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When is development disordered? Developmental psychopathology and the harmful dysfunction analysis of mental disorder

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Abstract
One goal of developmental psychopathology is to understand the origins and course of mental disorders. I argue that pursuit of this goal requires a valid conceptual understanding of disorder and that this understanding can be provided by the "harmful dysfunction" analysis of the concept of disorder. The harmful dysfunction analysis holds that a disorder is a condition that is both harmful according to social values and caused by an internal dysfunction, that is, by a failure of an internal mechanism to perform a function for which it was naturally selected. This analysis explains why many of the distinctive features of developmental psychopathology are appropriate to the study of disorder. It is argued that the harmful dysfunction analysis is a necessary supplement to other proposed criteria for disorder, such as developmental deviation or predictive validity.

In a series of publications (e.g., Wakefield, 1992a, 1992b, 1993, in press-c), I have argued for a conception of disorder as "harmful dysfunction," where "harm" is judged according to social values and a "dysfunction" is the failure of an internal mental or physical mechanism to perform a function for which it was naturally selected. The harmful dysfunction analysis appears to have considerably more explanatory power than any proposed rival analysis (Wakefield, 1992a, 1992b, 1993, in press-c, in press-b, in press-f).

This article aims to introduce developmental psychopathologists to the harmful dysfunction analysis and to explore some of the conceptual links between the analysis and the field of developmental psychopathology. It will be argued that the analysis has value for developmental psychopathologists because it provides a needed framework for thinking about many of the thorny problems of classification of conditions as disorders or nondisorders that confront researchers in this field. The harmful dysfunction analysis is a useful supplement, it will be argued, to criteria for disorder suggested by some developmental psychopathologists, such as developmental deviation or predictive validity. I believe there is an affinity between the harmful dysfunction analysis of disorder and the methodological approaches to the study of disorder favored by developmental psychopathologists that can lead to a fruitful interaction between the two.

Rutter (1988) notes that developmental psychopathology involves three elements or perspectives: the developmental perspective, the psychopathologic perspective, and the focus on mechanisms, processes, and causal chains rather than sheer statistical associations and syndromes. In this article, I focus on explicating the relationship of the harmful dysfunction analysis to the psychopathologic perspective, although in the course of doing so I

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will also say something about the developmental and process–mechanism perspectives. The relationship of the harmful dysfunction analysis to the developmental perspective will be further examined in a forthcoming article (Wakefield, 1997).

Although the focus here is on clarifying the "psychopathology" dimension of developmental psychopathology, it should be emphasized that developmental psychopathology is about much more than psychopathology. Developmental psychopathologists are equally interested, for example, in the remarkable resilience that one finds in some children and adults who manage to retain their mental health despite extremely adverse circumstances (Cicchetti & Garmezy, 1993; Masten, Best, & Garmezy, 1990), and they study as well such topics as plasticity (Cicchetti & Tucker, 1994b), multiple pathways to adaptive and maladaptive developmental outcomes (Cicchetti & Rogosch, 1996; Sroufe, 1989), the complexity of person–environment interactions, the interplay between normal and abnormal development (Cicchetti, 1984; Cicchetti & Rogosch, 1996; Rutter, 1986; Sroufe, 1990), the continuity between disorder and nondisorder (Pennington & Ozonoff, 1991; Rutter & Garmezy, 1983), and normal development in general as it impacts on these many topics. However, as Sroufe and Rutter (1984) emphasize, much of the excitement about developmental psychopathology stems from the light its various insights ultimately shed on the development of disorder, and many of the other topics that fall within the discipline's domain are indirectly related to the interest in psychopathology. For example, such topics as resilience, plasticity, multiple pathways to given outcomes, interaction between and continuity between normality and abnormality, complexity of the person–environment interaction, and normal development are all of interest to developmental psychopathologists partly because of their implications either for understanding the nature and development of disorder or for understanding the pathways that lead to avoidance of disorder in challenging environments. So, despite the broad scope of developmental psychopathology, the psychopathologic perspective remains central to the field and its conceptual foundation.

The harmful dysfunction account of disorder is the result of a conceptual analysis in which proposed definitions are tested against common classificatory judgments in clear cases of disorder and nondisorder. The goal is to find the definition that best explains attributions of disorder and nondisorder. Conceptual analysis may seem a superfluous and alien methodology to some developmental psychopathology researchers, but in fact there is a similarity in the visions behind conceptual analysis and developmental psychopathology. Just as the developmental psychopathologist recognizes the complexity of underlying psychological structures that give rise to surface symptoms and painstakingly identifies the underlying structures to yield increased understanding of the symptoms, so, too, the conceptual analyst recognizes the complexity of underlying conceptual structures that give rise to surface distinctions in a discipline's assertions and painstakingly identifies the logical structure of the concepts to increase understanding of the surface distinctions and to resolve possible confusions about those distinctions. In both cases, a satisfying level of understanding is reached only after the process by which surface phenomena are generated from underlying structures is revealed.

Why Developmental Psychopathology Needs an Account of Disorder

One kind of impasse that can undermine the power and persuasiveness of a field's claims arises due to inadequacies in the conceptual foundations of the field. If the concepts that are used in constructing the field's basic assertions are ambiguous, confused, or unclear, then the coherence, integrity, and explanatory power of the field may be called into question. It is thus important to periodically take stock of the conceptual foundations of a developing field and, where needed, to adjust or supplement the field's conceptual underpinnings so that the field's research agenda can move ahead on a firm footing.

Such conceptual self-examination is especially important in the burgeoning field of developmental psychopathology because it is at the intersection of several traditional disciplines and is thus likely to face conceptual

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challenges in integrating their various concepts into a distinctive vision. Moreover, developmental psychopathology derives its power and appeal in part from its promise of explanatory clarity; the frustrating sense one often has when reading traditional psychopathology research reports that one does "not really understand what is going on" at the causal level dissipates when the developmental history of the disorder is laid bare, and the chronic concern that "something important is missing" from most traditional research reports is addressed by developmental psychopathology's aspiration to take into account the full complexity of disorder causation. A discipline that gains its appeal from its potential to offer especially lucid and satisfying explanations of disorder should be especially concerned that its explanations not be marred by conceptual limitations that undermine the clarity of the discipline's message.

One area in which developmental psychopathology may have an incomplete foundation is in regard to the concept of psychopathology (or alternatively "disorder," which I take here to be equivalent to "psychopathology"). Disorder is a highly contentious concept of which there are many competing accounts. Cicchetti (1993) observes that "the label developmental psychopathology denotes different meanings to different people and often is used inappropriately" (p. 472), and part of the reason for this confusion may be that different people interpret the meaning of "psychopathology" differently.

Rutter (1988) observes that the psychopathologic perspective is fundamental to developmental psychopathology and that research from this perspective "takes different definitions of normality and abnormality as the key variables that are crucial to the research strategies employed" (p. 487). The validity of such definitions is thus critical to the meaningfulness of research results, and validity depends on an understanding of the distinction between disorder and nondisorder. Given that developmental psychopathologists are centrally concerned to shed light on the genesis of disorder, the conceptual validity (i.e., the ability to discriminate disorder from nondisorder) of research criteria would seem to be essential to the field's integrity.

