

Mental Illness: A General and Specific Definition

20113

M.Sc. in Philosophy and Public Policy

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2014

Word Count: 9942

Abstract

In this paper, the author builds a general definition of mental illness from an objectivist view of bodily illness. Common objections to contemporary definitions of mental illness are dealt with, and it is further shown that only very limited assumptions about the mind are necessary to make use of the general definition. The definition is then shown to include a specific class of illness, Class-H illnesses, of which depression, addiction, and obsessive compulsive disorder are some, while excluding a historically troublesome non-illness, homosexuality. As such, it is suggested that the definition of mental illness created in this paper has the potential to be developed into a complete taxonomy of mental illness.

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I Introduction

The aim of this paper is to construct a general, objective definition of mental illness. I do not mean to prove that this definition is true, as that would require a classification of all mental illnesses and such a task is beyond this paper. Here I simply intend to construct a general definition and perform an initial test of its validity. In doing so, I will demonstrate that my definition avoids the common failings of contemporary definitions and that it could be developed into a complete taxonomy of mental illness such as the DSM-V.

It is important to understand the public policy concerns that drive this project. A significant factor is criminal and moral liability as, in certain cases, mental illness can lead to a person not being responsible for their actions. However, without a definition it is impossible to accurately apply the normative frameworks of law and ethics to cases of mental illness. A second motivation is that the ability to deliver effective treatment rests on an accurate understanding of illness. Such understanding is based in how we describe illness, and therefore defining mental illness contributes to our ability to treat mental illness. Finally, there is a driving social concern. Unlike all but a few bodily illnesses (namely AIDS), mental illness is highly stigmatised. Part of the reason is the lack of an objective definition, and the inability for people to subjectively understand what it would be like to live with mental illness. It is my hope that an objective definition would remove some of these obstacles to the fair treatment of those suffering from mental illness.

This paper will begin by giving a definition of bodily illness, focusing on biological structure and function. While the definition I give of bodily illness is not unproblematic, it will be sufficient to sustain the argument that follows. I will

then begin to address the issue of normativity and illness. Next, I will discuss the problems with applying the definition of bodily illness to the mind. I will suggest that we only need very basic assumptions about the mind to understand mental illness. Following this, I will discuss the dominant definition of mental illness, psychological realism, and the reason for its failure. This will lead to the issue of perceiving deviations in the brain, and how the structure of the brain precludes such perception. Finally, this will give us a general definition of mental illness. Before applying the definition, I return to issues of normativity, as well as describe what we must know about the mind to apply the definition.

At this point, I will apply the general definition to major depression. I will show that the general definition appears to highlight an important biological function that has malfunctioned in depression. This malfunction leads to defining a specific class of mental illnesses, Class-H illnesses. I will show that this class also includes a number of other illnesses, like obsessive compulsive disorder and addiction. As such, the specific definition functions suggests that the general definition includes mental illnesses. Finally, it is necessary to show that the general definition excludes non-illnesses. I will show that it cannot include homosexuality, which other definitions of mental illness have failed to exclude. In doing so, I demonstrate that the general definition likely excludes non-illnesses. This suggests that the definition of mental illness I give is promising and should be further developed.

II Bodily Illness

To approach mental illness from the view of psychiatry or philosophy of mind would be to take our concept of the mind as our starting point. However, I want to avoid the historicity of these fields in building a definition of mental illness. As such, I will begin with the other natural starting point for a discussion about mental illness: the concept of illness. The result of this is that this paper argues for the medical model of psychiatry. The medical model, put simply, argues that mental illnesses are also bodily illnesses (Guze, 1992). While this is not a particularly controversial view, neither has it led to an agreed upon definition of mental illness. I aim to demonstrate that a particular definition of mental illness is the logical consequence of the medical model of psychiatry and that, on first examination, the definition works well.

The two main views of bodily illness are the objectivist and constructivist views. The objectivist view is composed of two parts. First, it claims that the body is made up of some number of parts, each of which has a function and can therefore malfunction. Second, illness occurs if the malfunction of one of these parts is detrimental (Boorse, 1997). The first part is a claim that that functions of parts of the body can be objectively known. The second part is generally accepted to be based on a normative claim of what is detrimental. The constructivist objects to the idea in the first part that biological function can be determined objectively. Much has been written about this debate and I will not review it here.¹ As it is the basis of the medical model, my argument is built on the objectivist view. However, the constructivist view suggests a strong critique of contemporary definitions of

¹For a more in depth summary, see Kitcher (1997, Chp. 2)

mental illness and I will return to it later on (see pg. 14).

The objectivist definition of bodily illness I will use, adapted from Pickard (2009, pg. 84), is as follows.

Definition 1. *Bodily Illness is a significant deviation in normal biological structure and function.*

This definition includes the requisite objective and normative components. The objective portion is ‘biological structure and function,’ and there is reasonable question regarding the necessity of including both ‘structure’ and ‘function.’ In biology, as in arguably almost any functional system, structure and function are inexorably linked. It is often said of proteins, which are the basic machinery of life, that ‘function follows form’ since their proper functioning is based on their achieving the proper 3D structure (Kosak & Groudine, 2004). When they do not achieve the proper structure, the function of the proteins can be severely impeded or even become harmful, such as the amyloid plaques implicated in Alzheimer’s Disease (Hardy & Higgins, 1992). This relation holds true for the functions of chemical systems up through organ systems. In theory, then, the definition could be given just in terms of either structure or function. In practice, however, the link between these two is not always clear and so to emphasise that a deviation may be observed in only one even though both are necessarily involved, both structure and function are mentioned. The term ‘biological’ refers to an organism or a part of an organism. The phrase ‘significant deviation in normal’ is the normative portion of the definition. Most definitions of illness refer to the negative impact of an illness on an organism. However, I want to avoid the term bad for reasons I will make clear later on when discussing the stigma of mental illness (see pg. 19).

