and ontological consequences, with reference to a small body of research in cognitive psychology conducted in the early 1990s. I argue that the concept of a heterogeneous autism arises from uncertainty work undertaken within this research wherein epistemological uncertainties in scientific theory and experiment are understood as part of the ontology of autism. Uncertainty in work, in other words, came to be seen as evidence of indeterminacy in nature.

[1] The term 'aleatoric' is taken here from the work of Ian Hacking (e.g. Hacking 1975). To refer to an object as aleatoric is to suggest that it is, by nature of its ontology, chance like. Following both Hacking (e.g. Hacking 1995: 234) and Barad (2007: 115, 265) I use the word uncertainty to denote an epistemological claim of the sort "I am not sure what has really happened" whereas indeterminacy refers to a hard, ontological claim about the aleatoric state of the world. As will become apparent, in the current empirical example at least, the policing of this boundary is problematic.

Undoubtedly, a heterogeneous autism has flourished and diversified in the years since this initial research took place, filling an evolving 'ecological niche' (Hacking 2002b). Ever broadening behavioural diagnostic criteria (Verhoeff 2013: 443), the elusive nature of autism's genetic underpinnings (Navon 2011: 214), and the increasing number of voices from within self-advocacy movements emphasising their individuality (Moore 2014: 151), are all entangled with the heterogeneous nature of autism. Nonetheless, I argue that it is within this particular body of psychology research that an 'agential cut' takes place.

This paper seeks to understand this transformation of autism into a heterogeneous condition by drawing upon the ethico-onto-epistemological framework of Karen Barad; a framework which investigates not only transformations in the world but also centralises the inherently ethical nature of these changes. Like Barad, I explore these claims through a focus upon a small number of experiments which I argue are key to understanding the emergence of a heterogeneous autism.

Before this sustained empirical focus on autism, therefore, I flesh out the key conceptual tools offered by Barad and note the utility of the concept of an 'agential cut'. I then go on to explore their significance to the production of subjectivities within diagnostic contexts and, in doing so, draw affinities with the ethical project of Michel Foucault which, like Barad, considers the ethics of transformation. I then bring these frameworks together with a body of research in sociology and Science and Technology Studies which has explored the ways in which scientific researchers deal with uncertainty. These introductory discussions lay the foundations for the empirical body of the paper within which I argue that – in the particular diagnostic context at stake - scientific uncertainties have been diffracted through autism and played a decisive role in the emergence of a heterogeneous autism, a role that is not only of conceptual and practical significance but which also has important ethical consequences.

Ethico-onto-epistemologies of transformation

Barad's philosophy

In Meeting the Universe Halfway, Karen Barad argues that objects of scientific investigation cannot be disentangled from the apparatuses used to investigate them. Importantly, by 'apparatus' Barad does not only have in mind the equipment listed in a methods section. Rather, the apparatus includes the like of "class, nationalism, gender, and the politics of nationalism" among any number of other relevant material and discursive factors (Barad 2007: 165). Indeed, Barad's apparatus incorporates such a range of factors that it is hard to determine any outside of the apparatus at all; nothing is a priori excluded from influencing the nature of the object under investigation (see, for instance, the apparatus shown in Barad 2007, page 389).

Barad explores this key claim regarding the inseparability of measuring apparatuses and objects of analysis with reference to the famed uncertainty principle of Werner Heisenberg. Following Niels Bohr, Barad argues that it is an error to understand the uncertainty principle as an epistemological problem. It is not that we are uncertain about the qualities of particular entities - that we are unable to simultaneously measure position and momentum - rather it is that the entities in question are ontologically indeterminate and cannot meaningfully be said to have had those properties prior to interactions with the apparatus used to investigate them. Thus, Barad states:

> "… there aren't little things wandering aimlessly in the void that possess the complete set of properties that Newtonian physics assumes (e.g., position and momentum); rather, there is something fundamental about the nature of measurement interactions that, given particular measuring apparatus, certain properties become determinate, while others are specifically excluded." (Barad 2007: 19, italics in original)

There are several aspects to this claim which are relevant to the diagnosis of autism and which are worth elucidating further, not only in order to comprehend Barad's philosophy, but to grasp the conceptual and ethical thrust of her work.

Firstly, Barad is not arguing that there are not real, determinate things-in-the-world. Rather, it is suggesting that the world does not exist in stasis, that things are not timeless, and that they do not pre-exist their interactions[2]. Secondly, because the term interaction retains a sense of separate entities coming together (e.g. a measuring apparatus and an object of study), Barad coins the neologism 'intra-action' to reinforce the claim that there is nothing prior to interaction and that new entities are 'exteriorities within', their boundaries arising from the inside of existing phenomena. Finally, the point at which a determinate entity emerges following an intra-action, the point from which we are able to delineate "the object of investigation from the agencies of observation" (Barad 2007: 115) is known as an "agential cut". The agential cut is a crucial moment for not only are certain realities brought into being but other possibilities are necessarily excluded. Barad's example concerning the uncertainty principle makes this particularly obvious; at the moment when a particular intra-action brings into being a particle with a determinate property (e.g. momentum) another perfectly feasible possibility (e.g. a particle with a determinate position) is foreclosed.

These features of Barad's work make it valuable to the study of autism. There is, for example, no need to choose between the reality of the condition and the conclusion that

[2] As will be discussed at greater length in subsequent sections, there are strong affinities here between the work of Barad and Michel Foucault. Foucault referred favourably to 'historical nominalism' or 'historical ontology' (Davidson 2001: 36; see also Lemke 2011: 41-42) and this term has been taken up by several of his interlocutors, most notably Ian Hacking (e.g. Hacking 2007: 295; Madsen et al. 2013: 48). As Hacking says, "there is hardly a grain of so-called relativism" (Hacking 2002: 23) in this approach and, as Paul Veyne notes "there is no more relativism as soon as one has stopped opposing truth to time" (Veyne et al. 1993: 3). While Foucault and Barad understand history differently, what their approaches have in common is the centralisation of movement and becoming in ontological investigation. Where Barad departs from, or at least extends upon, these approaches is by incorporating non-humans and inanimate matter into her analyses (although see, Lemke 2015).

autism has been significantly shaped by social and historical factors including disciplinary norms and competition, educational strategies, deinstitutionalisation, and (self-)advocacy groups (Chamak 2008; Evans 2013; Hollin 2014; Navon & Eyal 2014; Silverman 2012; Verhoeff 2012). Instead of a concern with whether autism should be understood with reference to factors which are either 'inside' or 'outside' of science, attention is drawn towards a consideration of how autism has been delineated as an object of investigation, cut and re-cut from a particular apparatus which may readily include all of the aforementioned material and discursive factors. In the following section I will show how, firstly, these becomings and transformations in autism are fundamentally ethical in nature and, secondly, how an ethics of transformation can be formed by uniting Barad's work with that of Michel Foucault.