The need to delineate an adequate concept of disorder is not in conflict with developmental psychopathology's goal of openly exploring the continuities and discontinuities between disorder and nondisorder rather than imposing a rigid categorical structure beforehand that presupposes discontinuity (Quinton, Rutter, & Gulliver, 1990; Rutter, 1988; Rutter & Garmezy, 1983). Whatever continuities exist, there are many clear cases of disorder and nondisorder. To recognize continuities between disorder and nondisorder, one must know how to recognize clear cases of each. Moreover, it must never be forgotten that what appears to be continuity at the symptom level may turn out to be discontinuous at the mechanism level. As Kendell (1988) vividly puts it, "Continuous variation in symptoms must never be taken as evidence of continuity of underlying mechanisms. Huntington's chorea is transmitted by a single dominant gene, yet its psychiatric manifestations are extremely variable and indistinguishable from a variety of other syndromes" (p. 375). So, the search for continuities does not obviate the need for a clear criterion for disorder.

Lack of a valid concept of disorder is not just conceptually and methodologically problematic, it is potentially ethically problematic as well. Classification of a condition as disordered has ramifications ranging from those of "labeling" a child or adult as disordered to determinations of whether it is appropriate to treat the condition with drugs.

Many of the most intriguing and controversial issues in the field of developmental psychopathology involve the distinction between disorder and nondisorder, and any additional clarity about "disorder" might help us in grappling with such issues. Questions have been raised by both professionals and the public about when insecure attachment in childhood is a disorder, when rambunctious children should be considered to have a hyperactivity disorder, when disobedient children should be considered to have an oppositional–defiant disorder, when wayward children should be considered to have a conduct disorder, when children who do not learn should be considered to have a learning disorder, at what age an enuretic child should be considered to have a disorder, when delayed acquisition of lan-

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guage is a disorder, when extended periods of sadness is depressive disorder, and so on and on. It is incumbent upon a discipline that is grappling with these issues to give some attention to the criterion it uses to distinguish disorder from nondisorder.

Insufficiency of Developmental-Deviation and Predictive-Validity Criteria for Disorder

Before examining the harmful dysfunction analysis as a way of understanding disorder in a developmental context, it is important to consider attempts by developmental psychopathologists to link development and psychopathology together in a definition of disorder appropriate for the special needs and goals of the field of developmental psychopathology. The most common such definitional attempt proposes that *psychopathology is developmental deviation over time.* Allusions to an understanding of disorder as developmental deviation appear frequently in the developmental psychopathology literature. For example, Sroufe and Rutter (1984) note that in developmental psychopathology, "the focus is on pathology, that is, developmental deviations" (p. 18). Sroufe (1989) states, "Herein lies the major uniqueness of the developmental approach to psychopathology. Disorder is viewed as *developmental deviation*" (p. 13). Also, Sroufe (1990), in identifying "the essence of developmental psychopathology," notes that "psychopathology is defined as developmental deviation" (p. 335). Cicchetti (1993) says of the discipline: "From this developmental 'world view,' *any* psychopathology can be conceived as a distortion or deviation in the normal ontogenetic process" (pp. 474–475).

Of course, such claims may be interpreted in various ways, and the field's understanding of the relationship between psychopathology and developmental deviation is rapidly evolving; the above statements may not represent what most developmental psychopathologists currently believe, nor even the current considered judgments of the cited writers. However, for the sake of initially exploring the conceptual underpinnings of developmental psychopathology with respect to the concept of disorder, it is useful to take the above statements at face value as a starting point and to consider whether a definition of disorder as developmental deviation might be sufficient for the field's needs, thus rendering any further definition of disorder, such as the harmful dysfunction analysis, superfluous.

Note that the thesis that psychopathology is developmental deviation, at least as presented in the cited passages, is not proposed primarily as an open empirical claim to be evaluated by studying a large number of child and adult disorders, although the empirical route might also be pursued. Rather, in these passages, pathology is "defined as," "conceived as," "viewed as," or simply equated with failures in developmental ontogeny. In other words, the thesis appears to be offered primarily as a basic *conceptual* position on disorder that forms a distinctive framework for developmental–psychopathological research and theory. It is thus important to assess whether the thesis is conceptually adequate.

I believe that the thesis that disorder is developmental deviation, however valid it may be within a certain domain, is not sufficient by itself to meet the needs of the field of developmental psychopathology. Some further analysis of "disorder" is needed to form an adequate conceptual foundation for the field, for two main reasons.

The first reason is that the "developmental deviation" thesis does not allow one to escape from the problem of providing a further definition of mental disorder because the thesis begs the question of what is the relevant sense of "deviation." Deviation surely does not mean here "statistical deviation." Healthy developmental functioning can be statistically very deviant, especially if the individual is responding to a deviant environment. Indeed, extraordinary resilience that leads to a nondisordered outcome despite extremely traumatic environmental circumstances can be developmentally "deviant" in the statistical sense, but is not a disorder. Many conditions that deviate from social expectations, such as lack of vaccination or illiteracy, are "developmentally deviant" in the statistical sense but not in

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themselves disorders. Rutter (1988) notes that "disputes have raged over the differentiation of 'true' depression, a hypothesized disease state, from 'demoralization,' conceptualized as a normal response to stressful or adverse life circumstances" (p. 487), yet both depressive disorder and nondisordered demoralization due to unfortunate life circumstances represent statistical deviations from typical developmental pathways. Thus, deviation itself requires further elaboration and a nonstatistical definition if the "developmental deviation" thesis is to be an adequate account of disorder. It is not an answer to say that "deviant development" just means "disordered development," because then the definition is circular and we are back to the original question of the meaning of disorder. Some independent analysis of the kind of developmental deviance that constitutes psychopathology is needed here. The question is, what kind of developmental deviance constitutes a disorder?

The second reason is more controversial. Cicchetti and Toth (1991) admonish the field for an "incorrect, but unfortunately somewhat widely held conception, that developmental psychopathology is concerned only with conditions of childhood" (p. 49). However, Achenbach (1988) notes that "there are marked differences between children's disorders—which typically involve exaggerations of normal behavior or failures to develop important behaviors—and adult disorders—which more often involve marked declines from attained levels or the emergence of behavior that is clearly pathognomonic (i.e., indicative of pathology)" (p. 551). As the field of developmental psychopathology strives to transcend its roots in the study of childhood disorders and to encompass the study of the origins and course of all disorders, it is at least conceivable that some kinds of adult disorders may turn out not to be best understood specifically as developmental deviations. Just as in physical medicine, where disorders like infections and broken bones—although constituting deviations from normal adult functioning and therefore in a trivial sense being developmental deviations—are not most fruitfully conceptualized in conformance with a developmental model of disorder, it could conceivably turn out to be the case that some mental disorders cannot best be modeled developmentally in all cases. (Of course, it is likely that all mental disorders have developmental ramifications of one sort or another, but that is very different than the disorders themselves being best understood as developmental deviations.) The fact that it is conceivable for there to be such disorders suggests that some broader backup definition of disorder is needed to at least allow for the empirical possibility that not all disorders are developmental deviations, and that there must exist some concept of disorder more basic than developmental deviation. If there is, then defining disorder as developmental deviation could transform an important empirical question—namely, whether disorders are developmental deviations—into an empty tautology made true by definition. It would seem that a better and more persuasive course is to put forward the thesis that disorder is developmental deviation as an empirical thesis, and use a conceptually more basic definition of disorder as the criterion for judging whether the thesis is true.

In sum it is clear that not all developmental deviations—interpreting "deviation" statistically—are disorders, and it is possible that not all disorders can be understood as developmental deviations. Consequently, the developmental-deviation approach to disorder requires some further elaboration and constraints if it is to be valid.

