

Mentalism and Mechanism

the twin modes of human cognition

Christopher Badcock PhD.,
Reader in Sociology, University of London

The following article, commissioned as a chapter to appear in *Human Nature and Social Values: Implications of Evolutionary Psychology for Public Policy* edited by Charles Crawford & Catherine Salmon (Erlbaum, 2003), sets out a new paradigm for thinking about many fundamental controversies in human thought – especially the fact/value, science/humanities, nature/nurture and mind/brain ones.

Anti-mentalism

Much of the difficulty that people have had in the past with evolutionary approaches to human psychology and behaviour arose from the tendency of twentieth-century evolutionists to ignore the mind and concentrate wholly on genes and/or behaviour. According to George Williams, one of the most important of twentieth-century Darwinists:

only confusion can arise from the use of an animal-mind concept in any explanatory role in biological studies of behaviour. ... Mind may be self evident to most people, but I see only a remote possibility of its being made logically or empirically evident. ... I feel intuitively that my daughter's horse has a mind. I am even more convinced that my daughter has. Neither conclusion is supported by reason or evidence. Only if it violates physical laws would mind be a factor that biologists would have to deal with. ... There is no such evidence for mind as an entity that interferes with physical processes, and therefore there can be no physical or biological science of mind. ... no kind of material reductionism can approach any mental phenomenon.

Williams concludes that the 'solution to the non-objectivity of mind' is 'to exclude mind from all biological discussion'. Elsewhere Williams castigates what he calls 'lubricious slides into discussions of pleasure and anxiety and other concepts proper to the mental domain' as nothing other than 'flights of unreason' on the part of authors who 'claim to

have provided a physical explanation of mental phenomena' (Williams, 1985; Williams, 1996).

Anti-mentalism was typical of most twentieth-century Darwinists and students of animal behaviour. Similar comments to those of Williams quoted just now can be found in the work of the ethologists, Niko Tinbergen (1907-88) and Konrad Lorenz (1903-89). These writers concentrated on observed behaviour and mistrusted mental terms, which were often dismissed as 'anthropomorphic' (that is, committing the error of attributing human thoughts and feelings to animals). Such views have been perpetuated and popularized by their pupils, such as Dawkins (Dawkins, 1995).

To this extent, evolutionary anti-mentalism resembled that of the behaviourist movement, which dominated mid-twentieth century academic psychology. Behaviourism derived its name from its dogmatic assertion that the mind was a 'black box' that could not be opened and whose internal workings science could not speculate about. All that could be studied objectively was what went into it in the form of stimuli and what came out of it as observed behaviour. Nothing else could be said. Behaviourism was the study of behaviour, not of the mind – mindless psychology, if ever there was.

The result of such views was what you might call evolutionary, genetic or ethological behaviourism: 'explanations' of behaviour that went directly from the evolutionary, genetic, or ethological factors proposed to the observed behavioural result. Such an approach neglected the mental level of explanation altogether, and at times left you wondering why organisms that have them have minds at all – so irrelevant did they seem to behaviour. Where human beings were concerned, evolutionary, genetic or ethological behaviourism prompted understandable protests that such an approach was 'reductionistic' and diminished people to the status of mindless robots, controlled by their genes or evolutionary programming to act in ways essentially no different from the way in which an ant or an amoeba might behave.

Theory of mind

According to Premack and Woodruff, who originated the term, *theory of mind* describes the ability to infer that other people experience mental states like our own. They claim that such a capacity may properly be viewed as a theory because mental states are not directly observable, and can be used to make predictions about the behaviours of others (Premack & Woodruff, 1978).

Conversely, the inability to attribute such states to others that is seen in *autism* has been graphically described as 'mindblindness'. People with autism tend to be insensitive to other people's feelings, are poor at interpreting others' intentions, beliefs and knowledge, and often fail to anticipate the reactions that other people will have to their behaviour. They have difficulty dealing with misunderstandings, and are often unable to practice,

detect, or understand deception. The result is that their behaviour often seems bizarre, callous, or childish to others (Baron-Cohen & Howlin, 1993).

Experiments suggest that normal children acquire a theory of mind between the ages of three and five, but that autistic children are notably lacking in this respect. Studies show that autistic children do not differ from others in their ability to understand the functions of an internal organ like the heart. Nor are they deficient in their knowledge about the location of organs such as liver or brain. However, whereas other children are able to understand that the brain has purely mental functions, autistic children tend to associate it only with behavioural functions, so that it appears that specifically mental, unobservable events are beyond their comprehension. As Simon Baron-Cohen puts it, 'Lacking a theory of mind is in one sense akin to viewing the world as a behaviorist' (Baron-Cohen, 1989).

