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1 Evolutionary Psychology: Evolutionary Psychiatry

1.1 Some assumptions of Evolutionary Psychology

1.1.1 Modularity

It is now typically accepted that there are a number of features that have traditionally been associated with modularity and that more or less of those features might be present to more or less of a degree for different cognitive or neurobiological structures / mechanisms. Some of the features of modules include informational encapsulation, localization, etc. We can talk of the contents / functions of the modules / mechanisms. Whether they are functioning correctly / representing or dysfunctioning / misrepresenting.

The interest in evolutionary functions as fixing function and dysfunction objectively (non-normatively) has been motivated by accounts that try and offer naturalistic explanations of mental content / representation. The idea is that mental content / representation can be fixed by mental functions / dysfunctions. If mental functions / dysfunctions are objective then we see how the naturalization works. An alternative to this kind of a line is a disjunctivist line that there aren't representations and misrepresentations rather there are just two different kinds of state. In virtue of what is something dysfunctioning rather than differently functioning?

1.1.2 Behavioral, cognitive, neuro-biological, genetic mapping

There has also been a growing realization that mapping different levels or layers of explanation is far from trivial. It was initially thought that the kinds of folk psychology (e.g., 'beliefs', 'desires' etc) would map fairly straightforwardly to

neurophysiological states. Or that behaviors (e.g., 'anger', 'key press') would be fairly straightforwardly mapped to neurophysiological states. Or that beliefs and desires would fairly straightforwardly map to behaviors (e.g., reports of beliefs would predict voting behavior). This has turned out not to be the case, however. Genes to morphology / behavior similarly problematic.

Insofar as the kinds from cognitive psychology will correlate to the kinds from neurophysiology we need to be revisionist about the kinds from one or other or both of those fields. Similarly, insofar as we want a classification system of behavioral symptoms (for instance) to be useful to researchers in the genetics of mental disorder, the neurophysiology of mental disorder etc we are going to need to be revisionist about the classification system.

The DSM purposely tried to classify on the basis of observable behavioral symptoms since there was so much disagreement in attempts to classify on the basis of theory-laden notions. While many have considered it to be a virtue that the DSM by way of focusing on observable behaviors and achieving relative consensus for the field… It has come under serious criticism for sticking to the observable behaviors and not at least attempting to classify on the basis of deeper essences. That which was most useful for consensus has been least useful with respect to theoretical development, scientific discovery, and (perhaps most worryingly) treatment.

While the DSM was supposed to unify and it did a relatively good job of it perhaps the time has come to move to the second stage of science – that of theory development. The National Institute of Mental Health has rejected the DSM as a useful classification system for the purposes of research. They have provided their own categories for research and these are intentionally supposed to cross-cut the DSM categories.

While the DSM provides a nosology where clinicians identify mental disorder on the basis of behavioural symptoms it would seem to be a separate issue whether mental disorders are constituted or defined by the behavioural symptoms as Behavioural

Kinds, however. If one takes the behavioural symptoms to be definitional or constituitive then there could plausibly be borderline cases where it is indeterminate whether the individual is in fact a member of the kind or not. It would seem, however, that the main reason why it is that certain properties are to be found clustered together in nature is because they share some underlying causal mechanism that are responsible for the properties homeostasis. It is because the causal mechanism is found in the different instances that we are able to make scientific generalisations and predictions. It could also turn out that the same set of behavioural symptoms could be generated in two quite different ways. If we found this to be the case then it would seem better to conclude that there are two distinct kinds of disorders where different interventions are required.

Thus, while we might typically identify or come to believe that instances are members of a certain category on the basis of superficial, observable properties, taxonomy is often revised as we come to define categories on the basis of the underlying causal mechanisms that are necessary for category membership. This is because causal mechanisms seem to be what leads to the properties homeostasis and the more homeostatic a property cluster the more those properties are able to support generalisations and predictions. While Boyd's view focused on internal generative mechanisms it is unclear whether a principled distinction between internal and external generative mechanisms can be sustained. If one views a species as an individual, for example, then lineage would be an internal property to the species. Boyd's homeostatic property cluster view, or something like it, can thus be thought of as consistent with both the essentialist and relational view of categories.