Fundamental to the definition of bodily illness is the notion of biological function and malfunction. The definition of function that I will use is:

Definition 2. *Function is a causal role that a given subsystem plays within a system.*

Function is a disputed topic in philosophy, but before I make a case for this definition, it is worth making clear what it means. ‘Subsystem’ refers to a part of the system that is studied. For illness, the system is the organism and subsystem is some part of the the organism, ranging from biochemicals to organ systems. In the case of mental illness, the system is a person and the subsystem is the mind or some portion of the mind. A ‘causal role’ means that the subsystem has inputs and turns them into outputs. It should be clear that the definition of function allows for nesting of subsystems and causal roles. The enzyme glycogen phosphorylase has the causal role of breaking down glycogen to glucose, but that enzyme is a part of neuromuscular system that powers muscles (Berk, 2012). Both the enzyme and the neuromuscular system can be considered subsystems with functions within a person, while the enzyme can also be considered a subsystem within the neuromuscular system.

While I have not yet defined normal function, and therefore deviation from normal, it is first necessary to address the philosophical issues surrounding function. The definition I present is what may be called a Cummin’s, or causal, definition (Godfrey-Smith, 1993). Such definitions relate to the causal role of a part within a system. The other important type of function definitions are Wright’s, or evolutionary, definitions. These definitions claim that something exists because it has the function, and that the function occurs because the thing exists (Wright,

1976, pg. 81). Evolutionary explanations have the appeal, and problem, of relating a function to an organism's fitness and ability to survive. The term fitness has its own philosophical problems (see Ramsey and Pence (2013)) but I will satisfy myself here with demonstrating some *prima facie* problems with a general evolutionary definition of function with regards to illness.

Consider the cases of sickle cell trait and homosexuality. Sickle cell trait confers significant protection against malaria, but is also associated with negative outcomes for individuals and very negative outcomes for any child of two afflicted individuals that is born with sickle cell anaemia (Ajayi, 2005; Ferreira et al., 2011; Williams et al., 2005). It seems, then, that under an evolutionary definition of function, sickle cell trait is a disease *unless* the individual lives in an area where malaria is endemic and treatment for malaria is unavailable. This seems like an absurd result. Under a causal definition, though, it seems straight forward to classify sickle cell trait as an illness based on its negative outcomes, while also acknowledging that it causes a gain in malaria resistance.

Further, The evolutionary definition runs into significant epistemic issues. While we shall see that causal definitions can function with incomplete knowledge, evolutionary definitions require complete information to make a determination of illness. Homosexuality, for example, could theoretically confer a disadvantage on species by reducing the breeding population. Therefore, an evolutionary definition would view it as an illness. However, if it was then discovered that the presence of homosexuality increased cooperation, and therefore fitness, of a species, it would not be considered a disease anymore. It should be clear that this would mean in many cases we cannot be sure if things we view as diseases are actually diseases. Both of these cases demonstrate unacceptable results, and while they could likely

be dealt with, I will be using a causal definition of function. While not immune to objections, it is *prima facie* more functional with regards to illness.

Now, the definition of function does not mention normal, and so it does not provide enough information to determine if a state is a deviation from a normal function. We therefore need a definition of normal function.

Definition 3. Normal Function *is a causal role that a given subsystem plays within a standard system.*

As would be expected from the word normal, this definition introduces a normative term. The normative term is ‘standard’ and I will not rigorously define it here for two reasons. One, while it is a normative claim and people are likely to disagree about it, I suspect that the disagreement will not drastically change what systems are actually considered ‘standard’. Second, the idea of standard may well depend on the system in question. If we are considering ability to see colour, the standard would be the range of the electro-magnetic spectrum that most people can perceive. This is different from that of a bone, of which the standard would be unbroken and not brittle. For the purposes of this paper, I believe that a common sense idea of standard will suffice.² It is therefore possible to understand the phrase ‘normal biological structure and function’ in the definition of bodily illness. As I do not wish to delve into the objectivist-constructivist debate, I am taking the objectivist portion for granted, and the idea of ‘normal’ simply links to ‘standard’, which I have discussed.

Finally, the normative issue of ‘significant deviation’ must be addressed. On

²It is my guess that this would be accurately represented by viewing the ‘standard’ system as being the mean or median of the distribution of some measure of a population that accurately represents the function in question. However, such a view is not necessary for my argument.

the most basic interpretation of this phrase, ‘significant deviation from a function’ means such a large deviation that either the original function does not occur, a completely new function occurs, or both. Now, this explanation is not airtight. There are two appealing ways to make the phrase ‘significant deviation’ more exact. The first is to appeal to the statistical framework I mentioned in regards to the term ‘standard’ (see note 2). If the term ‘standard’ refers to the average of a distribution, it would seem logical that ‘significant deviation’ would refer to the amount of distance from the average that constituted some percentage of the population that fell on the very edge of the distribution. This does not deal with the normative question of what percentage of the population this would be, but we could simply use arbitrary definitions of significance provided by statistics and ignore the question. This seems like a poor result. The next option is the relationship between significant and bad.

While I have avoided notions of bad up until this point, its relation to our common sense notion of illness is fundamental and must be dealt with. Normally, illness is thought of as being a state that is bad for the individual (Guze, 1992). The definition I have provided does not seem to deal with this issue of detriment. While the idea of ‘significance’ is normative, it is not generally related to the notion of badness. In health, however, ‘significance’ and ‘bad’ are tied together. In fact, one term can often be used as a proxy for the other.