Today a great deal of evidence of many kinds has accumulated in support of the view that theory of mind deficits characterize autism (Baron-Cohen, Tager-Flusberg, & Cohen, 2000). Indeed, research has even begun to reveal the brain structures that might be involved. In a recent experiment using brain-imaging, ten autistic and ten normal subjects viewed animations of two moving triangles on a screen in three different conditions: moving randomly, moving in a goal-directed fashion (chasing, fighting), and moving interactively with implied intentions (coaxing, tricking). The last condition frequently elicited descriptions in terms of mental states that viewers attributed to the triangles. The autism group gave fewer and less accurate descriptions of these latter animations, but equally accurate descriptions of the other animations compared with the controls. While viewing animations that elicited mentalizing, in contrast to randomly moving shapes, the normal group showed increased activation in parts of the brain previously identified with theory of mind functions. The autism group showed less activation than the normal group in all these regions (Castelli, Frith, Happé, & Frith, 2002).

Direction of gaze

From an evolutionary point of view, a plausible origin for theory of mind might be found in *direction of gaze*. Primates are typified by forward-rotated eyes, often to the extent that the visual axes of the eyes are practically parallel (as in the human case). The benefit of this is excellent stereoscopic vision, which would have served their ancestors well in the arboreal habitat in which primates almost certainly first evolved. However, the cost is a notable reduction in field of vision, particularly when compared with the almost panoramic view enjoyed by most mammals whose visual fields normally only overlap to a limited amount at the front, leaving only a small blind area behind the head. The result is that primates have become more social (and more vocal) so as to gain the advantage of many different pairs of eyes (Allman, 1999).

Primates have also compensated by becoming sensitive to the direction of gaze of others.

This is particularly important because, not only can it tell you where the others in the group are looking, it can also give useful clues about what they are seeing, their state of mind, and intentions. (Indeed, an analogy now exists in military technology: radars function essentially like eyes, and like them can be directed. Rules of engagement in some recent conflicts have allowed pilots to interpret a lock-on to their aircraft by an enemy radar as hostile, and to react immediately rather than wait for the missile-launch or gun-attack that might be expected to follow.)

In other words, not only may direction of gaze have an important social dimension in primates like human beings, it also may have evolved as a critical and fundamental factor in primate sociality from the beginning. What might at first have seemed an after-effect of social behaviour, or a trivial detail in it, now begins to take on the appearance of a central, strategic social adaptation.

There is now good evidence that autistics are notably lacking in awareness of direction of gaze, and are poor at interpreting its psychological significance. If there is indeed a mental module specialized for gaze-monitoring as some have speculated, it appears to be defective in their case. However, there are also reasons for thinking that it could be over-active, or at least that some people may over-interpret its output. Here the best example is the delusion of being watched or spied-on that is so typical of paranoia.

The most famous paranoiac in the psychiatric literature was Daniel Paul Schreber (1842-1911), a German high-court judge who published an autobiographical account of his illness that was later the subject of a paper by Sigmund Freud (Freud, 1911; Schreber, 1903). Schreber included in it a section entitled 'Direction of Gaze' long before the subject had been introduced into discussions of theory of mind (chapter XVIII). According to Schreber the sun was a living being who spoke to him in human language, or was the organ of a higher being lying behind it (Schreber, 1903:47). Although impossible before his illness, in the course of it Schreber believed he could look at the sun without blinking – indeed, the sun's rays visibly paled before him when he did so (quoted by Freud, 1911: 53-4).

Schreber also often railed at the sun, which at times he saw as God's eye, and paranoiacs are often morbidly sensitive to other people's direction of gaze to the extent of interpreting it as hostile and/or intrusive. Indeed, they sometimes feel that they are being watched even when no one is there. Nowadays they often extend this naturally-evolved sensitivity about direction of gaze to modern technological surrogates for it, and become similarly pathologically pre-occupied with cameras, closed-circuit TV and ray- or radiation-producing mechanisms of many different kinds. Such delusions might fit nicely under another of Schreber's headings: 'Egocentricity of the rays regarding my person' (Schreber, 1903, chapter XX). Indeed, Harry Stack Sullivan (1892-1949), a psychiatrist famed for treating schizophrenics, advised his colleagues to sit at the side of such a patient rather than facing them, never to look them in the eyes (which he found created

suspicion), and to address them in the third person (personal communication from Dr Andy Thompson, quoted with thanks by kind permission).