Ethics at the hinge of history

Barad's work is reminiscent of that by John Law and Annemarie Mol who, firstly, reject 'perspectivalist' views which assert that ontology is entirely separate from epistemology (Law 2004: 25) and, secondly, have conducted pioneering studies in the fields of medicine and diagnosis (Mol 2002). Where Barad's work complements these approaches is in, not only the consistent focus upon ethics, but also the form which ethical consideration might take. Barad insists that "we are responsible for the cuts we help enact" (Barad 2007: 180). Further, because the creation of new entities "always entails constitutive exclusions" (Barad 2007: 135), there is a highlighting of the fact that there are questions of accountability regarding what gets included and what is othered from the world. Agential cuts are inevitable (Hoffman et al. 2015: 676), but the types of object produced are not and, therefore, there is responsibility attached to the way that worlds have been, and will be, made.

This ethical centring is consistent with, and complimentary to, the ethical project of Michel Foucault, even if a consideration of his ethics is entirely absent from Meeting the Universe Halfway. Like Barad, Foucault's is an ethics of transformation. As Colin Koopman has recently argued, Foucault's genealogical endeavours operate on "the hinge between a history of the formation of the subject and the possibility of the future transformation of the subject" (Koopman 2013: 526)[3]. A similar argument is made by Lemke (2011: 32) who contests that Foucault's historical endeavours are not deconstructions for the sake of deconstructions but, rather, were intended to encourage what Foucault referred to elsewhere as 'limit-experiences' (e.g. Foucault 1994: 241-242), occasions which suggest new ways of being, potential transformation in the very matter of the universe (Miller 1993: 29).

On one plane of Foucault's work, therefore, we have the backward looking 'history of the formation of the subject' and, on the other side of the hinge, the 'limit-experience', the forward looking possibility of future transformation. It is in these territories where Foucault's project usefully intersects with Barad's. Koopman suggests that while Foucault engaged in extensive histories in order to provoke limit-experiences that would make possible transformations in subjectivity, it would be a mistake to view such transformations as an ethical commitment; "Foucault is not telling us that we ought to transform ourselves" (Koopman 2013: 530) and while "Genealogies can provoke in us the sense that we should change ourselves… they cannot place us under an obligation" (Koopman 2013: 528). Though

[3] While it is useful for present purposes, Barad may not endorse the metaphor of a 'hinge' which is suggestive of a 'past' on one side and a 'future' on the other. While Barad explicitly endorses genealogy as a methodology (Barad 2007: 390) she also states that "the "past" and the "future" are iteratively reworked and enfolded through the iterative practices of spacetimemattering" (Barad 2007: 315). Barad also states that "To the extent that Foucault presumes the presence of the past, or more generally the givenness of space and time, genealogy has been stopped short in its tracks" (Barad 2007: 474). Attempts to take Foucault's historical ontology to Barad have struggled to integrate her understanding of history as successfully as they have reworked her understanding of agency (e.g., Lemke 2015: 16). This is not necessarily so, however, as Ian Hacking's notion of 'an indeterminacy in the past' (Hacking 1995: 234-257) seems to demonstrate. Like Hacking, it is not the intention that the 'historical ontology' proposed in this article places a firm boundary between past and present. For a fuller discussion of Hacking's concept see Fuller (2002), Gustafsson (2010), Hacking (2003), Roth (2002) and Sharrock & Leudar (2002).

the historical nominalism (see footnote three) of Foucault therefore sees transformation as both a historical reality and a future inevitability, transformation also remains an ethical question precisely because there is no necessary form that transformation must take. Instead, it might be suggested, there is an accountability in determining which transformations are to be brought about. By theorizing 'the hinge' itself, the moment of transformation, the agential-cut, and by emphasising the inevitable exclusions inherent in such moments, Barad significantly furthers this body of thought. Barad makes us question and be accountable toward the limit-experiences and transformations we might bring about in ourselves, others, and the world while also considering the consequences of those cuts which have already been made.

In sum, I am arguing that by working Barad and Foucault through each other we have the beginnings of a framework for an ethics of transformation that may be of general utility. When considering autism in particular, this framework encourages us to dwell upon the delineation of, and subsequent changes in, the condition during the twentieth century as well as the inherently ethical nature of these changes. The empirical portion of this paper will consider the ethico-onto-epistemological consequences of one transformation in the object of autism; the incorporation of scientific uncertainties into the indeterminate bodies of autistic subjects.

Transformation and uncertainty

Uncertainty as a discursive structure

As noted previously, Barad insists that discourse and discursive structures are key to apparatuses and play essential roles in material reality. Des Fitzgerald has recently considered the discursive structures which play a fundamental role in autism neuroscience. While Fitzgerald begins by considering the discursive structure provided by hope, optimism, and

expectation within the life sciences (Fitzgerald 2014: 241), he quickly moves on to think about the importance of ambivalence and uncertainty. Indeed it seems to be increasingly evident that uncertainty and strategies to overcome uncertainty, so called 'practical uncertainty work' (Moreira et al. 2009; Pickersgill 2011; Pickersgill 2014), are entangled with the objects of scientific research.

While Barad seems to be content that many of the experiments under her consideration involve "the unambiguous communication of the results of reproducible experiments" (Barad 2007: 174) such reproducibility, as science studies has long shown, is hard won (Collins 1975) for uncertainties are intrinsic to scientific activity (Star 1985: 392). Of course, scientific research continues in the face of uncertainty and practical uncertainty work refers to the strategies taken by researchers in the wake of such uncertainties intended to make research 'do-able' (Fujimura 1987; Webster & Eriksson 2008). Numerous studies have begun to examine the diverse forms of uncertainty work undertaken by medical and scientific practitioners (Hollin & Pearce 2015; Mellor 2010; Pinch 1981; Shackley & Wynne 1996; Star 1985; Star 1989). What the strategies identified have in common is that they seek to disarm, displace, and deflate uncertainty, pushing it to the side-lines so that a certain science may continue.