If one accepts that the developmental deviation thesis needs supplementation, then there is a possible supplementary criterion that has been put forward by some developmental psychopathologists and that seems specially suited for developmental psychopathology's distinctive approach to disorder in terms of developmental processes over time, namely, the criterion of *predictive validity.* If one chose to emphasize the need for predictive validity as a criterion for disorder, one might claim that a developmental deviation is a disorder if it predicts later disorder. (I greatly simplify here for convenience of exposition; of course, the predictions could encompass maladaptiveness other than disorder.) However, although predictive validity is a crucial datum in many instances, one cannot rely on

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predictive validity to adequately resolve the general problem of defining disorder. The criterion that "a condition is a disorder if it predicts future disorder" is a classic case of infinite regress: How does one tell if a condition predicts future disorder, unless one has a criterion for disorder other than predictiveness? In any event, there can exist time-limited disorders that do not predict future disorders, and there can exist nondisordered conditions that predict future disorders. Predictive validity is part of a complex web of data that are relevant to assessing the disordered or nondisordered status of a condition, but in itself it does not have the logical power to be the needed basic criterion for disorder. (I consider the question of the appropriate role of predictive validity more fully below.)

Mental Disorder as Harmful Mental Dysfunction

The harmful dysfunction analysis of the concept of disorder has been presented, compared to alternatives, defended against critics, and applied to a variety of diagnostic issues in a long series of recent articles (Wakefield, 1992a, 1992b, 1993, 1994, 1995, 1996, in press-a, in press-b, in press-c, in press-e, in press-f, in press-g, in press-h). The analysis aims to capture the meaning of the concept of disorder as it is used both in physical medicine and in the mental health professions. As noted, the analysis appears to have greater explanatory power than any existing rival account. The analysis has been used to critique some current diagnostic practices, such as those based on DSM symptom-based diagnostic criteria (Wakefield, 1993, 1996, in press-e, in press-g, in press-h). In this section, I briefly recapitulate the analysis presented in earlier articles, but I focus here more heavily on the analogy between natural functions and artifact functions (Wakefield, 1992a) as a useful way of approaching the analysis. I limit myself here to presenting the analysis itself and do not summarize the various lines of argument that support the analysis; the supporting arguments, along with a much fuller explanation of the analysis, can be found in the cited publications.

The harmful dysfunction analysis of the concept of disorder starts from the common assertion that a disorder is a *dysfunction,* which is another way of saying that an individual has a disorder when something has gone wrong with the functioning of a mechanism inside the individual's body or mind; Klein (1978) calls such failures "part-dysfunctions" because they are failures of specific "parts" (i.e., mechanisms) of the body or mind. However, a dysfunction exists only when an internal mechanism is incapable of performing one of its *natural* functions; failures of "functions" that result from intentional uses by individuals or cultures of our natural mechanisms do not in themselves imply disorder. For example, the function of the nose in holding up eyeglasses has become a critical one in societies like ours that depend heavily on reading, but failure of the nose to perform this function is not considered a disorder; if one's nose has a shape or degree of slipperiness that makes holding up one's glasses difficult, that is not a nasal disorder because the nose was not naturally designed to hold up glasses. Similarly, we exploit heart sounds for the purpose of medical diagnosis, but where there exists a condition in which all other functional properties of the heart are normal but the heart sounds do not have the properties that allow for their use in medical diagnosis, this would be inconvenient, but it would not be a disorder because making sounds adequate for medical diagnosis is not one of the natural functions of the heart.

The notion of the function of a biological mechanism seems suspiciously teleological and, to be usable in a psychiatric context, must be analyzable in scientific, causal terms. The model to be used here for understanding biological functions is the notion of a function as used in describing the purposes of human artifacts, like pens, chairs, and automobiles, which have the functions of enabling one to write, enabling one to sit, and transporting one from place to place, respectively. Indeed, it seems possible that the concept of the function of a biological mechanism originally may have been derived by analogy from the concept of an artifact's function. In any event, the concept of the function of a naturally occur-

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ring biological mechanism may be considered an extension of certain aspects of the logic of the concept of artifact function to the natural realm. So, even though they are not literally the same concepts, understanding the logic of artifact functions is a way of getting an insight into the logic of natural functions.

Each artifact has many effects and many possible uses, so we might ask: What is it that characterizes the specific effect of an artifact that is considered its function? (I will use the singular for convenience of expression, even though many artifacts as well as biological mechanisms have more than one function.) The answer is that an artifact's function is a use or effect that was one of the reasons for the design, construction, and presence in our society of the artifact. That is, although the function is an effect of the artifact (e.g., being able to write is an effect of having a pen), it must be cited in a full explanation of the existence and structure of the artifact. One would not understand why the artifact exists or why it is constructed as it is unless one knew the function, because the function is the goal that people had in mind when designing and constructing the artifact. For example, one would not understand pens—why they exist and why they are constructed as they are—if one did not understand that pens have the function of enabling one to write. Another way of putting this point is that the function of an artifact is not merely an effect—not even just a useful or beneficial effect—because an artifact can accidentally have all sorts of beneficial effects, but the effect that constitutes its function is not accidental; the artifact is purposely *designed* to have the particular effect. So, the function of an artifact is what one might call an *explanatory effect,* that is, it is an effect of an artifact that itself must be cited in explaining why the artifact exists and has the structure that it does. Other effects of artifacts do not have this explanatory power; for example, the fact that a pen can usefully provide something to chew on when one is nervous or that a pen can be used as a pointed weapon does not at all explain why pens exist or why they are structured the way they are. Although pens have a shape that lends itself to nervous chewing and to defense, these uses do not in any way explain *why* pens have this shape; these uses are accidental side effects of the design of pens for writing, which is responsible for the shape of pens. Thus, these effects are not the functions of pens, even though they are beneficial effects of pens. It is only the effect of enabling one to write that explains the myriad details of why a pen is structured the way it is, so this effect alone is the function of a pen. So, to say that an effect is the function of an artifact is to offer a partial explanation of the nature and existence of the artifact in terms of the effect.

How can an effect, like a pen's effect of enabling one to write, be part of the explanation of the effect's cause, namely, the pen's existence and structure? This requirement seems to violate the principle that a cause comes before its effect. In the realm of artifacts, the answer is simple: The fact that a pen can write was represented in the mind of the designer of pens, and this mental representation of a desired effect guided the designer in constructing pens so that the structure of pens leads to the desired effect. The usefulness of pens for writing is thus not an accidental side effect of pen structure but actually part of the cause of pens and their structure, in the sense that a description of that effect must be cited in a full causal explanation of why pens exist and are structured the way they are. Of course, the effect does not literally cause its own cause, which would be impossible. Rather, as noted, a representation of the effect in the mind of the designer causes the cause, and there is no paradox in that.

The closest analogy in the realm of artifacts to the concept of a dysfunction of a biological mechanism is the concept of an artifact being broken or malfunctioning, so it is worth examining the notion of artifact malfunction in the light of the above analysis of artifact function. In the realm of artifacts, a malfunction is a failure of an artifact function, just as in the realm of natural mechanisms, a dysfunction is a failure of a natural function. For example, if a pen is too rounded to use for self-defense in a threatening situation, that is unfortunate, but it is not a malfunction of the pen. Or, if a pen is made of particularly unpleasant tasting plastic and thus is not very

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good for nervous chewing, that is undesirable, but it does not mean that the pen is broken or has anything wrong with it. It is only when something happens to the pen that interferes with the ability of the pen to perform the function it was designed to perform that we say that the pen is broken or malfunctioning. A malfunction of an artifact, then, is a failure of its ability to perform its designed function.