Wakefield attempts to draw a principled distinction between the 'right' and 'wrong' kind of causes for mental disorder. He maintains that when the harmful behaviours are due to inner malfunction the individual is mentally disordered and when the harmful behaviours are the result of external causal mechanisms the harmful behaviours are not indicative of mental disorder and are instead best thought of as a non-pathological problem in living. It would seem that whether mental disorders are

constituted by social causal mechanisms would be an empirical matter rather than one to be settled on intuitive grounds or by stipulation, however. Wakefield is especially focused on the notion of neurological and / or cognitive malfunction which he characterises along the lines of a hardware / software distinction and while he doesn't mention it I don't think he would be opposed to adding genetic malfunction to the mix (supposing that it makes sense to talk of genetic malfunction or kinds of genetic disorder). This way of thinking about inner malfunction seems very much in line with cognitive neuropsychology and it might be the case that the kinds of psychiatric disorder are derived as malfunctions of the causal mechanisms that is identified, at lest in part, by cognitive neuroscientists. Neurological kinds would seem to be fairly straightforwardly thought of as biological kinds. Some theorists have attempted to analyse Psychological kinds as another variety of biological kinds where mental or cognitive states such as belief and desire are the kind of state they are in virtue of what the mechanisms that support the state have evolved to do.

Sometimes theorists (like Wakefield) appeal to current functions instead of evolutionary functions where the effects of a current function are responsible for the mechanism being prevalent in current populations. Treating mental kinds as biological kinds is controversial, however. The natural categories or kinds would seem to be those of normal functions. Psychiatric kinds are breakdowns of normal symptoms and the breakdowns may be unified only by being breakdowns of a specific mechanism. There would thus seem to be an open ended class of ways things could go wrong. Attempting to list them all with respect to behavioural symptoms is thus bound to get unwieldy and more progress might be made by looking at different ways that normally functioning systems can break down.

> Judging from our experience in internal medicine it is a fair assumption that similar disease processes will produce identical symptom pictures, identical pathological anatomy and an identical aetiology. If, therefore, we possessed a comprehensive knowledge of any of these three fields - pathological

> anatomy, symptomatology, or aetiology - we would at once have a uniform and standard classification of mental diseases. A similar comprehensive knowledge of either of the other two fields would give us not just as uniform and standard classifications, but all of these classifications would exactly coincide.

Kraeplin, (1907) quoted in O. Reider (1974) 'The origin of our confusion about schizophrenia', \emph{Psychiatry,} 37: 197-208 from Bentall.

1.1.3 Dysfunctioning module

DISORDER VS PROBLEMS IN LIVING

Wakefield maintains that there is an important distinction to be drawn between mental disorders on the one hand and problems in living on the other. Wakefield maintains that an example of a problem in living is illiteracy where a person is illiterate because nobody ever taught them how to read. The idea here is that such a person isn't disordered because their illiteracy isn't caused by an inner dysfunction. Instead the cause of the illiteracy is their impoverished environment. In other words, behavioral symptom profiles alone are not enough to establish the presence from absence of disorder. Causes matter, and the presence of inner dysfunction (to behavior that is harmful to the organism and / or society) is required for disorder.

Another interesting case that has been raised is the idea of a person-environment mismatch. Murphy and Woolfolk (CHECK REF) consider an example of a smoke detector that is positioned too close to the stove. In this case the smoke detector gives off a number of false alarms and yet most people have the intuition that the smoke detector isn't malfunctioning (there isn't anything wrong with it) because the problem is rather that it has been positioned incorrectly. One suggestion of phobias or of certain triggers for anxiety is that they were adaptive to certain periods of our

evolutionary history and rather now we are in mismatched environments. For instance, having a startle response to loud noises would be adaptive in environments where loud noises reliably signaled dangers. Living in present day city environments repeated startle responses might result in significant problems due to high levels of stress / cortisol etc.

Most of the work in the philosophy of psychiatry has focused on attempts to offer a non-normative value-free foundation for the scientific aspect or critique that this is not possible. Relatively little work has focused on the normative or evaluative aspect of psychiatry. Are the norms that are relevant for bio-medical and mental disorder the same norms as those that are relevant for our (correct) judgments of social and / or moral deviance or are the norms importantly different? When are we justified in intervening to bring the individual in line with the norms rather than intervening to bring the norms in line with the behavior of the individual? Most of the work has focused on accounting for a non-normative, scientific aspect that converts normative violation into a genuine case of disorder. Not much work has focused on the normative aspect. Most of it has focused on the non-normative aspect. The idea seems to be that the same kinds of norms are operative and the bio-medical / mental disorder vs other kinds of normative violation are due to an additional factor that is present in the medical / mental case that is not present in the other cases. Namely, the presence of a dysfunction that is the cause of the norm violation.