The reason for this relationship is the link between biological structure and function. A significant deviation in structure makes the structure unable to perform the function. If the function is in some way important to the organism, which almost all traits are due to the removal of unnecessary traits during evolution, the loss of this function will have a negative impact (Berk, 2012). While this

is most obvious for very well defined subsystems, such as individual proteins, this holds true of general systems too.³ In health, the relationship between significant and bad is general and as such allows them to be used somewhat interchangeably. However, just because they can be used interchangeably is not a positive argument for using one term or the other. The reason I use significant in this paper is not based on its utility in describing bodily illness. Rather, I think ‘significant’ has an important impact on how we conceive of mental illness. I will discuss this later when I present my definition of mental illness (see pg. 19), but I will first turn to the issue of applying a definition of bodily illness to the mind.

III From Body to Mind

I have now outlined the notion of illness in enough detail for it to be applied to the mind, as the medical model of psychiatry suggests is necessary. We are, however, faced with one of the longest standing issues in philosophy: the relationship between the body and the mind. The body is a biological system, and therefore a physical system as well. This physical nature allows us to describe the body in terms of systems and subsystems that have both structure and causal functions. In philosophy, though, there is a long tradition of questioning whether the mind is a physical system (Descartes, 2008). If the mind is not of the physical world, then the concept of mental illness would seem to be absurd.

There are two possible tacks at this point. The first is to take the strict view that only physical systems can be said to have an illness. In this sense, unless the mind is a word that we use to describe a particular physical system, then the term

³Consider significant deviations in heat regulation or in height, both of which lead to negative outcomes.

mental illness is a misnomer. Now, we might believe that mind is a description of a biological system, but it is hardly agreed upon. As such, the strict view will tie the existence of mental illness to to the exact nature of the mind. This seems to put a premature halt to the discussion of mental illness. The second view avoids this problem.

Definition 4. Representational View of Illness *An illness can be said to be of a system (i.e. a system is ill) if the state of that system always directly represents the state of a physical system, and that physical system is ill.*



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As any system can be considered a direct representation of itself, the representational view does not affect our concept of bodily illness. To show how it affects our view of mental illnesses, consider the condition necessary for mental

illness not to exist. The condition that must hold for mental illness to not exist under the representational view of illness is that the mind cannot be a representation of a part of the body. This is violated if the mind has a causal relationship with the body, is correlated with the body, or is part of the body. The latter is the direct result of monism, the view that the mind is of the same substance of the body, while the former two cases are represented by different types of dualism, interactionism or epiphenomenalism and parallelism, respectively (H. Robinson, 2012). It is, in fact, difficult to see how the mind would not have one of these three relationships to the body unless the body does not exist at all, I view I shall ignore.⁴

As such, if we want to discuss mental illness without an exact understanding of the nature of the mind, the representational view seems to provide a useful starting point. It means that since the mind represents a part of the body (the brain), then if we observe changes in mental states there have been changes in the brain. Further, if there is a deviation in a biological function that relates to a mental function, the deviation in the mental function will be observable. This leads to two approaches. One is to try to define deviations from mental function. The second is to define mental and biological function and then predict deviations. I will attempt the latter, but first we will examine the failure of the former, as it is the basis of the most common contemporary definition of mental illness.

Psychological realism classifies mental disorder based on the symptoms displayed, symptoms that generally violate moral, social or epistemic norms (Broome

⁴It should be obvious that if the body does not exist at all, the definition of illness I have used is fundamentally flawed. However, it may be amended to require a deviation in an ‘imagined biological function’ which would make it consistent with the imagined body and also probably lead to the concept of mental illness.

& Bortolotti, 2009). Psychological realism accepts that disorders are rooted in biology, but states that they should be described based on the observed mental deviations. In essence, psychological realism classifies mental illnesses based on the symptoms not on the functions. This is the dominant way of defining mental illness, appearing most notably in the DSM-V (American Psychiatric Association, 2013a).

The DSM-V has been widely criticised for its practical failures (Gornall, 2013). Yet it also does not pass theoretical muster. The definition it uses, and the view of psychological realism, fundamentally mistakes “medicine with morals” (Szasz, 1974, p. x.). Now, Szasz (1974) is criticising the whole concept of mental illness, an issue I will deal with in the next section, but his point holds in reference to psychological realism. Its fatal flaw is that it has no principled way of separating the non-biological deviations from moral and social norms from the biological deviations that cause deviations from moral and social norms. This is, in fact, the central criticism that the constructivist view of illness makes, and it rings true for most definitions of mental illness. If illness can be objectively defined, then non-biological deviations are not mental illnesses and any definition of mental illness should make that clear. This point is made clear in Bingham and Banner (2014), where they use homosexuality as a test of the acceptability of definitions of mental illness. Their premise is that homosexuality is a deviation from a social norm, but is not an illness. As such, accurate definitions of mental illness should clearly exclude it from being considered one. They then demonstrate that the DSM-V, psychological realist definitions generally, and other contemporary definitions, fail (Bingham & Banner, 2014).

The failure of psychological realism is due to taking the symptoms of illnesses

as useful classifiers of illnesses. By giving symptoms so much explanatory power, the classification of an illness is separated from its definition: a deviation in function. The goal of the rest of this paper is to give a general definition of mental illness that is fundamentally linked to the concept of function.⁵ Providing such a definition is rather simple. However, definitions, and models, are only useful if they are shown to be valid. I will validate my definition in two steps. The first will be to show that the general definition can produce a useful sub-definition for a class of severe mental illnesses. I will take this as an indication that my general definition includes all actual mental illnesses. Second, I will demonstrate that the general definition excludes homosexuality from classification as a mental illness. I will take this as an indication that my general definition excludes non-illnesses. An absolute proof of my definition is beyond the scope of this paper, but I these two results are promising indicators of its validity.