With this analysis of the concept of "function of an artifact" and the corresponding analysis of "malfunction" in mind, we can now turn to the harmful dysfunction analysis of disorder, which applies similar insights to the natural realm. Just as an artifact function is more than just a beneficial effect of an artifact, a natural function is more than just a beneficial effect of a naturally occurring internal mechanism. The language of function here as in the case of artifacts is used to indicate that certain effects of biological mechanisms are so complex, beneficial, and intricately tied to the mechanism's detailed structure that they cannot be accidental side effects of random causal processes but, like the intentionally designed functions of artifacts, must somehow be part of the *explanation* of why the underlying mechanisms exist and are structured the way they are. Thus, natural functions, like artifact functions, are explanatory effects. (By analogy with artifacts, such functions are often said metaphorically to be what the mechanism is "designed" to do or to be the mechanism's "purpose.") For example, just as it is no accident that one can write with pens and move from place to place in automobiles, it cannot be accidental that the eyes are structured so as to enable us to see and the legs to walk; the mechanisms that allow us to see and walk must be there in part *because* they provide these benefits, and this is why we consider these effects to be natural functions of the respective mechanisms.

The distinction between natural functions and other effects of a mechanism is drawn on the basis of this explanatory element. An assertion that an effect of a mechanism is useful does not offer any explanation of the mechanism; the usefulness could be due to chance. In contrast, function attributions implicitly make an explanatory claim, namely, that the mechanism is the way it is partly *because* of its usefulness. This is why, for example, pumping the blood is a function of the heart whereas making a sound in the chest, which is an effect of the heart that is useful for diagnosis, is not a function of the heart.

Dysfunctions, then, in the sense that implies disorder ("dysfunction" is used in many other ways, as well), are failures of mechanisms to perform their natural functions, where "natural function" is understood in the above "explanatory effect" sense. For example, the heart's failure to pump the blood is a disorder because it is a harmful dysfunction; it is a dysfunction because it is a failure of the heart to perform one of its natural functions; pumping is a natural function of the heart because it is clear from the nature of the mechanisms involved and the role of pumping in broader vital processes that the pumping cannot be an accidental by-product of having a heart but rather must somehow be part of the explanation of why the heart exists and how it is structured.

But, how can an effect (e.g., pumping, seeing) explain its own cause (the heart, the eyes)? In the case of artifacts the answer was that the effect was represented in the mind of the designer. What kind of process could yield analogous "design" characteristics in natural systems that came about without the actions of any designer?

To answer this question, we need a theory of how such explanatory effects can occur. Early accounts of this phenomenon included Aristotle's "final causes" and Aquinas's "God's intentions." Today, evolutionary theory provides the only plausible scientific account of how the natural functions of a mechanism can explain the existence and structure of the mechanism itself. According to evolutionary theory, some effects of a mechanism were beneficial to past organisms and thereby caused the natural selection of the mechanism. Consequently, those past effects are part of an explanation of the existence and structure of the mechanism in present day organisms. Such naturally selected effects are the "natural functions" of the respective mechanisms. Thus, we are led to the conclusion that dysfunctions are failures of mechanisms to

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perform functions for which they were naturally selected.

Because developmental mechanisms—at least in the strong "ontogenetic" sense of "developmental"—are considered to be evolutionarily designed to perform their developmental functions, their failure, if harmful, thus qualifies as a disorder, according to the harmful dysfunction analysis. For example, Erikson (1963) claims that generativity is an ontogenetically determined, evolutionarily designed basic motivational urge, whereas Plato claims that generative acts are an outcome of enlightened self-interest (for a comparison of Erikson and Plato on generativity, see Wakefield, in press-d). One consequent difference between the theories is that Erikson's theory implies that someone who fails to be generative might be disordered, whereas Plato's theory, lacking the claim that generativity is a designed function of motivational mechanisms, contains no support for such a conclusion.

I briefly consider an example from Rutter (1988, p. 489) concerning delayed initiation of speech to illustrate how the harmful dysfunction criterion works and is implicitly used to settle questions of diagnosis about developmental disorders:

> We know that normal children vary greatly in the age at which they begin to speak. Some children do not begin until approximately 2 years of age yet subsequently progress entirely normally. Yet others who are delayed in their acquisition of spoken language show all sorts of associated problems that persist long after they speak fluently; such problems include socio-emotional-behavioral abnormalities as well as reading and spelling difficulties. Developmental data on age variations regarding the likelihood of acquiring speech without psychologic sequelae would be helpful in determining what proportion of cases are likely to be due to simple maturational delay. Such data are not available, but they could be obtained. Equally, the data would focus attention on the nature of the group whose language retardation cannot be explained in that way. For example, does that group include cases due to some identifiable neurodevelopmental abnormality, and are the associated psychological problems consequences of the language disorder or do both stem from some underlying pathologic lesion of the brain?

Rutter implies that, regarding the identical developmental deviation of delayed speech at age two, it is probably the case that some instances are disorders and some are not. The difference has to do with the inferred causes. In one group, it is inferred that the cause is simply normal variation in the timing of activation of certain speech mechanisms. Because such delay causes no other symptoms either at the time or later (Rutter notes that this group develops normally once speech begins), and because there is normal variation in the activation of virtually all such developmental mechanisms, it can be inferred that this group's delayed speech is not due to a dysfunction and is not harmful. Consequently, it is not considered a disorder. However, the other group shows later symptoms of various kinds, constituting harm. Moreover, the nature of the harm is such that it can be inferred that something has gone wrong with the functioning of some mechanism; Rutter raises the question of whether the dysfunction is in the language mechanisms alone or in other mechanisms as well, and the answer would be important for classifying the disorder. But, just the fact that we can infer that some mechanism is not performing its function is enough to induce us to classify this harmful condition as a disorder. Although not explicitly named, the criteria of dysfunction and harm are implicitly at work here in shaping judgments about whether conditions are disorders or nondisorders.

Cultural Skills and Disorder: The Puzzle of Reading Disorders

The harmful dysfunction analysis of disorder leaves us with a seeming puzzle. I have argued that a disorder is a failure of a naturally selected function. Yet, there are many conditions that are considered developmental disorders, such as reading disorders (Snowling, 1991) and some other learning disorders, in which it appears that the dysfunction is not of some naturally selected function but rather of a culturally valued function, such as reading. Does the harmful dysfunction analysis imply that there can be no such thing as reading disorders? Lilienfeld and Marino (1994) have

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raised just such an objection. (See Wakefield [in press-c] for a fuller response to this objection than can be given here.)

Of course, reading disorders are perfectly good examples of disorder. Fortunately, there is no inconsistency between this fact and the harmful dysfunction analysis. *In itself,* the fact that one fails to achieve some socially desired condition is not sufficient evidence that there exists a disorder. But, sometimes there are additional considerations that allow one to infer from such a failure that there is indeed a disorder. In the case of reading disorders as well as other learning disorders, the additional assumption is this: *ontogenetic development is such that any normally developing child should, under adequate learning conditions, be capable of developing reading skills.* This assumption about the capacities of normal children allows us to make inferences from the failure to learn to read under adequate learning conditions to the conclusion that there is a disorder underlying the failure. Obviously, the disorder is not in a mechanism designed to enable children to learn to read, because there is no such mechanism. Rather, we infer that there is some (as yet unknown) mechanism with some (as yet unknown) function that we "exploit" in teaching children the skill of reading and that is necessary for learning to read. Failure to be able to learn to read under adequate learning conditions implies that some such mechanism is unable to perform its function. The failure to learn to read does indicate a disorder in the full harmful dysfunction sense, given these additional assumptions, because failure to learn to read indirectly indicates the existence of a dysfunction—in the sense of a failure to perform a naturally selected function—in some mental mechanism. Again, this inference depends on the belief that a certain skill is learnable by every human being whose mental mechanisms are functioning in a developmentally normal manner.