In his analyses of uncertainty in relation to antisocial personality disorder (ASPD), for example, Pickersgill (2011, 2014) notes that there is widespread uncertainty amongst practitioners regarding both what ASPD is (Pickersgill calls this 'ontological uncertainty') and how it is best measured ('epistemological uncertainty'). Pickersgill notes, however, that these issues:

> "…can be set aside through recourse to the assumed certainty of the other: the existence of antisocial personality disorder and psychopathy as unified categories can

> be justified by the existence of their criteria for identification; likewise, the latter are validated by the fact that their use is long-standing and, therefore, that they 'work'. Thus [diagnostic] tools… and the psychopathologies they purport to identify become tightly bound together, co-producing the epistemological and ontological coherence of both mental health categories and their diagnostic criteria." (Pickersgill 2011: 84)

While Pickersgill here uses the language of co-production (Jasanoff 2004), these observations can usefully be understood in the language of Barad; the epistemologies and ontologies of ASPD are diffracted through one another, a process significantly affected by the uncertainty inherent in each, so that a new, stable, object of scientific investigation emerges; a particular incarnation of ASPD. The emergence of this object marks an 'agential cut' during which other possibilities are foreclosed and, as discussed above, Barad calls on us to be accountable for such world making activities. Similar conclusions of Pickersgill's have been reported elsewhere (e.g. Moreira et al. 2009: 671) and it is a core thesis of this paper that the nature of autism has also been radically shaped by uncertainty work.

Transformatory uncertainty and autism

The specific argument advanced in this paper is that while other professional visions have conducted uncertainty work with the intent of systematically erasing or displacing uncertainty (Goodwin 1994: 608), researchers studying autism have centralised it and diffracted it through the condition itself. Such uncertainty work has contributed towards a heterogeneous condition; an autism which is determined by its indeterminacy. This indeterminacy has become absolutely central to understandings of autism so that it can now be asserted that no two individuals with autism are the same and that an individual's symptoms cannot be explained with reference to a single causative factor.

With regards to these indeterminacies, it is not, as Foucault said of 18th century medicine, that "In order to know the truth of the pathological fact, the doctor must abstract the patient" (Foucault 2003: 7). It is not that the person obscures or confuses the essence of autism and that if only the individual could be pushed to one side, or controlled for in a laboratory setting, that the singular essence of autism would emerge. In the case of autism it is the condition itself which is described as indeterminate, chance like, and aleatoric.

This change in the ontology of autism has potentially crucial ethical consequences. Hacking gets to the crux of the issue in his discussion concerning the politics of retrospective diagnoses of post-traumatic stress disorder (PTSD). Hacking notes that pardoning soldiers executed for desertion during the First World War on the basis that they were suffering from PTSD deprives them of a degree of agency:

> 'The men are no longer said to have deserted, or at any rate, not to have deserted "in the first degree." This is because if they were suffering from post-traumatic stress disorder, they were not, strictly speaking, acting voluntarily.' (Hacking 1995: 241)

In this agential cut certain properties become tied to the object (PTSD) rather than the subject. This move has political and ethical consequences: On the one hand soldiers are absolved of their crime while on the other their agency is transformed into a property of PTSD itself. Likewise, in the case of a heterogeneous autism it is not the subject who is unique, resistant, or able to change but autism itself. The ethical consequences of this are worthy of consideration.

The empirical portion of this article is concerned with the emergence of this heterogeneous, indeterminate autism. I trace the agential cut responsible for this manifestation of autism to debates at the Cognitive Development Unit, University College London, during the early 1990s and contest that during this time uncertainty and indeterminacy were diffracted through

one another. I suggest that this moment can be understood as an agential cut; a point where autism took on a new form while alternative possibilities disappeared. Following this analysis I return to the ethical question of transformation as proposed by Barad and Foucault and suggest that one of the foreclosures instigated by the agential cut that led to an indeterminate autism is the possibility to "rebel against the classifiers" (Hacking 1995: 239) and to be understood outside of the diagnostic framework. The possibility of ushering in further transformation thus seems to be, at least partially, forestalled within contemporary understandings.

Hegemony in the UK: Materials and Context

As noted previously, contemporary research into autism is particularly concerned with uncertainty and indeterminacy; a conclusion manifest in numerous highly significant published pieces (e.g. Happé et al. 2006) and repeatedly re-affirmed within the social science literature (e.g. Fitzgerald 2014; Hollin online first; Verhoeff 2012). It is in the present, therefore, that this historical piece begins. This 'history of the present' (Foucault 1991: 31) has important affinities with Baradian analyses and focuses attention on both the agential cuts and ethics of transformation important to this piece, "making history work as a source for becoming different in the light of the contingency of the present and past likewise" (Fuggle et al. 2015: 3).

Given the above methodological positioning, papers considered here were selected by tracing backwards to a moment of apparent emergence (Foucault 1977: 148) and then radiating out so that the core contestations are captured and a corpus formed. While the published scientific literature considered here is central to the emergence of heterogeneity, this analysis is not intended to provide a totalizing picture or capture the whole of the Baradian apparatus. The focus is very much upon scientific representations of autism, to the detriment of those

voices emanating from outside of the academy. Nonetheless this research was a dominant force and, as noted above, remains of crucial importance in shaping the contemporary moment and its ethical character.

The institutional history within which a heterogeneous autism emerged is important. That history, as Bonnie Evans has made clear (Evans 2013; Evans 2014), involves the twinned institutions of the Maudsley Hospital and the Institute for Psychiatry (IoP) which were at the fore of experimental research into autism in the UK during the 1950s and 1960s. In 1964 Uta Frith joined the IoP initially for an internship and then, under the supervision of Neil O'Connor and Beate Hermelin, a doctorate (Bishop 2008: 17). In 1967 O'Connor and Hermelin tabled a bid to the Medical Research Council for a 'Developmental Psychology Unit' to be based at University College London (UCL; O'Connor 1975: 101) and Frith promptly followed across London Bridge to take up a position with them in Bloomsbury.