IV The Structure of the Brain

It is worth considering Szasz's objection to conceiving of mental illnesses as illness. His point rests on observing structural changes in the brain. If illness is a deviation in structure and function, he believes the brain should show such a deviation. However, since we (often) do not observe structural deviations in the brains of people who are mentally ill, they cannot have an illness (Szasz, 1974). This is not an unreasonable point. If there were no structural deviations in the brain, then it would be hard to believe the brain was not functioning properly (considering

⁵Another major problem with the DSM-V is that illnesses show high comorbidity (Gornall, 2013). This would suggest that illnesses that are symptomatically very different have common functional deviations. As such, a definition of mental illness based on function would be expected to group these illnesses together whereas the DSM-V would not.

the close link between structure and function). Therefore, even if we thought the mental function of an individual was bizarre, the lack of brain malfunction would mean they are not ill.

Szasz's argument is logically correct. One of his implicit premises, though, is false. It is true that we often cannot observe deviations in brain structure. However, for Szasz's argument to hold, this must mean that there are not deviations in brain structure. Even if the former appears to hold true, the latter is not implied. To consider how this can be, it is useful to use the analogy of a computer. The structure of a computer can be described in different granularity. First, we might describe the general rectangular shape, with a lid that opens if it is a laptop. Next, we might open it up and describe the shapes of the visible parts. After that, we would probably turn to a microscope and start investigating the wiring and connections of the micro-boards. If we were really dedicated, we would want to probe the arrangement of electrons on the hard drive and the minuscule connections on the CPU, which would be challenging but doable.

Our understanding of the brain is around the second step. We know the general shape, and that certain large parts are related to certain functions, plus we know how to measure large changes in activity in those parts. However, to claim that we understand the structure of the brain in any deeply descriptive way is absurd. Imagine, as a layperson, trying to diagnose why your computer will not turn on. Unless you know it doesn't have a power source or has been dropped in a puddle, the best you can do is guess at possibilities. If you are a computer engineer, the problem is likely easy to discern because for computers it is *practically* possible to have a complete understanding of all of the causally relevant structures. On the other hand, it is not clear whether it is even *theoretically* possible to have a

complete causal understanding of the brain.

The reason for the possible impossibility of understanding the brain is due to its computational architecture. The brain is composed of about one hundred billion neurones, each connected to up to a thousand other neurones (Herculano-Houzel, 2012). It is generally accepted that a computation in the brain depends on the particular network of the neurones (Rumelhart, 1998). To predict how a computation will occur, and therefore understand the relationship between structure and function, we must know and understand the network of the brain. Yet the sheer number of neurones and their connections makes such a task daunting. With computers we can use microscopes, but is not currently possible to open up the human brain and map individual neurones. Further, due to perceptual limitations, is not unreasonable to think that it may never be possible (Bucher, 2014).

Such a result does not mean that structural deviation does not exist for mental illness, as Szasz suggests. Instead, we must reject Szasz's assumption that we have the capability to diagnose all relevant structural deviations. It is certainly likely we can diagnose some, such as when events (like a railroad spike) lead to the death of certain parts of the brain. The brain, though, is an immensely complex computational instrument packed into a very small space, and to assume that we can see all important structural deviations is foolish. This means that, like the psychological realist view, the definition I give is not dependant on noticing structural deviations but does assume such deviations occur.

V Mental Illness

Definition 5. *Mental Illness is a significant and continuing deviation in a basic mental function.*

The definition may not seem to directly flow from the definition of bodily illness, but the close relationship should become clear on examination. It is again useful to divide the definition into its normative and objective portions. The objective portion is ‘basic mental function’. In this context ‘basic’ is an important modifier of ‘mental function’. I take a ‘basic function’ to refer to a function that is not constructed from any other function of the relevant subsystem. A ‘basic mental function’ should map to brain functions, though this link may not always be clear based on our limited knowledge of the brain and mind. The link is a result of the mind being a representation of the brain.

To understand a basic function, consider a constructed (non-basic) function. Multiplication can be performed as iterations of addition and subtraction. This is, in fact, how humans seem to perform mental multiplication (Harel & Confrey, 1994). Therefore, multiplication is not a basic function. Addition and subtraction are not either, since they can be composed of counting functions. As such, not knowing addition or subtraction would not be considered a mental illness. Counting, however, is a basic function, as is learning. The inability to do either of these seems to constitute a mental illness (or disability). Counting and learning can be explained with simple processes in neural networks and can be plausibly viewed as based in biology, giving support to them being ‘basic mental functions’ (Rumelhart, 1998).

It is now worthwhile to address the normative aspect of the definition. I use

‘continual’ to distinguish actual structural changes from the highly noisy background of normal mental functioning. I will demonstrate why this is necessary, and how it works, later on (see pg. 23). Now, I return to the issue of why I have used the word ‘significant’ instead of ‘bad.’ Unlike most bodily illnesses, with the exceptions of HIV and some STIs, mental illness is highly stigmatised (Rüsch, Angermeyer & Corrigan, 2005). It is often viewed as wrong to have a mental illness, as if it is an individual’s fault that they are ill. Bodily illnesses do not have the same social consequences attached, and so labelling them bad is divorced from labelling an ill individual as bad. In mental illness, though, the definition used has significant social consequences. Since many mental illnesses impact in some way social functioning, if we label a functional deviation ‘bad’ it is an easy, if incorrect, mental jump to labelling the individual bad. Imagining this happening is simple.

Consider if you see someone dressed in very dramatic clothing. You could say either the person is dressed “weirdly” or that “not many people dress that way.” The first is a value judgment, and while you may be simply commenting on the person’s clothes, you probably think the person is weird, too. With the second statement, you may still think the person is weird, but since the statement is not a value judgment it limits the transferal of judgment from clothes to person. This is the goal of using the word significant. To prevent value judgment of a person based on a factor, illness, that should be irrelevant.