Mentalism

Another deficit found in autism is an ability to judge and interpret others' intentions towards oneself: what Baron-Cohen calls *intentionality detection*. Autistic people often fail to pick up cues directed at them in otherwise obvious and unmistakable ways, and are poor at interpreting body-language or judging the implications of others' statements and behaviour. Indeed, autistic children notably make pronoun-reversal errors, referring to themselves as 'you' and their mothers as 'I' or 'me'. However, language-impaired controls, such as sufferers from Down syndrome, do not make comparable errors, despite their poor speech competence (Baron-Cohen, 1989).

If autistics are deficient in this respect, then paranoiacs are notable in detecting intentions far too readily, and in over-interpreting their significance for themselves. Furthermore, this over-sensitivity to intention can take two forms, depending on whether the intention is positive or negative. Positive over-interpretation of other's intentions underlies *erotomania*. In this case, the subject delusionally believes that others are attracted to, or are in love with them. However, negative over-valuation of intention is much more common and seen in the delusions of persecution which are found in so many paranoiacs. Here, as usual, Schreber was no exception:

a conspiracy against me was brought to a head ... its object was to contrive that ... I should be handed over to a certain person in a particular manner ... my soul was to be delivered up to him, but my body ... was to be transformed into a female body, and as such surrendered to the person in question with a view to sexual abuse ... (Freud, 1911:19)

Indeed, Schreber's delusional system centred on a universal struggle of good against evil in which Schreber himself played a central Christ-like role as the persecuted saviour of the human race.

Another autistic deficit is found in what Baron-Cohen calls *shared attention mechanism*. Autistic people typically do not become involved in group conversations or activities because they usually fail to understand the element of collective psychological activity that is inevitably involved. Once again, paranoiacs are characteristically at the opposite extreme and are given to imagining concerted group activity often expressed as conspiracies against them, as the last quotation above illustrates. To take another example, Schreber noticed that, every time he need to go himself,

some other person in my vicinity was sent (by having his nerves stimulated for that purpose) to the lavatory, in order to prevent me evacuating. This is a phenomenon

which I have observed for years and upon such countless occasions – thousands of them – and with such regularity, as to exclude any possibility of its being attributable to chance. (Freud, 1911:26)

Finally, as we have already seen, autistic people are deficient in theory of mind: they fail to attribute mental states to others and to react to them accordingly. Here again, paranoia shows the opposite tendency. In Schreber's case this was a readiness to attribute minds – or what he actually called 'bemiracled residues of former human souls' – to birds and trees and generally to mentalize – he would have called it to 'spiritualize' – the whole world (Freud, 1911:17). Hence the Sun's rays were by turns the 'nerves of God' or 'God's spermatozoa'. The entire universe became the stage for a spiritual drama centering on Schreber and his eventual redemption of the world through his transformation into a woman who would give birth to a new race of men (Schreber, 1903).

Adopting the modular view of the mind that has become popular with evolutionary psychology, Baron-Cohen sums up his approach by suggesting that autistics may have deficits in four particular modules (Baron-Cohen, 1995). We might summarize the argument above to add that, if autistics are characterized by deficits in the mental modules listed by Baron-Cohen, paranoiacs might be regarded as characterized by their expression in excess:

- ! Eye Direction Detection (delusions of being watched)
- ! Intentionality Detection (delusions of persecution/erotomania)
- ! Shared Attention Mechanism (delusions of conspiracy)
- ! Theory of Mind Mechanism (religious/mystical delusions)

Although currently fashionable with many evolutionary psychologists, modular thinking has its critics (even including one of its founders (Fodor, 2000)). One limitation of the modular approach to the factors listed immediately above is that it suggests that each is a separate, discreet, all-or-nothing functioning sub-unit of the mind, with little overlap or possibility of variation. Nevertheless, this is not the only way to see it. Making the same point in different terms to Baron-Cohen's mental modules, you could say that whereas autism was characteristically *hypo*-mentalist (too little mentalistic thinking), paranoia was *hyper*-mentalist (too much). This in turn would suggest that *mentalism* – the ability to attribute minds to others, and to interpret and understand mental states – was not an all-or-nothing phenomenon of human psychology, but covered a continuum stretching from the extremes of hypo-mentalism in severe autism to hyper-mentalism in cases of paranoia like Schreber's.

Mentalism, then, is the language that human beings use to talk about their own behaviour. It uses verbs like think, feel, intend, believe, foresee, wish, know and understand; adjectives like good, bad, moral, immoral, right, wrong, true, false, evil, criminal, human and divine; nouns like mind, soul, spirit, motive, aim, desire, love, hate, justice and

desert. Mentalism invokes conditions like consciousness, righteousness, redemption, knowledge, ignorance, obligation and culpability, and enables its practitioners a unique ability to travel mentally through time in both directions: imaginatively into the future and retrospectively into the past (Suddendorf & Corballis, 1997).