It was in the 1980s, however, that cognitive psychology came to dominate the field of autism research (Hollin 2014). This dominance arose following O'Connor's retirement and the subsequent appointment, in 1982, of John Morton to head the newly renamed 'Cognitive Development Unit' (CDU) at UCL (Bishop 2008: 18). The change in nomenclature was significant and, as Frith notes, Morton encouraged researchers to think "that the mind was not a big bowl of spaghetti tangles, but more like a building with different floors and rooms" (quoted in Feinstein 2010: 158). It was within this institutional nexus that, during the 1980s, Frith "defined contemporary research into atypical development" (Snowling et al. 2008: 13) and, as a special edition of the Quarterly Journal of Experimental Psychology demonstrates (Snowling et al. 2008), this task was aided by a stream of PhD students who have gone on to form a veritable 'who's who' of autism research; most notably, for present purposes, Simon Baron-Cohen and Francesca Happé (who also interned with O'Connor and Hermelin: Feinstein 2010: 159).

It is not that the work of these researchers was left uncontested within the academy; those from other research centres and disciplinary perspectives frequently contested the findings of those at CDU. For example, Peter Hobson, a psychologist sympathetic towards psychoanalytic understandings of autism, engaged in long and heated debates with these researchers during the late 1980s and early 1990s (see Hollin (2013: 94-103) for an overview of these disputes). Nonetheless psychology as a discipline was gaining significant sway over autism (Eyal et al. 2010: 111) and this school, in particular, was coming to hold a prominence it maintains today; Uta Frith is perhaps the world's most celebrated autism researcher, Simon Baron-Cohen arguably the most prominent autism researcher in the UK, and Francesca Happé sat on DSM-5's Neurodevelopmental Disorders work group.

X marks the spot: Cognitive homogeneity

As others have noted (Verhoeff 2014: 67) discussions of heterogeneity in autism certainly pre-existed the 1990s (e.g. Freeman 1977: 143). Those working at the CDU prior to the mid-1990s were not unaware of these existing claims of heterogeneity, but neither did they purport to have their work of mapping out a coherent condition undermined by them. Instead, cognitive scientists claimed to have located the space within which autism's truth and unity was to be found; the cognitive level. Thus autism was described as an 'X-shaped disorder' (Frith et al. 1991: 436) with heterogeneous biological causes and heterogeneous behavioural manifestations but, in between, a homogeneous cognitive profile.

Armed with such an understanding, research during the 1980s was frequently concerned with a 'grand theory of everything'; an attempt to find a cognitive explanation which would explain all of the features associated with autism. Two of the most prominent theories, which are also of most relevance to the emergence of heterogeneity in the 1990s, were the theory of metarepresentations and the theory of weak central coherence (WCC). While the analytic

thrust of this paper lies with later contestations of these theories, it is an important step to describe their key features. Importantly, both of these theories attempted to explain all aspects of autism, both within and between individuals.

Metarepresentation

The basis of the metarepresentation hypothesis is this: there are various instances during which people act on the world in ways which I, as an onlooker, know to be inconsistent with how the world really is. Sometimes these acts are intentional, for instance when someone uses a metaphor ('the brain is a Swiss army knife') or engages in pretend play ('I'll be Elvis'). On other occasions the inconsistency is accidental, such as when someone has a false belief about a scenario ('Kate believes the dog to be in its kennel, but I know it's escaped'). In all of these instances the current representation of the world (brain as knife; impersonator as Elvis; dog in kennel) is divorced from a second more accurate representation (brain as biological object; Elvis as dead (probably); dog as destroying living room). In the key theoretical paper related to the metarepresentation hypothesis, Alan Leslie argues that making sense of this bifurcation requires a specific piece of cognitive architecture known as a 'decoupling mechanism' which allows one to dissociate the current context from broader understandings (Leslie 1987: 419).

It is this decoupling mechanism which is posited to be dysfunctional in those with autism. On the basis of this single cognitive deficit, those with autism are expected to lack the ability to engage in pretend play, have an overly-literal interpretation of language (e.g. a failure to use or understand metaphor and irony; see, e.g., Happé 1993) and an inability to impute mental states, such as belief, onto other people. These three skills – pretend play, metaphor use, theory of mind ability – are taken to be indissociable within the metarepresentation account as they are all governed by the same cognitive module, the decoupling device. Various tasks

were developed to examine an individual's ability to form metarepresentations and by the end of the 1980s it was claimed that all individuals with autism were impaired in this regard. Thus, autism could be considered a "case of specific developmental delay" (Baron-Cohen 1989: 294)[4]. As might be expected from a disorder which was understood as having an 'X-shaped' profile, homogeneity was to be found at the cognitive level. This was also the case for the theory of 'weak central coherence', again developed by Uta Frith and colleagues at the CDU in the late 1980s, and intended to subsume the theory of metarepresentations and make up for its shortcomings.

Weak Central Coherence

The theory of weak central coherence (WCC; Frith 1989) was formulated in order to explain some of the typical strengths, as well as weaknesses, associated with individuals with autism. Importantly, when formulated it was suggested that the WCC might subsume the metarepresentation hypothesis (Frith 1989: 165) and detail the "one particular fault in central thought processes" (Frith 1989: 116); once again homogeneity was to be found at the cognitive level.

The WCC hypothesis itself is reasonably straightforward; the claim is that individuals with autism struggle to see the wood for the trees. Those with autism might be very good (indeed, better than average) at noticing detail but struggle to place those details within a broader context. Such a conclusion explains various deficits in autism, such as the tendency to mispronounce homophones like 'minute', presumably because the sentence context ('the

[4] Perhaps the most famous tests of metarepresentation ability are false belief tasks such as the 'Sally-Anne Test', developed by Wimmer and Perner in 1983 and deployed to examine theory of mind in autism shortly after (Baron-Cohen et al. 1985). The findings from false belief tasks were so striking that, for many, this theory of autism became known as the 'theory of mind' account of autism. At least in its initial articulation, however, this nomenclature is misleading. As this section has made clear, theory of mind impairments were articulated as a symptom of deeper cognitive impairment to a decoupling mechanism. This inability to decouple representations from each other – a deficit in forming metarepresentations – also explains poor metaphor use and a lack of pretend play. For further information on metarepresentations and the manner in which false belief tasks are underpinned by Alan Leslie's hypothesis see Hollin (2014: 104-107).

minute speck of dust', 'one minute past the hour') has not been accounted for. Simultaneously, however, WCC is able to explain various strengths; those diagnosed with autism, for example, seem to be faster at finding the location of a jigsaw puzzle piece within a picture, perhaps because not being distracted by the broader image is an advantage on this particular task (see Hollin (2014: 107-109) for more details).