The inferred existence of the failure of a mechanism to perform a naturally selected function—conjoined with the fact that the inferred failure causes harm, such as the inability to learn to read—is sufficient to imply the existence of a disorder, according to the harmful dysfunction analysis. In contrast, sheer inability to achieve socially desirable goals—for example, to learn to play hockey or to dance ballet—are not considered disorders because they do not imply such failures of mechanism function but are merely the result of normal variation in human talent, motivation, or opportunity. Thus, the harmful dysfunction analysis enables one to distinguish conceptually between true disorder and social desirability; not every failure to meet social expectations is a disorder. Also, the harmful dysfunction analysis explains why we distinguish illiteracy from reading disorders; we are not designed to read, so illiteracy in itself is not a dysfunction, but we are designed to be capable of learning skills such as reading, so inability to learn to read under adequate learning conditions indicates a dysfunction.

Harmful Dysfunction and DSM-IV's Definition of Disorder

According to the harmful dysfunction analysis, a mental disorder is a malfunction of a mental mechanism, such as a cognitive, affective, or motivational mechanism. The harmful dysfunction analysis is consistent with some elements of the definition of "mental disorder" presented in the introduction to DSM-IV (pp. xxi–xxii):

> In DSM-IV, each of the mental disorders is conceptualized as a clinically significant behavioral or psychological syndrome or pattern that occurs in an individual and that is associated with present distress (e.g., a painful symptom) or disability (i.e., impairment in one or more important areas of functioning) or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom. In addition, this syndrome or pattern must not be merely an expectable and culturally sanctioned response to a particular event, for example, the death of a loved one. Whatever its original cause, it must currently be considered a manifestation of a behavioral, psychological, or biological dysfunction in the individual. Neither deviant behavior (e.g., political, religious, or sexual) nor conflicts that are primarily between the individual and society are mental disorders unless the deviance or conflict is a symptom of a dysfunction in the individual.

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The very similar definition presented in DSM-III-R, and a lengthier definition from which DSM's definition was drawn, have elsewhere been criticized at length (Wakefield, 1992b, 1993). Here, I focus on useful points, consistent with the harmful dysfunction analysis, that are made by the definition.

First, disorder involves something going wrong in the individual; it is not an unfortunate environmental stress to which a person responds with proportionate emotional pain, but a condition in which something has gone wrong inside the person. (At least, this is true of disorders of individuals; neither DSM nor this article consider how to define pure relationship disorders, where none of the individuals involved in the disordered relationship are themselves disordered.) Second, the internal condition, which must be inferred from manifest symptoms, must be a dysfunction. Not all problematic internal states are disorders; for example, ignorance and appropriate sadness over a loss are problematic internal states but they are not disorders. Third, a dysfunction of some internal mechanism is not enough to imply disorder. Many things go wrong with various mental and physical mechanisms that do not deserve to be called disorders because they do not have sufficiently negative implications for the individual's overall well-being (see below). The difference between dysfunctions that can be classified as disorders and dysfunctions that cannot be classified as disorders thus lies in whether the dysfunction causes real harm to the person. Note that the failure of function is at the mechanism or "part" level, but the harm must be to the person as a whole, not just to the mechanism; for example, a person with one adequately functioning kidney does not have a disorder because there is no harm to the person, even though harm has come to the nonfunctioning kidney. DSM-IV's definition divides the harms that occur as a result of dysfunctions into two main kinds, distress and disability, but in fact any harm directly caused by a dysfunction can be considered a disorder. Finally, it is cautioned that the distress or disability must come about due to a dysfunction and cannot be the result only of social deviance, disapproval by others, or conflict with society or with others. This last condition is meant to preclude the misuse of psychiatry for sheer social control purposes, as occurred in Soviet psychiatry. In sum, DSM-IV's definition is in certain respects consistent with the notion that a disorder is a harmful dysfunction, where the dysfunction is a breakdown in the ability of some internal mechanism to perform a function it was designed by evolution to perform, and the harm is either distress or disability of a kind that is not simply a matter of social disapproval or social conflict.

As we will see later, two of DSM-IV's definitional requirements for disorder are frequently violated by its own criteria. The first is that the condition must be due to a psychological or biological dysfunction; many of the criteria describe human harms (e.g., intense anxiety, excessive use of alcohol) that need not originate in dysfunctions. The second requirement that is often violated is the stipulation that the harm caused by the condition cannot be the result sheerly of social conflict or the attempt by society to control disapproved behavior; many of the criteria involve "symptoms" that are clearly manifestations of social conflict (e.g., arrest for use of illegal drugs, disapproval of alcoholic intake by one's family) and are not harm directly caused by a dysfunction.

Why the "Harm" Requirement is Necessary

To many scientists and researchers, it is an appealing idea that disorder might be defined in sheerly scientific terms, such as in terms of incapacity to perform evolutionarily selected functions. And, many such scientific definitions of disorder have been suggested. (For a critique of one such definition put forward by Eysenck, 1986, see Wakefield, in press-b.) Others believe that disorder is entirely relative to individual and social values and cannot be constrained by factual criteria at all. The harmful dysfunction analysis takes the position that disorder is an intrinsically hybrid term; a disorder judgment requires *both* a value judgment that there is harm *and* a scientific judgment that there is dysfunction (as defined by failure of a naturally selected func-

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tion). In this section and the next, I briefly consider these requirements.

There are many negative harmful events and conditions in life, from externally imposed conditions like poverty and abuse to unfortunate normal variations in physical appearance (e.g., homeliness) or personality (e.g., foolhardiness). According to the harmful dysfunction analysis, among harmful conditions and circumstances, a subset—those caused by dysfunctions—are picked out by the concept of disorder.

While there are often objective indicators of harm, such as the distress or impairment emphasized in DSM-IV, in the end harm is a value term the application of which is determined by complex social judgments and social circumstances. There is thus a degree of cultural relativism in disorder judgments; some part-dysfunctional conditions that might be considered harmful and thus disorders in one society are not considered harmful in another society and thus are not disorders in that society. For example, inability to learn to read due to a dysfunction in the corpus collosam (supposing that this theory of some forms of dyslexia is correct) is harmful in literate societies, but not harmful in preliterate societies where reading is not a skill that is taught or valued, and thus not a disorder in those societies. In some cultures, the white skin color associated with simple albinism (which is due to a metabolic dysfunction) is of no consequence, whereas in others it may offend basic color sensibilities and be considered a great misfortune, and thus constitute a disorder. Even certain mild forms of simple schizophrenia that are disorders in our society because they prevent an individual from partaking in work as it is structured here may not prevent someone from leading a successful work life in a culture based primarily on fishing, hunting, and gathering and thus may not be disorders in such a society (Wakefield, 1994).

When a condition involves no significant harm, there is no disorder, even if there is an obvious dysfunction in naturally selected mechanisms. For example, most people have what physicians call "benign anomalies," that is, minor malformations that are the result of genetic or developmental errors but that cause no significant problem, and such anomalies are not considered disorders. Similarly, even when infectious agents multiply in the body, one is not considered ill unless harm results, as in the case of the common cold: "On average, up to 90 percent of people exposed to a cold virus become infected, meaning the virus multiplies in the body, but only 40 percent actually become sick" (Ramirez, 1996).