To put it another way, you could say that mentalism is characteristically human in that it allows us to name, blame and shame (or alternatively to except, exonerate and extol). Indeed, this almost certainly explains much of the evolution of mentalism: not just a useful grammar of mental agency, but an effective psychological tool with which to manipulate and influence the behaviour of others. How else could people be motivated to act in the name of purely abstract – that is, mentalistic – concepts like justice, truth or equality? And what else would we regard as characteristically, definitively and quintessentially human than action motivated by such ideals?

Although not one of Baron-Cohen's defective modules, language is yet another mentalistic phenomenon that fits the hypo-/hyper-mentalistic pattern found in autism and paranoia. Words and the concepts they represent are clearly mentalistic – particularly when the concept is a purely abstract one, like mentalism itself. And even when a word represents an object which we might rightly see as part of the physical world, the fact remains that the word representing it is an arbitrary mental construct imposed by linguistic tradition and mentalistic to that extent. Indeed, paranoiacs like Schreber are often given to coining neologisms, and his book is embellished with many elaborate pieces of inventive phraseology and word-elision whose precise meaning is wholly Schreberian.

Hearing voices is another classic symptom epitomized by Schreber, whose verbal mentalistic sensitivity was such that he could discern that souls in general and God in particular spoke the 'basic language', a vigorous if somewhat antiquated German, characterized by its great wealth of euphemisms (Freud, 1911:23). Autism, by contrast, is hypo-mentalistic in this respect also because a linguistic deficit is typical of the disorder, and verbal communication skills are usually severely impaired.

Sex, autism and engineering

If there is indeed a continuum of mentalism, ranging from the hypo-mentalistic extreme represented by autism to the hyper-mentalistic one represented by paranoia, then recent research suggests that sex differences may also relate to it. Here the critical finding is that autism and the milder, less severe, Asperger's Syndrome which seems to share many of the same mentalistic deficits, are much more prevalent in males than females.

Although those who are diagnosed with autism and Asperger's Syndrome have deficits in language development, social ability and what I am calling mentalism, they are notably better than average at spatial tasks. This finding is important, not only because it suggests

that there may be pluses as well as minuses associated with hypo-mentalism, but because it ties in with what is already known about normal differences between the sexes where issues like language, social skills and spatial ability are concerned.

Here, studies suggest average female superiority in language skills; social judgement; empathy and co-operation; perceptual speed (finding matching items); fine-motor co-ordination; pretend play in childhood; and mathematical calculation. Male superiority is normally found in mathematical reasoning (especially geometry, logic: at the highest level male mathematicians outnumber female 13:1); embedded figure tasks; some (but not all) spatial skills; target-directed motor skills (irrespective of practice); navigation; and geography (boys always win the National Geography Bee, which tests children in grades four to eight on their knowledge of places around the world, and male college students can locate almost twice as many countries on an unlabelled map of the world as females can) (Baron-Cohen, 2002; Dabbs & Dabbs, 2000; Kimura, 2000).

From birth girls attend more to social stimuli, such as faces and voices than do boys, who have a preference to attend more to non-social, spatial stimuli, such as mobiles or traffic. Most girls develop language earlier than most boys, and normally girls develop social skills sooner than boys. However, babies with autism lack the innate preference for looking at faces rather than objects found normally in both sexes and shown, for example, in the readiness of older babies to return a smile. Here it may be significant that autistics process visual information about faces in the same part of the brain normally used for objects alone, rather than in the specialized face-recognition and reaction region found in normal people (Pierce, Muller, Ambrose, Allen, & Courchesne, 2001).

Asperger's Syndrome is sometimes called 'the engineer's disorder' and authorities in the field comment that

it is hard to find a clinical account of autism that does not involve the child being obsessed by some machine or another. Typical examples include extreme fascinations with electricity pylons, burglar alarms, vacuum cleaners, washing machines, video players, trains, planes and clocks. ... Showing an apparently precocious mechanical understanding, whilst being relatively oblivious to their listener's level of interest, suggests that their folk physics might be outstripping their folk psychology in development. (Baron-Cohen, 2000:75)

According to a recent survey of 919 families of children with autism or Asperger's Syndrome which listed occupations of parents, fathers of children with autism or Asperger's were twice as often employed in engineering as were fathers in any of four control groups of children with Tourette's or Down Syndrome. Another study of a mathematician, a physicist and a computer scientist all diagnosed with Asperger's tested them against controls on folk physics and folk psychology (Reading Eyes Test). Although all three equalled control subjects' performance on sex judgements on the eye test, all

scored more than one standard deviation below controls on folk psychology and more than one standard deviation above on folk physics (which is comparable to 85 per cent of Asperger's subjects, who also score at or above this level). As the researchers comment, 'These results strongly suggest that theory of mind (folk psychology) is independent of IQ, executive function and reasoning about the physical world ... and may therefore have its own unique evolutionary history.' They conclude,