Wakefield claims that the biological sciences have discovered that the relevant causal process for fixing function and dysfunction is evolution by natural selection. He claims that this is the relevant causal process not only for the biological sciences, but also for medicine and psychiatry. There is far from univocal support for the priority of evolutionary function and dysfunction for the biological sciences, however. A number of theorists have argued that a non-evolutionary notion is employed in at least some aspects of biology (See, for example Davies, 2000a, 2000b, 2001; Godfrey-Smith, 1993). Similarly, there is far from univocal support for the primacy of a biological notion of function and dysfunction for psychiatry. At

least some theorists have argued that the two-stage view presupposes an evaluative or otherwise normative aspect in the relevant notion of dysfunction (Megone, 1998, 2000).

While the *Diagnostic and Statistical Manual of Mental Disorders* presents a similar picture to Wakefield's in being two-stage and requiring dysfunction, the DSM presents a much more liberal view of dysfunction. The DSM regards the relevant dysfunction to be biological or psychological or behavioral. Wakefield argues that the relevant dysfunction cannot itself be behavioral, and instead the relevant dysfunction must be to a mechanism that is the cause of the behavior[1]. He maintains that to consider behavior to be functional or dysfunctional aside from how the behavior is caused is to fail to capture a distinction between "problems in living" and cases of genuine disorder[2]. His line of reasoning is as follows:

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[1] The notion of a mechanism is problematic. There has been controversy over whether evolution by natural selection is a mechanism, for example. Some have argued `no' because mechanisms need to be internal and localized - which seems to be how Wakefield is thinking of them. On the other hand, theorists have pointed out that paradigmatic mechanisms like neural states are spatio-temporally distributed and thus spatio-temporal distribution cannot count against evolution by natural selection. I want to put such issues aside for now and focus on the idea that Wakefield needs to do something to distinguish "disorders" from "problems in living". Indeed, this is the burden that two-stage theorists have chosen to bear.

[2] Wakefield is actually fairly liberal as to what sorts of things can be dysfunctioning mechanisms e.g., Component of them (genetic, cardiac, neurological etc) that is dysfunctioning. Wakefield's notion of a mechanism is fairly relaxed. He maintains that there can be relevant mechanisms on different levels of analysis. In the general medical case he considers mechanisms at the organ level and at the level of the cell. In the psychopathology case he considers mechanisms at the level of neurology and at the level of cognitive psychology. It is just that behavioral dysfunction isn't enough, it must be a component mechanism of a person.

Consider a person who is not able to read. Is the person suffering from a disorder? Reflecting on our concept we are led to the conclusion that whether or not the person is disordered depends on the cause of their inability to read. If we learn that the person has a dysfunctioning mental mechanism then we are correct to conclude that the person is suffering from a mental disorder. If we come to learn that their failure to read is due to nobody ever having tried to teach them then while we are correct in seeing that this person has very real problems in living, the person is not appropriately regarded as disordered.

Critics of the two-stage view maintain that all there is to mental disorder is "problems in living". This is just to say that we (normatively, evaluatively) judge the behavior to be problematic. Wakefield maintains that there is a distinct class of disorders that are caused by dysfunctioning mental mechanisms. Critics maintain that the notion of dysfunction cannot be cashed out so as to distinguish a genuinely disordered group (since there aren't any) from those suffering from "problems in living" which while a very real cause of suffering aren't disorders.

Wakefield and Szasz seem to agree that persons or persons behaviors cannot malfunction. Or that alternatively, there is no objective, non-evaluative notion of function / dysfunction of a person or a persons behavior.