The principle of "no harm, no disorder" that applies to physical disorders also applies to mental disorders, including developmental disorders. For example, to use an example to which I will return later, some children move directly from sitting to walking without going through a stage of crawling. Although crawling is generally considered an ontogenetically determined developmental stage, a child's failure to crawl is not considered a disorder because there is no known harm that comes of it. (I assume here for the sake of argument that such failure is sometimes due to a dysfunction of mechanisms designed to trigger crawling, although it is possible that lack of crawling may be merely a matter of early onset of walking conjoined with late maturation of crawling mechanisms, making the crawling superfluous.) It is of course possible that crawling had a significant function when it evolved—for example, the mobility allowed by crawling might have been enough to enable an infant to get away from certain dangers—but no such advantages of crawling seem to exist in our environment, so no harm results from lack of crawling.

When this harm principle is not respected, invalid criteria result. Consider, for example, the following DSM-III diagnostic criteria for Atypical Stereotyped Movement Disorder (p. 77):

> This category is for conditions such as head-banging, rocking, repetitive hand movements consisting of quick, rhythmic, small hand rotations, or repetitive voluntary movements that typically involve fingers or arms. These disorders are distinguishable from tics in that they consist of voluntary movements and are not spasmodic. Moreover, unlike individuals with a Tic Disorder, those with these conditions are not distressed by the symptoms and may even appear to derive enjoyment from the repetitive activities. Though bizarre posturing or

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movements may occur in adults, these conditions are found almost exclusively in children. They are especially prevalent among individuals with Mental Retardation or Pervasive Developmental Disorders and among children suffering from grossly inadequate social stimulation, but they may also occur in the absence of a concurrent mental disorder.

Tic Disorder and Tourette's Disorder involve involuntary behavior, so dysfunction—and, due to the nature of the involuntary behavior, harm as well—is apparent in those cases. Although stereotypic movement is voluntary, it is often associated with serious developmental disorder, and that and its nonfunctional nature provide plausible evidence that such movement, although voluntary, may be caused by some unknown dysfunction. So, when such stereotypic movement occurs alone, without a developmental disability, one may infer with some plausibility that there is a dysfunction. Nevertheless, these criteria are invalid as indicators of disorder because they do not require that the child or anyone else must be harmed by the movements before diagnosis is warranted. A degree of stereotypic movement, such as rocking back and forth in bed before going to sleep, is not unknown in otherwise normal children. It is entirely possible that in some cases, such movement can be a benign dysfunction that is not a disorder. For example, if a child, otherwise normal, engages in repetitive rocking motions at night before going to sleep, with seeming pleasure and no interference with other functioning, and the behavior can be expected to cease as the child gets older, there are no grounds for considering the child disordered. DSM eventually recognized this very point. Diagnostic criteria for Stereotypy/Habit Disorder were changed in DSM-III-R (and have remained so in DSM-IV) to include the following clause: "The disturbance either causes physical injury to the child or markedly interferes with normal activities, e.g., injury to head from headbanging; inability to fall asleep because of constant rocking" (p. 95). This addition increases conceptual validity by insisting on harm, consistent with the harmful dysfunction analysis.

Implications of the "Dysfunction" Requirement for Diagnostic Criteria

Many DSM-IV criteria are inconsistent with the dysfunction requirement as put forward by the harmful dysfunction analysis as well as by DSM-IV's own definition of disorder, which requires that the symptoms be caused by a dysfunction (1994, pp. xxi–xxii). A few typical examples of invalidities in DSM-IV criteria due to failure to meet the dysfunction requirement are presented in the following subsections.

Conduct Disorder

DSM-IV diagnostic criteria for Conduct Disorder inappropriately allow the diagnosis of adolescents as disordered who are responding with antisocial behavior to peer pressure, to the dangers of a deprived or threatening environment, or to abuses at home, even though such adolescents need not be suffering from a disorder. Rebellious kids or kids who fall in with the wrong crowd and who skip school and do a bit of shoplifting and vandalism also can qualify for diagnosis, despite the very high incidence of such behaviors among normal adolescents. Regrettably, Tom Sawyer and Huck Finn fare no better diagnostically under DSM-IV criteria than they did under DSM-III-R criteria (Richters & Cicchetti, 1993).

For example, if an emotionally abused child of alcoholic parents runs away from home for the second time in a year, in the course of which he breaks into a car and steals some change in order to buy something to eat, and the child's academic and social functioning are impaired by his running away, these events are enough to warrant diagnosis of the child as Conduct Disordered (DSM-IV criteria 10, 12, and 14). Or, if a child, attempting to avoid escalating sexual abuse by her stepfather, lies to her parents about her whereabouts and often stays out late at night despite their prohibitions and, tired during the day, she often skips school, thus impairing her academic and social functioning, on this basis alone she can be diagnosed as Conduct Disordered (DSM-IV criteria 11, 13, and 15). Yet, neither

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child need be disordered to be responding in this way to their environments.

These invalidities cause serious problems for clinical practice and research because of the heterogeneity of the kinds of cases that fall under the criteria. Clinically, this heterogeneity means that the "diagnosis" of Conduct Disorder has little relation to the kind of treatment that is appropriate. Regarding research, the heterogeneity means that samples selected on the basis of the criteria may have nothing scientifically or theoretically interesting in common.

In response to arguments such as those above, DSM-IV incorporated some cautionary comments consistent with the harmful dysfunction analysis into the text discussing the category of Conduct Disorder, admitting that the criteria are not conceptually valid as they stand (p. 88):

> Concerns have been raised that the Conduct Disorder diagnosis may at times be misapplied to individuals in settings where patterns of undesirable behavior are sometimes viewed as protective (e.g., threatening, impoverished, high-crime). Consistent with the DSM-IV definition of mental disorder, the Conduct Disorder diagnosis should be applied only when the behavior in question is symptomatic of an underlying dysfunction within the individual and not simply a reaction to the immediate social context. Moreover, immigrant youth from war-ravaged countries who have a history of aggressive behaviors that may have been necessary for their survival in that context would not necessarily warrant a diagnosis of Conduct Disorder. It may be helpful for the clinician to consider the social and economic context in which the undesirable behaviors have occurred.

These comments do preclude the invalid diagnoses described above. However, DSM-IV did not attempt to incorporate such considerations into the criteria. Yet, it is the criteria, not textual comments, that are almost always used for sample selection and evaluation in research studies. Thus, from a research standpoint, these issues have yet to be addressed. Moreover, the same kinds of problems affect many other categories but are unrecognized in DSM-IV's text, as in the following examples.

Learning Disorders

DSM-IV criteria for Learning Disorders require only that the child's achievement level be substantially below average. Thus, for example, as Kirk and Kutchins (1994) argue, the criteria for Disorder of Written Expression do not distinguish very bad penmanship from disorder. Clearly, a distinction is needed here: bad penmanship is not a disorder in itself, but bad penmanship caused by a dysfunction in one of the mechanisms that enable children to learn to write is a disorder. This sort of distinction has been common in the Learning Disorders community for decades, and it requires that before diagnosing a child with a Learning Disorder, one must attempt to eliminate possible "normal" causes of the lack of achievement, such as family distractions, lack of motivation, lack of educational opportunity, or inability to understand the language of instruction. The problem is not with the category of Disorder of Written Expression or the other Learning Disorders but with the invalid DSM-IV criteria.