There thus seems to be a small but statistically significant link between autism and engineering. ... The current result might also help to explain why a condition like autism persists in the gene pool: the very same genes that lead an individual to have a child with autism can lead to superior functioning in the domain of folk physics. Engineering and related folk physics skills have transformed the way in which our species lives, without question for the better. Indeed, without such skills, *Homo sapiens* would still be pre-industrial. (Baron-Cohen, Wheelwright, Stone, & Rutherford, 1999:475-83)

Astonishing evidence of the link between autism and engineering can be found in Silicon Valley (Santa Clara County, California). In 1993 there were 4,911 diagnosed cases of classic autism in Santa Clara County. In 1999 the figure passed 10,000, and in 2001 there were 15,441 cases, with new ones added at 7 per day, 85 per cent of them children. Given that employment in Silicon Valley is primarily in electronic engineering and computing, and that equal opportunity employment means that many children born there will have both parents in these industries, so-called *assortative mating* has been suggested as the most likely explanation. This is the idea that likes attract, and that people tend to marry partners who have much in common with themselves. In other words, it looks as if mentalistic deficits in people with engineering skills are being compounded in their children by inheritance of these deficits from both parents. There is certainly strong evidence that autism and Asperger's Syndrome are heritable disorders. For example, there is a 90 per cent chance an identical twin of a sufferer will also be diagnosed autistic. The risk of second child being autistic if one is already rises from 1-in-500 to 1-in-20, while the risk for a third being autistic after two children already are diagnosed is 1-in-3 (Silberman, 2001).

Mechanism

If gaze-monitoring and the attendant social sensitivities usually found most developed in females suggest an evolutionary origin for what I am calling mentalism, then the throwing, tool-using and fabricating skills associated with hunting suggest a parallel one for what we might call *mechanism*. In other words, if mentalism is a noun equivalent for 'theory of mind' or 'folk psychology', so mechanism as understood here would be an equivalent for 'theory of bodies' or 'folk physics' (Baron-Cohen, 1999).

The contrast between the false belief and false photo test is a telling illustration. Here the finding is that an autistic who sees an object moved without the knowledge of another person does not usually appreciate that other's ignorance of its new position – a clear Mentalistic deficit (indeed, one that has been called the acid test of theory of mind (Wimmer & Perner, 1983). However, an autistic who sees an object moved after they have photographed it usually predicts where it will appear in the resulting photograph correctly. This can be seen as a compensating mechanistic competence to the extent that it involves a correct understanding of the optics of photography (Baron-Cohen, 2000).

An additional virtue of looking at things this way is that it avoids stigmatizing autistics as simply deficient and instead balances their mentalistic deficits against compensating cognitive skills, suggesting that their apparent mental retardation in one dimension might open up precocious development in another. Ten per cent of autistics, but only one per cent with other developmental deficits, show so-called *savant skills*: in other words, outstanding cognitive and memory ability found among more prevalent disability. Such talents are usually limited to music, art, maths and calendar calculation, mechanical and spatial skills, often featuring astonishing memorization feats, while the combination of blindness, autism and musical genius is unusually frequent (Treffert, 2001). For example, a pair of identical twin savants described by Sacks possessed calendar-calculating skills over an 80,000 year range; could not do simple arithmetic, but would calculate lengthy primes for fun; could instantly count the number of matches that fell out of a box; and could remember the weather and the important political events on every day of their adult lives while having little or no memory of more personal events (Sacks, 1995).

W. D. Hamilton (1936-2000, the originator of modern, 'selfish gene' Darwinism) described himself as 'almost idiot savant' (Hamilton, 2001:xxvii) and rated himself 'fairly good at woodwork as at other handicrafts' to the extent of having carpentry as a 'reserve life plan' in case his theory proved unpublishable (Hamilton, 1996:26). Hamilton also conformed to the typical family of someone with autistic tendencies suggested above: his father was a well-known engineer (designer of the Callender-Hamilton bridge), and a geriatrician sister had engineering skills to the extent that she developed an improved pressure mattress for the treatment of bed sores (Bliss, 2001). Hamilton describes himself as possessing

notably a trait approaching to autism about what most regard as the higher attributes of our species ... a person who ... believes he understands the human species in many ways better than anyone and yet who manifestly doesn't understand in any practical way how the human world works – neither how he himself fits in and nor, it seems, the conventions.