Murphy seems correct to observe that Wakefield does seem to be capturing intuitions that we have about causes mattering. Some kinds of causes of behavior (e.g., play acting, co-opting the sick role to avoid duties and / or to gain attention etc) seem to be exclusion criterion for our regarding a person to be mentally disordered even if they display relevant behavioral symptoms. I will have more to say about causes later when I come to offer a characterization of the nature of the contribution from theoretic science. For now, let us turn to Wakefield's methodology that he uses in arriving at his conclusion that the relevant kind of dysfunction is *evolutionary.* Once I've laid out the view we are in the position to consider alternative accounts of dysfunction and we can assess which (if any) of

them seem to have prospects for distinguishing between “problems in living” that arise as the result of genuine disorder from those that don't.

Wakefield critiques the DSM view by being too liberal in maintaining that the relevant dysfunction can be biological, psychological, or behavioral. In particular, he maintains that behavioral dysfunction is insufficient for the dysfunction criterion. He provides the example of a person who is unable to read. They thus meet the DSM criteria for a reading disorder. If we find out that the person had received instruction that was comparable to other people and they had learned to read whereas this person had not then we would have the intuition that there was something wrong with this persons biological / cognitive mechanisms and they were dysfunctioning. If we learn that the person had not received adequate instruction, however, then even though this person might have the same behavioral presentation as the other person we would not have the intuition that the person was disordered, however. Wakefield uses this example to attempt to persuade us that behavioral symptoms are insufficient, and that the causes of the behavioral symptoms matter.

1.2 A shifting focus

1.1.4 Adaptive Plasticity

An alternative to modularity is plasticity. The idea of distributed coding / processing. The thought is that many of our higher cognitive capacities might turn out to be realized on a central processor that is plastic and it might only be relatively low level cognitive functions that are likely to be hardwired.

Sterelny draws our attention to the massive variation in our environment that makes hardwiring fairly unlikely for humans. He points to how our cognitive development is importantly scaffolded by tools and by learning. Insofar as we have hardwired

capacities they are more likely to be prosocial ones with respect to learning since we can't get by without that.

1.1.5 The accumulation of social capital

1.1.6 Minimal cognitive requirements

Health in physiological systems.

1.3 Health in ecological systems

\ Other things could be going on aside from dysfunction, though. Poorness of fit (operating outside designed range)

Much of the literature on the evolution of co-operation focuses on explaining how co-operation could be selected for (or at least tolerated well enough to not have been actively selected against) given the problem of free riding and the personal cost of policing that. In *The Evolved Apprentice* (2012) Sterelny shifts the focus from Machiavellian policing to that of mutual positive benefits of pro-sociality and co-operation. For example the mutual benefit of pleasure in joint attention and joint action where that pleasure is hard to fake and thus provides evidence for ones commitment to collaboration.

The accumulation of social capital depends on sophisticated knowledge of how to extract resources from our environment in various co-operative and high tech ways. The vast range of habitats, technologies, and co-operative strategies employed by humans suggest that particular methods are unlikely to be innate. This knowledge is not something that every individual could learn in their lifetime by trial and error learning. It is in virtue of our gregarious hyper-sociality that we have the high fidelity

oblique transmission of information and technical competencies to meet the performance specifications of our lifetime and contribute actively towards the accumulation of social capital.

Sterelny writes that we are obligate co-operators and that humans(?) have probably not been able to go it alone for the past 100,000 years or so[3]. Ones ability / willingness to participate in joint attention and the pleasure that one takes in joint action is hard to fake and might well be reliably predictive of whether one will engage in joint activity when it might seem to be in ones personal interests to skulk safely in the rear while the others are engaged in predator defense (for instance). It has often been thought that a certain level of emotionality is hardwired or innate and crucial for the development of pro-sociality and morality. Sterelny's focus seems to be on joint attention and joint activity accompanied with positive affect which is reinforcing rather than particular emotions (e.g., fear, shame), however.

From Simple Co-Ordination to Co-Operation

Sterelny points out that coordinated even if not co-operative defense is more likely to be effective than solitary defense. It seems fairly straightforward to think that if throwing a stone at a predator works somewhat well to scare it off then simple coordinated action of multiple people throwing stones would work somewhat better. We can imagine how throwing stones at predators is a fairly automatic self-defense fight response. When coordinated action is successful we can see how

[3] I'm not sure why you say this because I thought there were (some though perhaps somewhat rare) people who do shun society and go bush. Perhaps this is more of a phase state, though. E.g., people might go wander in the desert for 7 years or go off to hunt possums or fish – but the point is that they come back. Is your thought perhaps also that they rely on the accumulation of cognitive capital in order to be self sufficient?)

critters come to find it reinforcing / to take pleasure from it[4]. In this way we are more likely to engage in coordinated action next time.