VI Mental Function

We now have a fully developed definition of mental illness. It is not immediately clear, though, how it leads to an understanding of mental illness, and if it cannot

do that it is useless. This, then, is our first task. We must figure out the illnesses the definition includes. The initial answer to this is that illnesses will be deviation in mental function. However, while we have defined function, we have not defined the mind. It therefore seems impossible to know what a mental function is. Now, I have no interest in defining the mind. To do so would require more space than I have available for this paper. Instead, I am going to define boundaries for what can be mental functions. I will not claim that the mind fills all the area within these boundaries, simply that it must be contained within them. This, I think, will provide enough clarity to make the general definition usable.

First, it is worth considering the space that basic mental functions inhabit. These are functions that have a biological description, and so they should be considered to be in the set of brain and mental functions. Non-basic mental functions are different. Consider having a conversation. The ability to converse can, I believe, be reasonably described as a mental function. However, it does not seem to inhabit the same space that basic brain and mental functions do. It is a constructed function, one that involves basic language function, memory functions, and social functions, among others. As such, constructed functions cannot be usefully described as individual biological functions. Therefore, deviations in constructed functions do not necessarily indicate mental illness.

Constructed functions, then, might be described as mental functions but not brain functions. Although constructed functions are biological they do not have a biological description or function. This is because from a biological view, the combined processes are not functionally distinct from numerous other combinations of brain processes. The only thing that labels a constructed function a function is our subjective interpretation of the function, Therefore it can be viewed as a mental

function, but not as a brain function. However, just as there are complex mental functions that are not usefully described as brain functions, there also seems to be brain functions that are not mental functions. A clear example of this is the autonomic nervous system, which automatically regulates such things as heart rate and breathing that are not consciously controlled. There also are functions that may or may not be considered to be mental, but are certainly brain functions. Memory, for example, could reasonably be considered just a brain function or could also be considered a mental function. The accurate description of these functions do not concern me overmuch. This is because a deviation in a brain function will be considered an illness even if there is debate over whether it also constitutes a mental illness.

The question of whether something is a constructed or basic function, however, is pressing. That determination can mean the difference between a deviation being a mental illness or not an illness at all. It is my belief, though, that the definition I have provided is robust enough to accurately divide the constructed from basic functions, even if this line cannot be clearly seen before the rules are applied. I will now attempt to apply this general definition to depression. Doing so will demonstrate how the general definition allows us to examine a potential mental illness and determine the normal function that it deviates from. The classification that I build is an indication that the general definition accurately selects actual mental illness from potential candidates, while the later examination of homosexuality shows the general definition excludes non-illnesses.

VII Working To a Specific Definition

There are two ways to produce a specific definition for a class of mental illnesses based on my general definition. Either you can start from deviation in function and examine how the deviation would manifest, or you can start with symptoms and work backwards until you have found a function. Generally, the first is preferable. It is the equivalent to having a model (the deviation in function) and then testing the model (by comparing the expected manifestation to actual manifestations of mental illness). However, to do this for all diseases would require knowledge of all basic mental functions. It strikes me as unlikely that we would *a priori* have such knowledge. We are left, then, with deriving function from suspected malfunction. This essentially means that we have added an extra step to our model building procedure.

When building a model, there are three general steps (Barlas & Carpenter, 1990; Ljung, 1998). First, derive potential model parameters from a data set. Second, build a model and test that on the initial data set. Finally, check the validity of the model by testing it on a new data set. By deriving function from symptoms, we have performed the first step. Checking a functional deviation against the original symptoms is the second step. Showing that the functional deviation explains, or predicts, other symptoms or conditions, is the third step. This can also be viewed as starting with phenomenology of an illness, determining a possible deviation in function, and then using that function to predict other real phenomenological experiences.

Consider the phenomenology of sadness, traumatic grief, and depression.⁶

⁶The phenomenological experiences of illness described in this paper are primarily based on symptoms described in the DSM-V (American Psychiatric Association, 2013a).

Sadness may be precipitated by the thought of a friend moving away. Such an emotion can be distracting but, in the absence of severe mental fatigue, is rarely enough to prevent an individual from working (Boksem, Meijman & Lorist, 2005). Further, the emotion can be overridden with minimal effort, such as watching a comedy. The emotion may impact your overall affect, but it is in no way dominant nor does it prevent other emotions from occurring. The emotional experience is very different if, instead, a close friend suddenly dies. Traumatic grief is related to sadness, but it is a different order of magnitude. Immediately after the loss, it is unlikely that you can avoid thinking about it or feeling grief. It is difficult to concentrate on any tasks that require concerted mental effort (L. Robinson, Smith & Segal, 2014). It may, however, be possible to distract yourself with mildly engaging yet repetitive tasks, such as sorting laundry, which suggests that the emotional response during grieving mimics mental fatigue (Kahneman, 1973). Unlike with sadness, it is not possible to moderate grief simply through happy affecting experiences like watching funny movies. While happiness can often override and dismiss sadness, grief may make a person unable to feel the happiness entirely. These symptoms, though, are temporary. Grief naturally fades and it becomes possible to focus on work and experience happiness.

Depression and traumatic grief can be difficult to tell apart, and this in turn can allow us to examine the phenomenology of depression by looking at traumatic grief (American Psychiatric Association, 2013b). However, it is important to distinguish the two, and the difference in how long each lasts drives the ‘continuous’ term in the definition of mental illness. Whereas grief is a temporary deviation, depression is a semi- to permanent deviation. The former should not be considered an illness, but the latter should be, and ‘continual’ allows this differentiation. It is

to be expected that mental function will vary widely, and that this noise will make it difficult to determine normal function from malfunction. The term ‘continual’ helps to differentiate the signal from the noise.