Emerging uncertainties

While both the metarepresentations account of autism and the theory of WCC had accrued significant amounts of experimental evidence, by the 1990s difficulties with both theories were beginning to emerge. In 1992 Dermot Bowler published a paper which cast doubt on the claims of those at the CDU, particularly those associated with the metarepresentations account.

Bowler's study essentially re-ran an experiment conducted by Baron-Cohen in 1989 which examined second-order belief attribution. In the example of false belief given earlier it was stated that even though I know the dog is in the living room it is still possible that Kate believes the dog to be in the kennel. This ability is known as first-order belief attribution for one is required to impute a mental state onto one other agent (Kate). In an experiment published in 1985 Baron-Cohen and colleagues showed that over 80 per cent of those diagnosed with autism failed to demonstrate the capacity to make first-order belief attributions. Despite its landmark status, this paper's finding that a subset of those with autism could pass these tests was troubling for it would still seem to be possible to possess a theory of mind and have autism, suggesting an ability to create metarepresentations which should be impossible in the framework outlined by Leslie. In 1989 Baron-Cohen published a study which seemed to overcome this theoretical hurdle. Passing the test in this new experiment required the mental state of two individuals to be considered (e.g. 'where does

John think that Kate thinks the dog is?'), a harder skill known as second-order belief attribution. Baron-Cohen et al. found that even those individuals with autism able to make first-order belief attributions failed to make second-order attributions, once more making it conceivable that there was a specific developmental delay in metarepresentational abilities in autism.

Bowler examined second-order belief attribution skills in a group of individuals diagnosed with Asperger's (Bowler 1992: 883)[5]. Surprisingly, Bowler found that the majority of his participants were able to make second-order belief attributions and, what is more, success rates did not differ significantly from controls. Uncertainty increased further when these results were taken alongside two further pieces of information. Firstly, when participants were asked to provide justification for their answers, it was found that even those who passed consistently provided explanations without reference to second-order beliefs. In other words, justifications of the sort "because John thought that Kate thought" were virtually never uttered. This finding suggested that alternative routes, not requiring a theory of mind, could be taken to arrive at the correct solution to second-order belief attribution tests. Secondly, Bowler found that when the parents of those individuals making up the Asperger's group

[5] The relationship between autism and Asperger's syndrome has been, and continues to be, disputed and contested (Singh 2011). Research undertaken at the CDU frequently notes (e.g. Happé 1991; Happé 1994b; Frith et al. 1994) that sampled individuals meet criteria for 'Autistic Disorder', as defined in the Diagnostic and Statistical Manual III – Revised (DSM III-R; American Psychiatric Association 1987). DSM III-R makes no mention of Asperger's syndrome and Bowler draws his definition of Asperger's syndrome from a 1981 paper by Lorna Wing. Wing recommends the label of Asperger's on pragmatic grounds, believing it more acceptable to some parents (1981: 124), while also arguing that autism and Asperger's most likely "have in common impairment of certain aspects of brain function". Bowler, likewise, is formally agnostic on the separability of autism and Asperger's although he does note that the notion of an 'autistic continuum' advanced in Wing's paper: "…implies that people with Asperger's syndrome and people with classic autism as described by Kanner (1943) represent sub-sets of a larger population of people with social impairment" (Bowler 1992: 878). Bowler, at the very least, is demonstrably prepared to test hypotheses of autism by utilising a sample consisting of those diagnosed with Asperger's.

This discussion also makes clear that, while important, the emerging discussion of an 'autism spectrum' is not immediately related to the issue of cognitive heterogeneity and is broadly consistent with the 'X-shaped' disorder previously detailed by Frith (see above). Both Wing (Wing 1981: 124) and DSM III-R (American Psychiatric Association 1987: 33-34) argue that there are diverse causes for these conditions and diverse behavioural consequences with unity found between these two points.

were presented with a retrospective questionnaire they recalled little or no imaginary play during the childhood of their offspring. This finding suggested that some individuals with Asperger's may have theory of mind abilities but not the capacity to engage in pretend play.

Bowler was stinging in his criticism of the metarepresentations account of autism, making two key criticisms (Bowler 1992: 888-890). Firstly the seeming ability to pass these tests without the expected mind-based justifications suggests that the:

> "…ability to solve problems that involve a second-order theory of mind does not strongly depend on having developed either joint referencing or symbolic play skills" (Bowler 1992: 886).

Instead, it may be the case that effortful, logical, cognitive processes can also lead to the correct answers on these tests. Here, Bowler is introducing an epistemological uncertainty (Pickersgill 2011: 84) as there is the suggestion that these tests may simply not be measuring what they were intended to measure; the capacity to attribute beliefs to other individuals. Secondly, in the metarepresentation account put forward by Leslie (1987) pretend play and theory of mind abilities should be indissociable for the same cognitive module, the decoupling mechanism, was believed to govern both behaviours. That this Asperger's group did not, according to their parents, engage in pretend play as children and yet could pass theory of mind tests is therefore problematic as it challenges the connection between those abilities (Bowler 1992: 890). This is an ontological uncertainty (Pickersgill 2011: 84), a suggestion that the cognitive architecture posited to be at the node of the 'X', the decoupling mechanism crucial in giving autism its coherence, may not take the form anticipated. I argue that, in the wake of these findings, the 'uncertainty work' which entered into the material-discursive apparatus in order to make research on autism doable contributed significantly to a

novel agential cut. It is the nature of this agential cut which delineated a new, heterogeneous autism and which will be considered in the following section.

Diffracting uncertainties through ontologies

Those at CDU were aware of Bowler's findings long before they were submitted for publication. Indeed, Uta Frith's PhD student, Francesca Happé, spoke to Bowler about his results and considered them at length in her thesis (e.g. Happé 1991: 226).