Machiavellian concerns raise the issue that it would be safer to defect from stone throwing (where the predator might attack in the direction of a successful hit) and skulk round the back while reaping the benefits of others being engaged in coordinated defense. If one had the cognitive capacity to inhibit an automatic response of throwing stones then it would therefore seem wisest to do so. This does requires one to forgo the reward of joint activity, however, and would come at personal cost even if one was not risking punishment from other critters. Pleasure from joint activity could thus serve as a commitment mechanism. We could trust people who took pleasure from joint activity (and who expressed shame for defecting from it) because those emotions are hard to fake.

Sterelny considers that the vervet alarm call system is puzzling insofar as the benefits to the signaler seem unclear. While the form of the vocalization might be arbitrary perhaps it isn't arbitrary that a vocalization is made, however. Let us consider (a perhaps different) sort of alarm system that arises as part of automatic response of noise associated with preparing to fight or flight[5]. If different noises are involuntarily associated with fighting (a sort of automatic battle cry) and fleeing (a terrified scream, perhaps), then these noises would serve as indicators. But indicators of what? It indicates whether the critter making the noise has assessed the threat as being surmountable or insurmountable. It indicates what that critter is going to do in response to the threat. These two things are coupled for the critter. Insofar as one critter fairly automatically responds to another critters noises as it does to ones own it would fairly reliably predict what the critters will do. Perhaps vervet alarm calls are a bit like my swearing in English when I hit my hand with a hammer. The

[4] Pleasure is something that we find reinforcing but of course not all things that reinforce behavior are pleasurable.

[5] There is of course a freeze response, too, though perhaps unlikely to be accompanied by noise.

precise form of my vocalization might well be arbitrary (e.g., that I swear in English rather than German) but the fact that I swear might be automatic or inhibited only with difficulty).

If I'm a mature critter and the critter assessing the threat / making the fleeing noise is juvenile then the best course of action might be for me to inhibit fleeing and check out the level of threat for myself. I might easily overcome what is insurmountable to the juvenile. Thus there is a benefit from being able to inhibit an automatic response to a call. To take into account the characteristics / perspective of the signaler. To assess the trustworthiness of the signaler might be one way of putting it – though the issue here isn't one of intentional deception but perhaps rather or personal relevance.

From this scenario we might get the ability for critters to inhibit automatic response and respond to threat differently. If I am aware that the noise I make influences others actions then my assessment of threat can be different. It can be more prescriptive of what others should do / it can take into account the actions of others in assessing the degree of risk. For instance, if a threat is insurmountable by me but surmountable by us all and y'all are likely to come if I sound a battle cry then it could be advantageous to sound the battle cry. Maybe plausible insofar as territory defense is concerned. Or where fleeing is unlikely to grant much asylum e.g., because of pursuit.

Cheating vs Defection / Incapacity

Some individuals are incapacitated (of pleasure / activity of joint attention and / or of pleasure / activity of joint action. Of course there are other reinforcement mechanisms than pleasure but people do find pleasure intrinsically rewarding. When it comes to individuals who aren't participating in join activity of work we distinguish between 'won't' – which is punishable and 'can't' which is not. The very young and the very old may be incapacitated. The temporarily sick or injured. More permanent disability. Physically and mentally handicapped. Problem of detecting

the physically sick from those mimicking or pretending to be physically sick. The latter – mentally sick / criminal. We distinguish between mad and bad.

The incapacity can be tolerated with population sizes that can support greater division of labor. Some socially useful functions…

The preference for solitariness might be beneficial when foraging dispersed resources with low threat of predation or hunting small game requiring focused quiet to track. It would make a more robust community if different individuals had different strategies (e.g., preferring to be solitary or gregarious) or if the same individuals were capable of employing different strategies given environmental shift (e.g., seasonally or yearly or given changing conditions). Or maybe a bit of both for extra resilience (at the population level). If some individuals persist with solitary strategies no matter what the environment is up to and the group buffers them by providing food then the group can see when times have changed and solitary hunting is starting to pay off. Is it tolerance for free-riding when someone's work efforts don't pay off? Unlucky. Societies with social capital may benefit from investing even when there is risk.