Let us now return to the symptoms of grief and depression and see if they suggest a functional deviation. A useful way to do this is comparing a normal manifestation, sadness, to the extreme manifestation, grief (which, if continually manifested, would be depression). Some differences are striking. Sadness can be overridden by other emotions, grief cannot. Sadness does not significantly prevent focus; grief does. Sadness occurs due to prompting (seeing a picture of your friend), grief reappears without prompting. These differences suggest that there is an unconscious process at work. In the case of sadness, it needs to be stimulated to appear, and it can be repressed. In the case of grief, it is constantly stimulated and is very difficult to repress.

There are a number of levels at which we can understand the differences I have described. Certain authors, such as Andreasen (1997), view molecular biology as the essential starting point of mental illness, while others such as Kandel (2008, Chp. 2) consider it to be information processing. It is my view that just as in bodily illness, mental malfunction can occur at many different levels and therefore different malfunctions require looking at different levels of function. Further, fundamental malfunctions may cause malfunctions at higher levels that can be observed and made use of first. Such is the case if an individual experiences extreme muscle weakness, a failure of the muscle system, linked to certain aspects of the diet. Fundamentally, this may be a malfunction of a molecular subsystem of the muscles, but it can usefully be understood and treated at a much more macro level, the diet. It is my feeling that mental illnesses should be approached the

same way.

For a given potential mental illness, it is worth taking the most broad view of functions and then increasing the level of granularity until a disease can be effectively understood and treated. While there is no upper limit on the level of precision used to understand a function (as more precision will simply lead to a more exact physical description), a lower limit is determined based on what can be considered a ‘basic mental function’. As such, mental illnesses, like bodily illnesses, may be first described at macro levels of function and then increasingly more fundamentally. The information processing capabilities of the brain are a basic part of our conception of mental function, and are also among the highest level of functions we conceive of as brain functions. As such, it seems like a good place to derive a functional description of a potential illness. Here, I will make use of Dual Systems theory, a view that has gained widespread acceptance since Kahneman and Tversky introduced it in the 1970s. I will discuss the theory based, unless otherwise noted, on Kahneman (2011) along with some of its implications, and then see if any basic functions it describes appear to malfunction in depression.

Dual Systems Theory states that humans have two different ways of processing information. System I, or Type I, processes are automatic and unconscious. They occur without effort and happen immediately. System II, or Type II, processes requires focus and attention. They are effortful and slow. Type I processes occur when you see a problem such as $2+2$. For such problems, you immediately know the answer, while Type II processes are involved when you calculate 17×19 (323). A powerful way to consider how these processes are combined to allow for our entire range of information processing is to view Type I as being the basic operations of information processing and Type II as the combination of those op-

erations. Consider multiplying out 17 and 19. This likely requires working the problem out on paper so as to decompose it into smaller problems for which you know the answer immediately. In other words, Type II processes allow you to focus on the problem and order Type I processes. You decompose the problem and then rebuild it from the basic parts that Type I processes can solve.

I am not suggesting that this view of the interaction and nature between Type I and Type II is canonical, but it is consistent with the main views in the literature and it will prove useful. As we can see, Type II processes are able to redirect Type I processes. This occurs when a Type I process is occurring and Type II process refocuses the mind. A good example of this is listening to the radio (language interpretation is a Type I process) and then focusing on the voice of your mother and listening to her. The redirection, or refocusing, takes mental effort. Type II processes are limited in their ability to refocus the mind when a person is mentally fatigued. If the only options to focus on require similar mental effort, such as listening to two different sources, Type II processes can generally refocus the mind. However, if one source requires sustained mental focus, such as complex multiplication, then mental exhaustion may prevent focusing on that source. Likewise, if a particular Type I processes is extremely strong, it may be generally impossible for Type II processes to refocus the mind as any other Type I process will require relatively extreme levels of focus. Strong Type I processes, then, mimic mental fatigue.

This discussion of the interaction between Type I and Type II processes echoes a number of the differences between normal sadness and traumatic grief. The symptoms of sadness seem to match the interaction I have described, where Type II process can generally override Type I processes. Grief, however, seems to

be a case where Type II process are consistently prevented from reassigning focus. Normally, Type II processes are able to determine focus. Occasionally extremely strong Type I processes occur that direct focus such that Type II processes have no ability to redirect it. A common example of this is the fight or flight response. When a perceived threat stimulates this response, all mental effort goes into dealing with the perceived threat and it is nearly impossible to refocus.

Such strong Type I process only last for a short while, though, and this makes sense in terms of information processing. It seems necessary that the brain must be open to receiving novel input by reassigning focus. This suggests that there is a general mental function that regulates the strength of Type I processes. It does not seem that this function can be constructed from others, so it is a basic function. While temporary strong responses due to external stimuli are acceptable, permanent deviations would not be. We can define the strength of Type I processes as activation level, and say that significant deviations from normal levels of activation are either (over) hyper- or (under) hypo-activation. This leads us to a definition for a class of illnesses.

VIII Class-H Illnesses

Definition 6. *Class-H Mental Illnesses are characterised by the continual, relative hyper- or hypo-activation of one or more Type I processes.*

Class-H illnesses fall within the of general definition of mental illnesses as regulation of activation is a basic function, hyper- or hypo-activation constitutes a significant deviation, and the definition includes a ‘continual’ clause. Relative is in reference to the normal level of activation for all Type I processes, not for

the individual processes that are involved in the mental illness. This clause is important to account for learned responses. A fear response to seeing a car after having been hit by a car is a reasonable response, but is not a normal level of activation for that Type I process. However, debilitating fear at seeing a car, such as a phobia, could reasonably be considered a mental illness, as it is relative hyper-activation. It might seem as if hypo-activation should always be considered an acceptable state, since we do not experience fear of cars generally, but the reality is that hypo-activation of the fear process would be if no fear were felt when a car posed an immediate threat.⁷ In such a case, hypo-activation is a distinct functional deviation and so is a key part of defining Class-H illnesses.