He continues,

It is known now how autists, for all that they cannot do in the way of human relationships, detect better out of confusing minimal sketches on paper the true, physical 3-D objects an artist worked from, than do ordinary un-handicapped socialites ... so may some kinds of autists, unaffected by all the propaganda they have failed to hear, see further into the true shapes that underlie social phenomena. (Hamilton, 2001:xxvii-xxx)

The significance of these comments is that Hamilton's insights were almost exclusively into the fundamental *mechanisms* of evolution: natural and sexual selection, population genetics, and Mendelian inheritance. Furthermore, it is these very mechanisms which arouse most resistance in the general public when they are invoked as explanations, causes or foundations of human behaviour. Such invocations typically attract denunciation as 'reductionistic', 'deterministic', 'sexist', 'racist', and so on. But what most of such reactions share in common is their mentalistic bias: they are offended by the claims of evolutionary and genetic explanation because they appear to impugn mentalistic agency – the belief that, not only do we have minds, but that our minds and not our genes or evolved psychology determine our behaviour.

Scientific insights also appear to question mentalistic states – especially consciousness, the quintessence of mentalism – because here, as elsewhere with mentalistic subjectivity, the facts now strongly suggest that consciousness is very much the last part of the mind to become aware of what we are doing (Libet, 1985). And it is now an irrefutable fact that the vast majority of what goes on in our brains does so in total ignorance of our consciousness as such (LeDoux, 1996). This in turn casts doubt on the true nature of mental contents such as beliefs, emotions, and intentions, and generally makes mentalistic subjectivity seem worryingly different from objective, scientific knowledge of the mechanisms of the brain and mind.

Mental culture

According to the distinction I am suggesting here, biological science describes the evolved genetic, neurophysiological and psychological mechanisms underlying human thought, feeling and behaviour, while social and environmental factors determine the mentalistic subjectivity of human actors. What we may term mental – or non-material – culture can be seen to be both mentalistic in content and as arbitrary – or individually- or socially-determined – in nature. Indeed, we could list the mentalistic aspects of culture as follows:

! Etiquette, Social Conventions and Language

Although language has been rightly described as an instinct from the mechanistic, evolved point of view (Pinker, 1994), here language is understood merely as a collection of

arbitrary signs determined by cultural convention. And the same goes for etiquette: shaking hands or bowing, and eating with a fork rather than chop-sticks, are clearly also arbitrary, culturally-determined conventions (what sociologists like Émile Durkheim would have called ‘social facts’ (Durkheim, 1982) and later structuralist social scientists applying the linguistic analogy would regard as *signifiers* (Lévi-Strauss, 1969).

! Abstract and Conceptual art, Literature and Aesthetics

Recent research on the abstract art of Piet Mondrian (1872-1944) who claimed that elements of his compositions were critically placed for aesthetic effect suggest that, on the contrary, subjects (experts included) are unable to pick real Mondrians from others randomly generated by computer (Taylor, 2002). Much so-called ‘conceptual art’ appears to rely similarly on the mental attitude of the spectator more than it does on the intrinsic qualities of the object in question, and this is the reason I suggest that all such non-representational, non-realist art be regarded as essentially mentalistic.

The appreciation of literature relies fundamentally on mentalistic skills, and particularly on theory of mind to represent reality by purely representational and figurative means. Aesthetic values in general are highly subjective. Beauty notoriously lies in the eye – or perhaps we should say *mind* – of the beholder, and what one person regards as ‘artistic’ or aesthetically pleasing may just as easily seem ugly or prosaic to another. (For example, painted depictions of nudes are usually regarded as ‘art’, whereas photographic depictions of the same models could just as easily be seen as examples of erotica – or even pornography.)

! Religion, Superstition and Ethics

As I mentioned above, Schreber interpreted his delusions as religious and mystical insights into reality, and to the extent that all theological thinking presupposes the existence of supernatural beings and a ‘psychic’ or ‘spiritual’ dimension to the human mind, you could see it as similarly hyper-mentalistic. Indeed, such an approach readily suggests an intriguing new evolutionary insight into religion. According to this way of looking at it, theory of mind originally evolved to facilitate purely psychological interpersonal interactions in primeval societies. However, in the absence of the more mechanistic, scientific understanding of the physical world that was not to evolve until recently, existing mentalistic adaptations were applied to the universe as a whole, transferring concepts like agency, intention, culpability and prescience to deities, demons and supernatural entities of all kinds. As a result, reality as a whole – and not just social reality – became peopled with mental agents who could be influenced in ways analogous to those in which ordinary humans could be: through supplication (prayer), generosity (sacrifice), or contrition (penance). In this way, personal needs, failings and frustrations beyond the remedy of mere mortals could be redressed, and a mentalistic pre-adaptation set the scene for the evolution of religion, magic and superstition as independent cognitive systems.