Happé's thesis is concerned, primarily, with overcoming two uncertainties. Firstly, the reprocussions for the metarepresentation account of autism following the finding that some individuals with autism were able to pass second-order belief attribution tests (Bowler 1992; see also Ozonoff et al. 1991). Secondly, the proposed relationship between weak central coherence and metaresresentations, whereby a metarepresentational deficit is proposed as a consequence of WCC (Frith 1989: 163).

Hackers and Passers: Introducing interpersonal heterogeneity

As noted above, when individuals taking part in Bowler's study were asked to justify their beliefs, those who passed the test rarely considered mental states (see above, Bowler 1992: 883, 886). Perhaps, therefore, it is possible to pass second-order belief attribution tests without considering theory of mind at all? Such a conclusion would mean that Bowler's results would reflect not an intact theory of mind in research subjects but a capacity to find an alternative route to the desired destination in some particularly high functioning individuals. In a phrase first used by Happé in her thesis (e.g. Happé 1991: 78) and in press in 1994 (Frith et al. 1994: 110; Happé 1994: 130), such an ability to circumvent theory of mind tasks is called 'hacking out':

> "[Autistic individuals'] success could be seen not as proof of theory of mind ability, but rather as evidence of the "hacking out" of some strategy for solving the tasks." (Frith et al. 1994: 130)

The question to be asked was, therefore:

> "Are they [autistic individuals] simply better problem-solvers, more able to devise a strategy to answer theory of mind questions – thanks perhaps to more experience, higher IQ or a more social disposition?" (Happé 1993: 115)

Testing the hypothesis that individuals with autism were hacking out solutions to tests required some methodological innovation. Frith, Happé, and Siddons suggested that:

> "…"hacking" would enable individuals to solve false belief attribution tasks, but probably would not generalize to the large variety of mentalizing situations in real life" (Frith et al. 1994: 118).

The unique,dynamic environments encountered in 'real life' were expected to prove too much for the effortful hacking strategies proposed to underlie the success in belief attribution tests. This hypothesis was tested using a sample of 24 adolescents with autism, each of whom sat two classic, first-order tests. Eight of these individuals passed both tests and were labelled 'passers'. Meanwhile, a teacher or caregiver completed a questionnaire designed to assess an individual's 'adaptive' behaviour in the domains of "communication, daily living skills and socialisation"; this test was designed to examine theory of mind ability in the real life contexts in which hackers were proposed to struggle (Frith et al. 1994: 113).

Frith et al. report that individuals diagnosed with autism did indeed recieve particularly low scores on the socialisation portion of the questionnaire, unsurprising given that social impairment is a core symptom of autism. An additional finding was, however, that on questions which must be solved using theory of mind abilities, those 'passers' who could

476 complete first-order belief attribution tests scored significantly higher than those who failed.
477 This difference was found to stem, almost entirely, from three of the eight passers who scored
478 particularly highly on interactive sociability questions (Frith et al. 1994: 118). On the basis of
479 these three high scoring individuals the authors conclude that:

480 > "Our results, then suggest the existence of subgroups within the autistic spectrum. The
481 > majority have no understanding of other minds, and demonstrate "mind-blindness" in
482 > the laboratory as well as in everyday life. Then there are those who have learned
483 > limited strategies sufficient to pass highly structured artificial tests of theory of mind,
484 > but still show no evidence of mentalizing in real life. In addition, our results suggest
485 > that there is a third subgroup who appear to be able, to some extent, to represent
486 > mental states. They show evidence of this not only in the laboratory, but also in real
487 > life." (Frith et al. 1994: 118)

488 Those three individuals who 'pass' the questionnaire are deemed to be genuinely different to
489 those who fail or 'hack out' a solution – they really do possess a theory of mind.

490 The conclusions drawn within these literatures, which arise in direct response to the
491 uncertainties aroused by the work of Bowler, include some particularly noticable examples of
492 uncertainty work. As mentioned previously, Bowler raises two distinct uncertainties – an
493 epistemological uncertainty (do these tests measure what they purport to measure?) and an
494 ontological uncertainty (does Leslie's proposed decoupling mechanism exist?). Despite the
495 prolonged engagement with Bowler's paper from members of CDU (e.g. Frith & Happé
496 1994b; Frith & Happé 1994a; Frith et al. 1994; Happé 1991; Happé 1993; Happé 1994;
497 Happé 1994a; Happé 1994b) Bowler's ontological uncertainty is never investigated.
498 Uncertainty is instead transformed and condensed (Shackley & Wynne 1996: 283); there is a

recognition of the epistemological uncertainty and potential problems of method, which are duly explored, while the ontological claim about the nature of autism itself is ignored.

The epistemological uncertainty itself is tackled by slicing up experimental space in news ways. Within the literature under consideration there is extensive redescription of the tests through which cognitive hegemony over autism had been based. The experiments used to research first- and second-order belief attributions had previously been described as "ingenious" (Baron-Cohen et al. 1985: 39) and were explicitly stated to converge with real life (Wimmer & Perner 1983: 124). There was, thus, no suggestion that laboratory findings should be seen as particularly problematic or that the laboratory consistuted a space with distinct properties. In the wake of Bowler's uncertainties, however, these experiments are seen to constitute 'highly structured artificial tests' which cannot be taken for granted and need to be investigated. There is a sharp break inserted between the space of the laboratory and the 'dynamic real world', a strategy for dealing with uncertainty which can be called 'spatial segmentation'.

The term 'spatial segmentation' draws upon Star's notion of 'temporal segmentation' (Star 1985: 400). Temporal segmentation refers to a form of uncertainty work wherein researchers offer only a provisional diagnosis of an ongoing uncertainty and wait until the conclusion of that event before accommodating any uncertain, local features into existing understandings. Some (longer) time frames are thus constructed as both separate and more meaningful than other (shorter) time frames. In this instance, I am suggesting that space (rather than time) is cut up in new ways in order to cope with uncertainty. One space ('the dynamic real world') is deemed more relevant to the ontology of autism than another (the laboratory). Uncertain findings in the laboratory are judged to be provisional until compared with that second space and are subsequently reinterpreted in the wake of findings in 'the real world'.