Class-H illness can be viewed as a consistent inability to either reassign focus *from* certain Type I processes (when they are hyper-activated) or *to* certain Type I processes (when they are hypo-activated). It is important to realise that short-term inability to reassign focus seems to be a natural and necessary part of brain functioning. A classic example of this is a strong fear response that makes it impossible to focus on anything but the stimulus of fear. Such a response strongly drives an individual away from the stimulus, which is likely a significant evolutionary advantage. However, a consistent deviation does not seem to pose any general benefit, and in fact is a functional deviation.

Both hyper- and hypo-activation are seen in depression, and are associated with important pathologies. The symptoms I described above for grief are characteristic of hyper-activation. Type I processes associated with negative emotions are hyper-activated in many cases of major depression, causing the overriding neg-

⁷Hypo-activation is when activating a Type I process is very difficult, not simply when a Type I process is not activated.

ative affect that characterises the condition. It should be clear how such hyper-activation makes focus nearly impossible, and severely disrupts work and social life. Hyper-activation is not the only failure of regulation seen in many cases of depression. Major depression is often also characterised by hypo-activation of a number of Type I processes. Some of these include positive emotions, which makes it harder to block out even weakly felt negative emotions⁸, but others are sensory processes which can cause the world to seem duller. In the most extreme examples depression causes large-scale hypo-activation. Instead of feeling very negative emotions, a person experiencing this type of hypo-activation experiences what might be inadequately described as a flat black and white world without emotions or feelings.

These views of hyper- and hypo-activation are supported not only by the phenomenology of depression, but also by a range of empirical data including neural imaging studies.⁹ It seems reasonable that activation of Type I processes, if occurring on a large enough scale, would be seen in imaging studies.¹⁰ Indeed a meta study of brain activation in depression suggests that areas associated with negative emotion are generally over-activated while those associated with positive emotions are under-activated (Fitzgerald, Laird, Maller & Daskalakis, 2008). In two other studies, it was shown that depressed patients show significant less activity in both visual and olfactory sensory circuits (Bubl, Kern, Ebert, Bach & van Elst, 2010; Negoias et al., 2010). In perhaps the best demonstration of

⁸Emotions appear to normally be among the highest activating Type I processes, making them difficult to override even when not hyper-activated (Evans & Stanovich, 2013)

⁹I would strongly urge you to see both Brosh (2011) for a compelling description of hyper-activation depression and Brosh (2013) for a description of hypo-activation depression

¹⁰While it is my suspicion that a given Type I processes could, in theory, be mapped directly to the individual activation of a specific network, we do not need to take such a strong stance. See Shapiro and Polger (2012) for such a view.

how depression prevents reassignment of focus, depression is associated with a depressed startle response, a result that would be expected with hyper-activation of emotional processes in combination with hypo-activation of sensory processes (Kaviani et al., 2004).

The functional deviation described by Class-H mental illnesses seems to be from a general function and as such we would expect to see other manifestations. A group I have mentioned in passing are phobias. Phobias do seem to be Class-H illnesses, as they are the consistent hyper-activation of fear responses under particular circumstances. Therefore, phobias are validly considered illnesses. However, it is important to note that not all illnesses require treatment. Necessity of treatment is a normative question, not dealt with here, based both on the presence of illness as well as the effect of the illness on the individual. Benign tumours are illnesses, but if they have limited negative effect on the individual they may be left untreated. That phobias are often left untreated should not cause denial of the fact that they are illnesses.

Phobias are often benign, but other Class-H illnesses are not. I will complete my discussion of this class of illnesses with a brief overview of two hyper-activation illnesses: obsessive-compulsive disorder and addiction. Obsessive-compulsive disorder (OCD) is characterised by compulsion to perform certain activities repeatedly. In general, the repetitive nature of obsession results from certain situations that arise constantly. The important part for the classification of OCD is that the compulsion is overriding. A compulsion, like a phobia, can accurately be described as hyper-activation of a Type I process in a specific context. This may be slightly more generalised, as in repeated hand washing after touching any sort of food, or very specific, such as touching the a door handle ten times before leaving a room.

The compulsion that presents in addiction, an overwhelming need to consume the target substance, differs in activation level based on context. If a person suffering from addiction is presented with the substance in an environment where they have taken it before, even though they have not consumed in a significant period of time, they will suffer hyper-activation of the relevant Type I process (Shiffman, 1991). Interestingly, unlike phobias or certain compulsions in OCD, activation of the involved Type I is not solely situational. Rather, addictive compulsion seems to be a constantly activated process that is hyper-activated in particular situations. Indeed, persons with addictions have increased tendencies to feel addictive compulsions when they are mentally exhausted or experience influences that depress general activation, such as drinking alcohol.

These examples of hyper-activation illnesses are presented for two reasons. First, it demonstrates that the definition for Class-H illness can explain more than just the data set it was constructed from (depression) and therefore has some level of validity. Second, both illnesses present important features that can be used to give more taxonomical detail.¹¹ Unlike depression, where the hyper-activation is of processes that cannot be ‘fulfilled’ in a meaningful way, compulsions are hyper-activated Type I processes that can be temporarily de-activated by the activation of other Type I processes. In OCD, hyper-activated processes are situational, not generally activated like depression. In addiction, the compulsion seems to be hyper-activated by situations but also seems to be omni-activated at lower levels.