Historically and socially, morality and religion are closely associated, and our routine tendency to name, blame and shame leaves little doubt that an ability to make and manipulate moral concepts such as justice, virtue and culpability are of enormous importance in our attempts to influence the behaviour of others by purely mental means (witness the frequency with which purely intellectual disagreements can lead to accusations of the ‘wickedness’ or ‘immorality’ of the view being criticized: (McKie & Thorpe, 2002).

! Law, Politics and Ideology

There is also a close affinity between ethics and law, particularly when the latter has a religious or scriptural basis as it does for example in Judaism or Islam. But all legal codes are mentalistic to the extent that they can – and typically do – lead to legal argument and contestation, for example in the conduct of trials. But you only have to compare this situation with that of laws as they are understood in natural science to see how different legal principles are from scientific ones. You could not, for example, advocate the repeal of the second law of thermodynamics in the way you might that of any human law, or dispute Mendelian inheritance in the same way that someone might challenge a will.

As for politics – at least in Western-style democracies – the adversarial nature of law finds an exact parallel in the similarly adversarial organization of political parties and legislatures into government and opposition, left as opposed to right wings of the political spectrum, conservatives versus progressives, and so on. Where ideology is concerned, no one will I think need to be convinced that the appeal of political ideologies lies in the arguments used to justify them, the emotions which they arouse, and in other mentalistic factors on which they rely, such as the personalities of political leaders or the beliefs of their followers. Indeed, and in so far as they are non-violent alternatives to more war-like social conflicts, you could see law, politics and ideology as the supreme cultural expression of mentalism as an evolved means of influencing others by psychological, rather than physical means.

Material culture

By contrast to mental culture, what might be termed material culture (the kinds of things studied by cultural anthropologists), reflects what I have called mechanistic cognition, rather than mentalism:

! Mathematics and Calendar Calculation

Even though systems of mathematical notation, and the base number for counting systems may vary culturally, mathematical principles, like Pythagoras’s theorem, or numbers like pi, remain true irrespective of culture or circumstance. And mathematical logic and numerical expression remain fundamental to mechanistic thinking wherever it is systematically applied in the sciences, technology or engineering.

Calendrical calculation is a particularly notable application in many cultures, and can often be embodied in objects characteristic of material culture such as written records, buildings, or religious artifacts. And as we have already seen, calendrical calculation is also a prime expertise of savants, many of whom are autistic.

! Representational and Utilitarian Art and Architecture

Savant syndrome can also be expressed in outstanding artistic talent, but here the output, be it drawing, painting, sculpture or modelling, is characteristically realistic, rather than abstract or conceptual. Indeed, this is often how savant's artistic skills are first recognized: even as children they show technical competence in representing things in their art that goes far beyond that normal for their age. To the extent that realistic art relies on objectivity rather than subjectivity it may be seen as mechanistic in the sense intended here rather than mentalistic.

In utilitarian art such as ceramics, joinery or glass-blowing, the link with technology and mechanical skill is self-evident, and in architecture the mechanistic basis is more evident still. Buildings are, after all, ultimately a question of engineering in whatever materials may be used, and although glass, wood, stone, brick and concrete remain the most common, today materials employed in more conventional engineering such as metal, plastics or composites are also increasingly used in architecture along with the engineering principles they make possible, such as cantilevers, pivots, tensioning and damping.

! Science, Technology and Engineering

Having already made the point about science, technology and engineering being the epitome of mechanistic as opposed to mentalistic cognition, I will not repeat it here except to add that, as applied to human behaviour, the result of such thinking is not simply hypo-mentalistic, but actually anti-mentalistic, as I suggested at the beginning. Its effect is to reduce human beings to the status of unthinking, biologically-determined robots without the many mentalistic attributes listed above which humans rightly think make them exceptional: etiquette, social conventions and language; abstract and conceptual art, literature and aesthetics; religion, superstition and ethics, law, politics and ideology.

Conclusion: the naturalistic and moralistic fallacies revisited

It is common to contrast *the naturalistic fallacy* — what exists is what ought to be, or facts should dictate values — with *the moralistic fallacy* — what ought to be is what exists, or values should dictate facts. However, the argument set out above suggests an intriguing new way of resolving the issue, and of doing justice to both sides of the argument about fact and value.