Separation Anxiety Disorder

Separation Anxiety Disorder is diagnosed in children on the basis of symptoms indicating age inappropriate, excessive anxiety concerning separation from those to whom the individual is attached, lasting at least 4 weeks. The symptoms (e.g., excessive distress when separation occurs, worry that some event will lead to separation, worry that harm will come to attachment figures, refusal to go to school because of fear of separation, reluctance to be alone or without major attachment figure) are just the sorts of things children experience when they have a normal, intense separation anxiety response. The criteria do not adequately distinguish between a true disorder in which separation responses are triggered inappropriately and normal responses to unusual perceived threats to the child's primary bond due to an unreliable caregiver or other serious disruptions. For example, in a study of children of military personnel at three bases (Bickman et al., 1995) that happened to take place at the time of Desert Storm, when many

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parents of the children were in fact leaving for the Middle East and where children knew that parents could be killed or injured, the level of separation anxiety was high enough among many of the children that they would qualify as having Separation Anxiety Disorder according to DSM-IV criteria (relative to typical separation responses at their ages, their reactions were "excessive"), but in fact they were responding with proportional, normal-range separation responses to a highly unusual environment in which they had realistic concerns that the parent would not come back (A. M. Brannan, personal communication). The DSM-IV criteria are likely to be used in drug trials, which raises ethical concerns; normal children whose attachments are threatened in reality may be treated with drugs, as though they have disordered attachment responses, rather than having their real attachment needs addressed.

Substance Abuse

DSM-IV diagnosis of Substance Abuse requires any one of four criteria: poor role performance at work or at home due to substance use; substance use in hazardous circumstances, such as driving under the influence of alcohol; recurrent substance-related legal problems; or social or interpersonal problems due to substance use, such as arguments with family members about substance use. These criteria are not only face invalid as indicators of disorder, they are also inconsistent with DSM-IV's own definition of mental disorder, which asserts that "symptoms" must not be due sheerly to conflict with society. Yet, arrests for illegal activity and disapproval of family members are sufficient for diagnosis of disorder according to DSM-IV's criteria. For example, arguing with one's spouse about alcohol or drug use is sufficient by itself for being diagnosed with Substance Abuse; if you drink or smoke marijuana, your spouse can now qualify you for diagnosis with a mental disorder simply by arguing with you about it, and can "cure" you by becoming more tolerant. Given that parents are likely to argue with their children or adolescents about even minor experiments with alcohol or drugs, this criterion is potentially dangerously overinclusive with respect to adolescents. Being arrested more than once for driving while under the influence of alcohol or for possession of marijuana is also sufficient for diagnosis, making one's diagnostic status depend on the diligence of the local police force and the vagaries of local drug laws. As to the "hazardousness" criterion, it is clear that nondisordered adolescents and people in general are willing to risk driving under the influence of alcohol for all kinds of foolish reasons, and that one need not have a mental disorder to do so.

Major Depressive Disorder

DSM-IV criteria for Major Depressive Disorder include an exclusion for uncomplicated bereavement (up to 2 months of symptoms are allowed as normal) but no exclusions for equally normal uncomplicated sadness reactions to other major losses, such as a terminal medical diagnosis in oneself or a loved one, separation from one's spouse, the end of an intense love affair, or loss of one's job. If in grappling with such a loss, one's reaction includes just 2 weeks of depressed mood, diminished pleasure in usual activities, insomnia, fatigue, and diminished ability to concentrate on work tasks, then one satisfies DSM-IV criteria for Major Depressive Disorder, even though such a reaction need not imply pathology any more than it does in bereavement.

Unfortunately, the logic of these kinds of invalidities in these and other DSM-IV criteria sets and the resulting false positives have not been clearly recognized by child epidemiological researchers. The general strategy in DSM-IV as well as in epidemiological studies for dealing with inflated prevalence estimates that result from these kinds of overinclusiveness is to add impairment criteria to the diagnostic criteria to lower the prevalence to an acceptable range consistent with common sense (e.g., Costello, Angold, Burns, Erkanli, Stangl, & Tweed, 1996; Shaffer et al., 1996). However, this is not an adequate cure for the validity problems afflicting DSM's criteria.

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The problem with the criteria is not so much that the criteria do not require sufficient impairment or harm—in many cases of nondisorder (e.g., grief) the intensity of distress or impairment is as great as in disorder—but that the criteria do not pick out harms that are due to dysfunctions. Adding impairment criteria may increase validity because on average dysfunction may produce more severe symptoms than nondysfunctional analogs, but there is no clear rule here. Impairment criteria are no substitute for directly addressing the dysfunction requirement.

Some Implications of the Harmful Dysfunction Analysis for Developmental Psychopathology

The harmful dysfunction analysis, I believe, provides a surprisingly strong complement to developmental psychopathology. The analysis suggests that the very concept of disorder is such that a developmental approach is often necessary, and the analysis converges with developmental psychopathology in many other specific respects, as well. A few of the relevant implications of the analysis are listed briefly here.

The study of disorder is the study of underlying mechanisms and processes as much as it is the study of symptoms; symptoms are insufficient to define disorder versus nondisorder. By definition, a disorder involves a failure of an internal mechanism to perform its function. Thus, the study of psychopathology is the study of such internal mechanisms, their normal functions, and their failures to perform their functions. Of course, such internal mechanism failures must be studied to a large degree through their manifestations in symptoms, but due to equifinality, the correspondence between dysfunction and symptoms is not the straightforward one that is assumed by DSM-IV. Many symptoms that can indicate failures of function can also be generated in other ways that do not involve dysfunctions. For example, antisocial acts can be due to such dysfunctions as lack of impulse control or lack of moral conscience, but they can also be normal responses to dangerous or impoverished community conditions where alternative opportunities are lacking. Extreme sadness can be due to a dysfunction of sadness generating mechanisms, as in depressive disorder, or it can be due to normal grief following the loss of a loved one. Whether a given set of symptoms indicates a disorder is not generally determined by the symptoms themselves, but by how and under what circumstances the symptoms were generated from internal mechanisms. Thus, diagnosis requires an inference about the nature and functioning of internal mechanisms.

The study of disorder is the study of how the individual's history led to the development of symptoms. Why is an understanding of the individual's history so important in studying disorder? As Cicchetti and Tucker (1994a) have noted, a historical approach is necessary in part because it is virtually the only effective way of dealing with the sheer complexity of the structure and causation of disorder. A disorder can result from a sequence of complex interactions among many mechanisms and many environmental features. In principle, one might circumvent historical understanding by formulating a full structural description of the individual's system of internal states at a given time, including the "intentional system" of representational states (Wakefield, 1989) and the set of naturally selected mechanisms, that explains the generation of symptoms. But, in practice, a historical narrative is often the only way to make sense of the mass of relevant facts. Causal history is also essential because it is the only way to identify causality and thus possible intervention points for prevention. Finally, causal history is critical because of the need to understand the relationship between inner states and environmental variables in assessing function and dysfunction (see below).

The study of disorder is the study of the interaction between internal mechanisms and the environment. Many of our mental mechanisms are designed to respond in different ways to different environmental circumstances; for example, degree of fear varies with the amount and imminence of perceived danger. Thus, to know whether a feeling or action is a symptom of disorder or a normal response to the environment, one has to un-

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derstand the nature of the environment, the nature of the meanings the individual imparts to the environment, and the history of the individual's interactions with the environment in some detail. Only through an analysis of the evolving relationship between the individual and the environment can one discern whether certain responses are due to inappropriately and dysfunctionally activated mechanisms or to normal responses to an unusual environment or to an unusual but normal sequence of person–environment interactions. To take a simple example, one cannot tell whether feelings of extreme sadness are depressive disorder without understanding the individual's history of loss, and one cannot understand whether antisocial behavior is due to conduct disorder without knowing the nature of the social norms in the individual's environment of origin.