This spatial segmentation ensures that there is a tight binding of uncertainty to a particular space, the laboratory, and enables uncertainties to be corraled within that setting where they can be systematically managed (Shackley & Wynne 1996: 281). What is more, once autism has been diffracted through these newly segmented spaces, new subgroups begin to be delineated and passers, hackers, and failers emerge as meaningful and distinct groups. Indeed, following the finding that all epistemological uncertainties actually stem from an ontologically distinct group of passers it becomes apparent that the theory of mind account is still relevant, and indeed validated, for both failers and hackers. Uncertainty is thus dealt with by being located within autism itself, so that epistemological uncertainties become entwined with ontological indeterminancies.

Within this research practical uncertainty work is becoming entangled with the ontological reality of autism. Further, and importantly, the agential cut which has demarcated autism from the apparatus used to investigate it has placed uncertainty on the 'object' side of the object/instrument split: an indeterminate object rather than an uncertain instrument. Once uncertainty is managed in this way new classifications – failers, hackers, and passers - are deliniated as objects of scientific investigation. The terms emege as 'exteriorities within' the condition and autism itself becomes interpersonally heterogeneous. It is the emergence of these new groupings, and the addition of 'heterogeneity' to conceptual repertoire and apparatus used to study autism, which I argue constitutes an agential cut.

No single explanation: Intra-personal heterogeneity

While uncertainties over the metarepresentation account of autism were countered through reference to an interpersonally heterogeneous condition, what is less clear is why 'passers' should still be considered within the rubric of autism given their fundamental difference to the other two sub-groups. This uncertainty is, however, off-set through reference to WCC. As

will be recalled, in 1989 Uta Frith suggested that it was possible to explain metarepresentation deficits as stemming from WCC in individuals with autism. Thus, while there is interpersonal heterogeneity in relation to metarepresentation there remains in WCC the possibility of a deeper cognitive unity. Indeed, Happé explicitly asserts that failers, hackers, and passers could all be incorporated within a WCC framework (1994: 146).

This hypothesis was examined in a further paper of 1994 (Happé 1994b). Here Happé gave I.Q. tests to 51 individuals with autism, 21 of whom were able to pass first-order belief attributions tests and 30 of whom failed such tests. The I.Q. test used in this study, the Wechsler Intelligence Scales, can be divided into four subsections. Individuals with autism frequently have a 'spikey' I.Q. profile on this test, meaning that whereas individuals in control groups normally score equally across the different subsections, those with autism often show relative peaks of performance on subsections favouring local processing (the 'block design' and 'digit span' sections which, to continue with a 'wood for the trees' analogy, require a focus upon trees) and relative weaknesses on areas which may require theory of mind ('comprehension' and 'picture arrangement' subsections; see Happé 1994b: 1463-1465 for further details).

Happé reports a significant difference on the comprehension subsection of the I.Q. test, with those who could pass theory of mind tasks demonstrating a relative strength while failers show a relative weakness. Happé concludes, therefore, that the comprehension subsection of the I.Q. test requires theory of mind. However there was no significant difference between the groups on the other subsections; both groups showed strengths on the block design and digit span subsections, while no particular pattern was found in the picture arrangement subsection. Happé thus reaches the following conclusion:

> "...weak central coherence is a feature of the information processing of all autistic subjects regardless of theory of mind ability. It is possible that some autistic subjects will show impaired Block Design performance, due for example to superimposed spatial processing deficits. The central coherence hypothesis predicts, however, that where errors occur they should be predominantly of a type which violates the whole form but preserves pattern details. Indeed, preliminary error analysis of an independent autistic sample, appears to confirm this prediction." (Happé 1994b: 1469)

This finding appears to support the notion of cognitive homogeneity; all individuals, regardless of theory of mind ability, seem to show WCC. However, the WCC hypothesis also posits that WCC should be negatively correlated with theory of mind deficits; greater WCC should equal poorer theory of mind ability. If better performance on the block design subsection is demonstrative of greater WCC, therefore, one would expect to see greater peaks of performance in Happé's theory of mind failers. This is not found and, thus, it was concluded that WCC could not account for theory of mind performance:

> "The independence of Block Design and Digit Span performance peaks from theory of mind tasks success suggests that the postulated weak central coherence must be thought of as separate from the mentalising impairment in autism. This is a change from Frith's (1989) original position..." (Happé 1994b: 1469)

The possibility that WCC is found universally in autism remains following the findings of Happé. The notion that WCC and theory of mind abilities are not correlated, however, suggests that WCC cannot be used to explain theory of mind impairments. What is more, and as detailed in the sections above, the splitting of autism into subgroups has confirmed the importance of theory of mind impairments in the majority of cases. There thus seem to be two, unrelated, theories that are essential to understanding autism but which are causally

unrelated and, indeed, not manifest in every case. The authors extricate themselves from this uncertain situation by suggesting that autism is not only interpersonally heterogeneous but also intrapersonally heterogeneous; both WCC and theory of mind impairments are typical of autism but cannot be used to explain each other and, instead, need to be considered independently.

Summary

It is worth considering these conclusions carefully, as they are particularly knotty. Firstly, epistemological uncertainty over the metarepresentation hypothesis of autism was offset through reference to three ontologically discrete populations within the spectrum; passers, hackers, and failers. It was then shown that theory of mind was relevant to the latter two of these sub-groups. These practices ensured that theory of mind must continue to be conceived as crucial to understanding autism in the majority of cases, a conclusion reaffirmed in a paper entitled 'autism: beyond "theory of mind"' where Frith and Happé state:

> "At present, all the evidence suggests that we should retain the idea of a modular and specific mentalizing [theory of mind] deficit in our causal explanation of the triad of impairment in autism. It is still our belief that nothing captures the essence of autism so precisely as the idea of mindblindness." (Frith & Happé 1994a: 126)

WCC was also necessary to this understanding of autism however as, following the finding that not all individuals with autism have theory of mind deficits, WCC provided some level of interpersonal coherence. However WCC at the same time proved unable to explain theory of mind symptoms of autism, as was initially suggested:

> "...this explanation alone will not suffice. Therefore, our present conception is that there may be two rather difference cognitive characteristics that underlie autism." (Frith & Happé 1994a: 126)

The theory of mind account of autism, therefore, only makes sense across the clinical population in the presence of WCC, for the theory of WCC shows an underlying unity in an apparently heterogeneous population. At the same time, WCC can only explain autism within a particular individual if theory of mind is retained as a separate and discrete concept, for WCC abilities do not seem to correlate with theory of mind skills. The uncertainties inherent in each theory, and the inter-relations between them, are diffracted through one another and construct autism as an indeterminate condition, a disorder to be understood as both intra- and inter-personally heterogeneous.