According to this way of looking at it, what is fallacious about both is their common over-

stepping of the boundaries between what I have termed mentalistic and mechanistic cognition. The moralistic fallacy mentalizes facts by confusing a purely psychological factor – moral evaluation, wholly justifiable in its proper, human context – with objective realities outside and beyond human subjectivity. It uses the mentalistic verb ‘ought’ in a context to which it does not apply. The naturalistic fallacy, conversely, objectifies mental, human subjectivity by treating it as if it were continuous with the natural world. To use the jargon of cognitive science, both erroneously portray domain-specific systems of representation as domain-general. But in reality values can only be applied to human subjectivity, and facts belong to the separate world of objective reality.

You could compare the mistake made by these fallacies with regard to the two modes of cognition which I have tried to distinguish here to someone expecting a spreadsheet program to play music on their computer, or an email program to produce graphics. No one today expects a single piece of software to be able to do everything you could do on a computer, and the same applies according to my argument to the human brain. Yet up until the present the assumption that has been generally made is that the human mind is equipped to comprehend any kind of reality using essentially the same basic cognitive skills and processes. While external influences on cognition in the form of political, social and economic biases were exhaustively catalogued in the nineteenth and twentieth centuries, the existence of internal, biological, brain-based biases was largely ignored. But as I have tried to argue, today the situation is quite different, and recent research into autism, theory of mind, and normal sex differences in cognition has transformed the situation entirely. Indeed, now it seems completely naive to think that there is only one mode of human cognition and just a single means by which people comprehend reality.

Consider a surgeon operating on a patient. The surgeon treats the patient as an unconscious, material object on which the surgery is performed, rather as a mechanic might approach a piece of machinery that needed fixing. (Here autistic tendencies would not matter, indeed, to the extent that they helped the surgeon be detached and objective in operating on a patient, they might actually be beneficial.) But in a clinical interview, the same surgeon would treat the same patient as a conscious subject, for example in negotiating a drug regime or post-operative care. In such contexts as this, the surgeon is obliged to respect the patient’s real freedom to choose, for example in agreeing or not agreeing to take medication or exercise in circumstances where, unlike the situation on the operating table, the surgeon does not have the power to enforce compliance on an unfeeling object. (And in such circumstances of persuasion mentalistic skills would definitely pay off, while autistic tendencies would be a serious handicap.) Clearly, both the mechanistic approach to surgery and the mentalistic one to the clinical interview are appropriate and correct, and no one would criticize a surgeon for either. On the contrary, a surgeon who insisted that the patient should be conscious and choose for themselves each and every procedure during surgery would probably have as few patients as one who treated patients in interviews as if they were inert, unconscious bodies on an operating table!

Much the same applies to mentalistic and mechanistic cognition. Each has its appropriate context. Essentially, what I have proposed is that values of an ethical, aesthetic, political, legal or religious kind have a proper place in mentalistic cognition, which is rightly applied in the humanities; is voluntaristic in its mode of explanation; relates peculiarly to psychological subjectivity; is the basis of mental culture; and is particularistic in the sense that mental life is individually- or socially-determined and culturally-relative. Material facts, on the other hand, relate to mechanistic cognition, which is properly applied in technology and the sciences; is deterministic in its mode of explanation; relates peculiarly to physical objectivity; is the basis of material culture; and is universalistic in the sense that scientific and technological truths are equally valid in all cultural contexts.

What I have tried to do here is to show that the fact/value problem is part of this much larger picture and finds new and unexpected insights in the study of autism and paranoia, as well as in normal sex differences in cognition. Essentially, I have argued that human cognition employs two distinct, non-commensurate and in many ways incompatible modes, each appropriate and reliable in its specific domain, but prone to fallacious or unreliable outputs if employed in the other. If I have succeeded in clarifying the differences between what I have termed mentalism and mechanism for want of better terms, I hope that I will have thereby contributed something – however small – to the avoidance of confusion between them in the future.

One virtue of this way of looking at things is that it would discourage religious, political and moral credulity, bigotry and fanaticism of all kinds by cutting mentalism down to size, so to speak. This is because all such reactions are quintessentially mentalistic, and according to this analysis, mentalism is just another human adaptation: the psychological equivalent of something like striding bipedalism, rather than some god-given, specially-created or necessarily-evolved spiritual superiority. (To use one of the few good analogies in another species, you might see mentalism as a means of communication and interaction as peculiar to our species and as quaint in its symbolism as the waggle-dance is to bees.)

Seeing culture as essentially mentalistic would also reduce literary and artistic snobbery and elitism, and would help to counter emotive, phobic and irrational reactions to scientific and technological innovation. Finally, understanding and accepting the mentalistic deficits of mechanistic thinking would also help to limit social exclusion, prejudice and misunderstanding of autistics of all kinds. Indeed, such a change in attitude might confer a new and special esteem on those who, like William Hamilton, have arguably contributed the most of lasting worth to our species as a whole through their work in engineering, technology, and science.

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