The gregarious / solitary distinction here might be thought to be done of degree, however. Solitary indiviudals take pleasure in joint action, too, it is just that they do it less often? They take less pleasure in it? Find it stimulating and there is a finer line between pleasing stimulation and overwhelming overstimulation. **T**here could also important benefits (to society) of a fairly significant degree of solitariness and a-(even if not anti-) sociality. It would make sense to monitor these people more closely and trust them less.

While 'Quiet: the power of introverts in a world that can't stop talking (Cain, 2012)' made the New York Times best seller list the notions of 'introversion' and 'extroversion' have been problematic for personality psychology. Indeed, the notion of 'personality' is problematic for personality psychology and a number of theorists have drawn our attention to how environmental features are more predictive of

behavior than internal or intrinsic features of persons that have been suggested as candidates for personality types. Part of the problem of the notion of personality is the idea that personality is invariant across the lifespan and stable across environmental shift. One of the ideas of the distinction between introversion and extroversion is the idea that introverts get or recharge their energy from solitude whereas extroverts get or recharge their energy from social contact, however. Insofar as introversion / extroversion are credible constructs they might be thought to have at least something to do with pleasure from joint (vs solitary) activity.

If the notions of introversion / extroversion are problematic there is a (perhaps) more credible line of research on physiological arousal in response to stimulation. Some critters are more sensitive than others. It takes a stimulus with less magnitude to prompt a physiological response. It takes them longer to return to physiological baseline. People find people (eye contact in particular) to be physiologically stimulating / arousing. Infants vary in their sensitivity. There has been a lot of work on the role of the mother (in the first instance) regulating the physiological arousal levels of infants. The mother can help stimulate the infants physiological system – looking, smiling, giggling, laughing, tickling etc. The mother can help soothe or calm the infants physiological system – looking away, rocking, deep pressure touching etc. Responsive mothers are able to help the infants regulate their physiological systems within pleasant levels. Non-responsive mothers can be over or under-stimulating.

One line of research that might be more promising than introversion / extroversion is the idea of reactivity of nervous system with respect to physiological arousal. All kinds of critters seem to reliably vary on this. It is fairly invariant through lifespan (I think).

Not every individual is highly gregarious, of course. There are many who are incapacitated from participating in social activities of contributing to the accumulation of social capital. We allow that there are some defectors, of course. Those who are unwilling that populate the prisons (and perhaps some of them are unable – anti-social / psychopath / sociopath). Those who are unwilling (but aren't

quite so pro-active in violating the preferences of others) – the lazy / complacent, the narcissistic etc. Those who are unable / incapacitated. The very old. The very young. Those who are sick. In hospital. Those with mental illness.

(Check out the personality disorders stuff that has happened recently. Theorists are starting to think the narcissists and borderlines are morally objectionable loafers)

Instead of the problem being conceived of as one of why we would punish cheaters – at cost to ourself, the problem might be more of how we refrain from punishing anybody who gets between us and the object of our interest. Sterelny (I think rightly) points out that it is not always obvious who the bullies and the punishers are. Perhaps not so clear who the free riders / social loafers are either.

TOLERANCE. Refraining from killing things. Small children are cute (less likely to kill them). But behavioral inhibition can come from fear, too. Adaptive action is harder. Behavioural inhibition is a natural response to bullies (if the bullies are in fact more physically powerful).

The chimps show behavioral inhibition, surely? Is it more that they are unable to perform actions that require it (e.g., their inhibition is freeze rather than act).

As population size increases this enables the division of labor. Fire keeping has been suggested as one of the first.

The freeriders are the ones that have control of the institutions that are set up to punish free-riding. They get to label who the free-riders are. They get to say 'we aren't bullies we are punishing defection'. But when we wonder why they have an awful lot of stuff for that (how much money do they earn?) There can be a lot of papers etc… Busywork. Advisors etc. Gets lost in the number of people employed. Hide it in the organizational structure.

Responsibility / capacity / culpability

The malfunction assumption does for psyhicatry what the dysfunction assumption does for biology… sometimes true sometimes faluse sometimes don't know. Doesn't impugn dx.

What would the science of psyhciatary (evo psychiatry) look like without it?