The significance – ontologically, epistemologically and of course ethically - of the agential cut enacted in this research, and the form of autism delineated by it, is made apparent if one compares the above quotes with one made just three years earlier by Uta Frith:

> "...if future research comes to the conclusion that the core impairments in autism are different and have different underlying causes, then this [cognitive] convergence would vanish, and, in the absence of convergence at the biological level, the justification for the single term 'autism' would be removed" (Frith et al. 1991: 438)

This is a straightforward assertion that autism is an 'X-shaped' syndrome, with associated symptoms stemming from a single cognitive cause. Just three years later, uncertainties in various theories had diffracted through the condition itself and autism had become indeterminate and heterogeneous. This change, I suggest, is of ethical importance. Barad states that:

> "Ethics is about mattering, about taking account of the entangled materializations of which we are a part, including new configurations, new subjectivities, new possibilities – even the smallest cut matters." (Barad 2007: 384)

The discussion of this paper will consider this new configuration of autism, the new subjectivities which emerge and, crucially, the new possibilities which now exist.

Discussion

Agential cuts

To summarise; Barad describes an agential cut, and its consequences, as follows:

> "…a local cut that produces "objects" of particular knowledge practices within the particular phenomena… [The] apparatus specifies an agential cut that enacts a resolution… of the semantic, as well as ontic, indeterminacy. Hence apparatuses are boundary-making practices." (Barad 2007: 147-148, italics removed)

An agential cut, therefore, is the moment when a novel, boundaried object emerges as a result of the material-discursive features of a particular apparatus. Simultaneously, this enactment necessitates exclusions as other possibilities are foreclosed and Barad's ethics centre upon these exclusions. I argued during the introduction that an agential cut can be considered as being akin to a 'hinge' and that an investigation concerning the assembly of an apparatus which produces a cut could be articulated as Foucauldian history (of the formation of the subject, in this instance).

Empirically, I have sought to stay close to both Barad, focusing upon a small number of scientific experiments, and Foucault, by attempting to tease out the tangled origins of an apparently natural concept. I have argued that the small body of research conducted during the 1990s constituted an 'agential cut' wherein a particular object emerged - an indeterminate autism – and that uncertainty and 'practical uncertainty work' (Moreira et al. 2009; Pickersgill 2011) aimed at making research 'doable' (Webster & Eriksson 2008) was a crucial feature within the apparatus.

664 This research into autism is important for two reasons. Firstly, and generally, attention is
665 drawn to uncertainty and uncertainty work as a potentially important and unstable part of an
666 apparatus. Secondly, and specifically, the emergence of a heterogeneous autism has been
667 significant within the field of autism research. Indeed, narratives which I trace back to these
668 discussions in the early 1990s have, over the subsequent 20 years, arguably become the
669 dominant way to think about autism.

670 The ethics of transformation

671 In this analysis I have attempted to not only undertake a history of the formation of autism
672 but also to open space for an ethical consideration of the exclusions necessitated in this
673 particular becoming. It is with the second of these matters which I conclude.

674 Any form of engagement with medical and psychiatric services may force individuals into
675 particular forms of agency and subjectivity (Callon & Rabeharisoa 2004). This is hardly
676 news, and Ian Hacking's previously mentioned discussion of PTSD makes the ethical stakes
677 of these debates clear; the agency – or, at least, the form of agency – previously tied to
678 deserting soldiers was 'cut' from them and tied to PTSD. As Hacking noted (1995: 241) this
679 drastically decreases the range of acts available to the individuals concerned.

680 One of the core claims about autism is that a particular individual is socially atypical. Social
681 (dys)functioning, which might be thought of as a dynamic, contextually dependent, and co-
682 produced achievement (Rapley 2004), is instead re-imagined as a permanent property of a
683 particular diagnostic entity, outside of the situation or the subject's control. At the centre of
684 the object of autism, as with PTSD, sits a denial of subjectivity and a refusal to acknowledge
685 that things could have been different. The ethical significance of heterogeneity is that it
686 radically extends the passivity attributed to the autistic subject. Consider the 'passers' and
687 'hackers' who are delineated in the cut examined in this article. These individuals were still

corralled into the diagnostic pen; their motives, actions, and dispositions may have allowed them to escape the test in question but they could not escape a heterogeneous autism. Agency, difference, and resistance were re-imagined not as a property of subjects but as a property of autism, accounted for by its heterogeneous nature.

This is not to say that autistic subjects have been anything like silenced by these cuts. These discourses have been picked up, modified, and appropriated (O'Neil 2008; Ortega 2009; Singh 2011). This is perhaps most obvious in the use of multi-coloured jigsaw pieces to symbolise autism and the assertion that 'if you've met one person with autism, you've met one person with autism' (Moore 2014: 151). This does not alter the fact that heterogeneity places limits on these forms of engagement or that heterogeneity makes certain forms of engagement hard/impossible; Hacking's soldiers with PTSD, and their relatives, could surely 'rebel against the classifiers' through a range of means but it is literally unthinkable that they could desert in the first degree. Despite significant mouldings, the individuals discussed here are, likewise, still understood as autistic. It is these matters which should be a central concern for an ethics of transformation.

I do not wish to suggest that the lack of unity in the population diagnosed with autism demonstrates that the classification is fundamentally misguided – nor that the researchers in question acted with anything other than honesty and with integrity. One of the benefits of the Baradian/Foucauldian framework within which this article is situated is that there is no need to choose between the temporal nature of autism as a diagnosis and the reality of the condition. This framework does not suggest that the autism of those diagnosed today is more or less real that those diagnosed in the 1980s. What is contended, however is that there is "the need for an ethics of responsibility and accountability not only for what we know, how we know, and what we do but, in part, for what exists" (Barad 2007: 243). As Foucault notes, there is no obligation to transform a heterogeneous autism simply because we can examine its

knotted origins in the early 1990s; what we must ask, however, is if the benefits of diagnosis are worth the costs of understanding forms of social difference as inescapably pathological.

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