I have now completed the first step in validating my general definition of mental illness, by demonstrating that it includes mental illnesses that are indeed

¹¹For a description of the good making features of a taxonomy of mental illness, see Kendell and Hudziak (2002)

illnesses. The next step is to show that my general definition of mental illness successfully excludes non-illnesses. To do this, I will show that homosexuality cannot be defined as an illness under my general definition.

IX Dealing with Non-Illnesses

The first step in seeing if a condition is an illness is to define the symptoms.

Definition 7. Homosexuality *is to be sexually attracted to one's own sex.*

Definition 8. Heterosexuality *is to be sexually attracted to the opposite sex.*

If homosexuality is to be an illness, than heterosexuality must represent normal function. Homosexuality is the attraction to the same sex. Now that we have a clear picture of the potential illness, we should check if it falls into any of the classes of illness already produced by the general definition. At the moment, that means checking if homosexuality is a Class-H illness.

Recall that Class-H illnesses requires *relative* hyper- or hypo-activation and not just activation of a process that is normally not activated. As such, while an individual who experienced hyper-activation of sex drive would be classified as mentally ill, simply being attracted to something that most people are not does not qualify as relative hyper- or hypo-activation. Therefore, homosexuality is not a Class-H illness. The next step is to determine if homosexuality is a malfunction of a basic mental function. To do this we will assume that it is, and attempt to derive the normal function. If we cannot find a function that is a basic mental function, we will have shown that homosexuality cannot be considered a mental illness under my general definition.

It is important to note a type of normal functioning that homosexuality does not violate. I mentioned earlier that an evolutionary view of function works poorly in the context of disease, but that does not mean that the reproductive potential of an individual is not an important causal function. Homosexuality, though, does not in a way preclude reproduction. If you are attracted to the same sex, you do not lose the ability to have sex with a member of the opposite sex. Under a causal definition of function, then, homosexuality cannot be considered a deviation in reproductive function (for the consideration of homosexuality under an evolutionary definition of function, see pg. 8).

The most appealing path to defining homosexuality as a deviation is to say that heterosexuality is a normal function. The concept of sexual attraction, if it is to be a basic mental function, cannot be important as a completely constructed social concept with no inherent biological function. If sexual attraction has a biological role, then, it is to link the physical act of sex to what is a normal sex-partner. It follows that the important properties of a 'normal' sex partner should be related to the physical act of sex. In fact, if the function is not socially constructed, the attraction should only be to the properties that a 'normal' sex partner has in relation to the act of sex (and, importantly, not the act of reproduction). It is not apparent, though, that there is anything intrinsically valuable about the physical nature of a heterosexual partner with regards to the act of sex. It should also be obvious that even the most heterosexual individuals find others attractive for socially constructed reasons, not simply physical reasons. Finally, it is difficult to see that if a sex act is the intended biological function, why a second individual is necessary at all. Such a view requires the assumption that sex is purely a reproductive act which for humans is simply not true. Therefore, there is

no way to define a ‘basic mental function’ that makes heterosexuality normal and homosexuality a deviation.

The reasoning above may appear somewhat convoluted. This is to be expected, however, since we were attempting the impossible task of defining a condition as a deviation from function when it was not. Indeed, there seems to be no way to view heterosexuality as normal, and homosexuality as abnormal, except in light of social norms.¹² It is a vital feature for a definition of mental illness to exclude non-illness, and I have demonstrated that my definition does this for homosexuality. Since most definitions of mental illness fail to exclude homosexuality except in an *ad hoc* manner, this is a promising sign.

A final note should be made about issue of morality and mental illness. In certain cases mental illness, such as when a paranoid schizophrenic is violent, can remove moral responsibility from a person. However, mental illness does not always relieve a person of moral responsibility (nor does it usually drive people to actions that are morally impermissible). On the flip side, just because an action results from normal mental functioning does not mean that it is morally permissible (such as acting on sexual urges without the other person’s consent). The point to be made is that morality and mental illness are two distinct issues. At times, considerations of mental illness may affect considerations of morality, but the issues at hand are fundamentally different and must be understood as such.

¹²It should be clear that similar reasoning will also show that paraphilias will not be considered as mental illnesses, as is consistent with contemporary philosophical thinking (Gert & Culver, 2009).

X Conclusion

An accurate account of mental illness is an essential healthcare and policy goal. Up until now, such an account has been elusive. In this paper I have demonstrated that a definition of mental illness can be constructed based on commonly held views about bodily illness and the mind, and that the definition appears to be valid. I began by discussing bodily illness, and how illness is defined. Next, I looked at the gap in understanding between the body and the mind, and how contemporary definitions of mental illness fall into this hole. This led to a discussion of the structure of the brain, and finally to a general definition of mental illness. This was followed by a discussion of mental function, which was necessary to apply the definition.

Showing that the general definition of mental illness was valid proceeded in two steps: showing that it included illnesses and that it excluded non-illnesses. In the first step, I applied the definition to major depression, which led to examining the phenomenology of sadness, grief and depression. In turn, the information processing of the brain was examined and led to the definition of Class-H illnesses. This class of mental illnesses was shown to include a number of other illnesses, such as obsessive compulsive disorder and addiction. As such, the general definition of mental illness appears to include actual illnesses. Finally, I demonstrated that the general definition of mental illness seems to exclude non-illness.

In this paper I developed a general, objective definition of mental illness and did an initial test of validity. The next step, then, is to further test the validity of the general definition. Such a project would be a large undertaking. However, as was demonstrated here, validity testing of definition produces definitions of classes

of illness. In other words, testing the validity of the definition would produce a classification scheme for mental illness. It is my view that such a classification scheme would be invaluable. It is high time for philosophy and psychiatry to move away from defining mental illness simply by symptoms and move to one based on function. My definition would produce such a taxonomy.

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