In 'The Evolved Apprentice' Sterelny offers a scientifically informed account of the evolution of hominim congition in a way that does not draw heavily from cognitive psychology or neuroscience. Sterelny focuses on the wide range of environments hominims have occupied and how our environment is radically shifting. If we are persuaded by this then instead of focusing on the unfolding of largely innate or genetically determined mental modules we are primed to think of the mind as being fairly plastic. Sterelny further primes us by introducing the idea of 'performance specification' that is abstract enough to divert our attention to the precise neural implementation. This is a useful maneuver insofar as while the significant majority of us might meet the performance specification requirements there might be very little at the neural level (because of neural plasticity, for instance) that underlies these abilities. Either because of the present state of our knowledge, or more generally as a matter of principle.

What implications are there for evolutionary psychiatry and evolutionary medicine with this sort of approach to the role of evolution and science in explaining function and adaptedness?

One of them is the idea that performance specification is central. I really like this idea of performance specification. It is behaviorist enough to get us out of the head – where things are extremely murky. It is cognitivist enough to be behavior under a description and introduce an aspect of purposiveness or adaptedness. It seems a

very useful notion indeed with respect to capturing some mid-way point between the organism on the one hand, and the environment on the other.

The focus on our rapidly shifting environment gets us thinking about adaptedness as being something that is a distinctive feature of us. Plasticity. Learning seems to play a bigger role for us than for other critters. Our lifespans are long. It does take time to learn. To become encultured. To adapt. But adapt we do.

7 years to expertise. Not that this is sufficient but that this is necessary for expertise.

Wakefield argues that pre-theoretically our notion of function:

> is a shared concept based on prototypical examples of non-accidentally beneficial effects like sight, and on the idea that some common underlying process must be responsible for such remarkable phenomena \cite[p.39]{Wakefield00}

While Wakefield thinks that a-priori God could have turned out to be the relevant process for fixing functions (as Paley thinks is obvious) it turned out as a matter of empirical fact that the relevant process for fixing functions is evolution by natural selection.

One thing that is interesting to consider here is why he thinks that teh god hypothesis is ruled out. Is it a matter of scale? Is it a matter of exclusiveness?

In his commentary on the first premiss Wakefield maintains that according to our pre-theoretic notions of `function' and `dysfunction' we are uncommitted to what it is that fixes the relevant functions and dysfunctions. He states that it is perfectly consistent with our pre-theoretic notion that the functions and dysfunctions are fixed by the intentions of an intelligent designer or by a creator God. Wakefield then employs a sub-argument to lead to the conclusion that the *historical* process that was responsible for certain traits or features being present in present populations that is the process that fixes the relevant functions, however. It seems to be to be far from clear that the *historical process* was the important feature of Paley's argument from design, however. It seems rather that the *obvious purposiveness* was the important feature. Some evolutionary accounts of function (propensity views) focus on the forward-looking aspects of evolution by natural selection rather than the causal-historical aspects in order to respect the teleological intuition and thus it is not clear how the pre-theoretic notion of function is essentially historical.

It is one thing to show the negative conclusion that the language of causes is incomplete. It is quite another to show the positive case that it is values, rather than some other Factor X, that is required to complete it (Fulford, 2000 p. 80-81) [he is contemplating Thorntons approach here].

1.4 Rethinking Evolutionary Accounts

Evolutionary accounts of mental disorder seem to have inherited some of the assumptions of Evolutionary Psychology. In particular, they assume modularity of mind. The focus is on dysfunctioning mental mechanisms. Wakefield is explicit in holding that environmental shift is not enough for mental disorder.

In 'The Evolved Apprentice' Sterelny considers an approach to the evolution of cognition that is more informed by ethology than cognitive psychology. He considers the task demands that our environments posed through evolutionary

history and is relatively agnostic about the cognitive or neurophysiological mechanisms underpinning these capacities.

What if anything can we take from this with respect to evolutionary psychiatry?

Sterelny focuses on how hominim environments are plastic. Because our environments are plastic we are required to be adaptable. If we view things in this way then instead of seeing a mech operating in a new environment to be dysfunctioning we can consider that the person is dysfunctioning insofar as they fail to adapt to their environment. Mismatch hypothesis.

This seems in keeping with a number of intuitions that we have around the diathesis-stress model.

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