The study of disorder is the study of mechanism–environment interactions relative to an evolutionarily defined "expectable environment." In general, mechanisms have been selected to operate on the assumption that there exists a certain kind of "expectable" environment; mechanisms are selected as adaptations to such expectable environments. It is not necessarily a disorder if someone displays symptoms under conditions where the expectable environment is lacking. Of course, such "disordered environments" *may* induce disorders by causing enduring breakdowns in internal mechanisms, but this need not happen. For example, if people are getting more anxious these days, that could be due to individual disorders, or it could be due to the demands of occupations that are beyond what people are designed to be able to handle without anxiety; and, if more children seem maladaptively "hyperactive," that could be due to individual disorders, or it could be due to greater constraints being placed on children in larger classrooms and in home environments where parents are overworked and anxious and do not have the patience for dealing with naturally rambunctious children. To tell the difference between disorder and nondisorder, we often need to tell the difference between symptoms due to mechanisms failing to do what they were designed to do and symptoms due to environmental changes interacting with mechanisms that are operating as they were designed. This kind of inquiry can be pursued only by understanding the expectable environment to which mechanisms were adaptations.

These comments offer a brief taste of the implications of the harmful dysfunction analysis that are congruent with the approach of developmental psychopathology. Both approaches recognize the complexity of disorder, the inferential nature of the judgment that there exists a disorder, the often continuous nature of the disorder–nondisorder dimension (both dysfunctionality and harm are matters of degree), the subtle interweaving of internal and environmental considerations, and the necessity of identifying a causal history of the genesis of symptoms to understand the symptoms and judge whether they represent a disorder. The very nature of disorder, according to the analysis, explains why many of the methodological and explanatory features distinctive of developmental psychopathology are particularly appropriate and even necessary to the study of disorder.

Scope and Limits of Predictive Validity in Developmental Psychopathology

Predictive validity is generally considered to be of central importance in establishing the existence of psychopathology, and this is especially so within developmental psychopathology because of the field's emphasis on the temporal, developmental aspect of disorder. For example, Achenbach (1988) presents predictive validity as a "key feature" of developmental psychopathology (p. 550):

> To judge whether an individual's behavior is 'pathological,' we need to know the likely outcome of the behavior in subsequent developmental periods. This requires longitudinal or follow-up studies of behavior to determine which patterns have especially unsatisfactory outcomes.

There is an obvious reason for this emphasis on predictive validity as a necessary arbiter in distinguishing disorder from nondisorder. In ontogenetic disorders, it is often the case that a primary function of each stage of

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development is its contribution to the later, more mature states of the organism; this is certainly true of many child developmental stages. Thus, the failure of designed function can often best be judged by whether there are harmful consequences for later development. If there are none, then, it might be thought, there is no warrant to call the earlier condition a disorder because no function has failed to be performed.

The harmful dysfunction analysis suggests some limits to the role of predictive validity in establishing the existence of disorder. There are two ways that a developmental stage can go wrong; the stage itself may not occur as it is designed to occur, and the stage may not do what it is designed to do to contribute to future stages. Predictive validity is essential for only one of these possible kinds of disorders, the failure of a future-oriented function. However, there can be failures of developmental stages that do not show up in later developmental problems but are nonetheless disorders because they are dysfunctions of the stages themselves. And, there can be nondisorders that are nonetheless precursors of and therefore predictors of later disorder. Simply put, a condition can be a disorder without having predictive validity, and a condition can be a nondisorder despite predictive validity. Even among childhood conditions, not all can be evaluated for disorder status only in terms of their implications for later development; many childhood dysfunctions have harmful consequences for the child, however transient they may be, and are therefore disorders.

For example, trichotillomania—an irresistible urge to pull out hairs and a sense of relief after hairs have been plucked, often leading to severe hair loss and even tissue damage—is believed to be much more common (perhaps as much as 7 times as common) in children than in adults, but appears to generally take a benign form in childhood insofar as developmental implications are concerned: "Clinical reports indicate two forms of trichotillomania: one, thought to be benign and self-limited, has its onset between 2 and 6 yrs of age; the other, associated with greater psychopathology, begins during adolescence" (Swedo & Rapoport, 1991, p. 402). Yet, this developmentally "benign" childhood condition is considered a disorder because, although the condition is benign in the sense that it does not predict long-term disorder, it is intrinsically harmful and painful to a child and so is not benign at the time it occurs. These immediate harmful consequences, although independent of predictive validity, warrant classification of the condition as a disorder.

Of course, harm is not sufficient for disorder. The harmful dysfunction analysis predicts that a condition will be properly considered a disorder only if it is perceived to be caused by a dysfunction. This is the case with trichotillomania, which seems to clearly indicate that something has gone wrong with some motivational system; there appears to be no plausible "normal" explanation for pulling out one's hair to the extent that people with trichotillomania do so. Understanding such a disorder depends on getting clearer about the precise nature of the involved mechanism and dysfunction. Partly on the basis of animal evidence, it is believed that in the case of trichotillomania there may be a dysfunction of mechanisms underlying grooming motivation, so that grooming urges are excessive in strength and persistence and are not satisfied by usual grooming activities (Swedo & Rapoport, 1991, p. 405). Once one gets beyond symptoms to mechanisms and functions, new vistas for treatment may open up. For example, understood as a dysfunction of grooming mechanisms, trichotillomania can be seen to perhaps be part of a continuum of grooming disorders that include compulsive nail biting and compulsive hand washing or other self-cleaning compulsions, and treatment that has proved useful for one of these other disorders may then be tried for trichotillomania (Swedo & Rapoport, 1991, p. 405).

It would seem that the emphasis on predictive validity is useful within a certain range of cases but has its limits. True disorder need not predict later disorder (or other maladaptiveness), as in childhood trichotillomania. For example, some forms of schizophreniform reactions may be distinguishable from schizophrenia by their relatively impermanent nature, but they are still disorders because

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they involve serious harm and are caused by dysfunctions, though perhaps both harm and dysfunction are transient. (Such reactions are of course to be distinguished from harmless and nondisordered hallucinations and delusions that sometimes occur when, for example, one imagines one is talking to a recently deceased loved one.) Many disorders are self-healing but nonetheless disorders. Again, in attempting to distinguish between conduct disordered and nondisordered sources of adolescent criminal and antisocial behavior, it is tempting to use the criterion of whether the antisocial behavior continues into adulthood. However, some adolescents may suffer from genuine disorders that ameliorate, and other adolescents who have no disorder and who engage in antisocial behavior for other reasons may continue to do so into adulthood for the same nondisordered reasons or in response to the same environmental variables that existed in adolescence. So, persistence of the behaviors in itself is not an adequate criterion for whether the adolescent behaviors are caused by a disorder. (For an excellent discussion of the complexities of diagnosing conduct disorder in the light of the harmful dysfunction analysis, see Richters & Cicchetti, 1993.)

On the other hand, if there is no present harm from a developmental dysfunction, then, according to the harmful dysfunction analysis, the only basis for labeling the condition a disorder is predictive validity that indicates future harm. In particular, the predictive-validity criterion is the final arbiter of disorder and nondisorder for a subset of dysfunctions that are specifically failures of *developmental* functions in the sense that they are failures of functions that are concerned exclusively with building future structures. For example, as noted earlier, crawling is widely assumed to be an ontogenetic stage. Nonetheless, infants who skip the crawling stage and proceed directly to walking are not considered disordered because it is not generally believed at present that failure to go through the crawling stage in itself results in any harm to the child's future development (the child's later ability to crawl does not seem to be impaired), and there is no other immediate benefit of crawling that seems relevant to assessment of disorder (e.g., a brief delay of mobility does not seem a significant harm in contemporary environments; back muscles and motor coordination seem to develop anyway, etc.). In such cases, it is predictive validity that must be used to decide whether there is a disorder. If there *were* another developmental function of crawling—if, for example, it were established, as has been speculated, that there is a connection between development of motoric sequencing skills in crawling and development of linguistic skills, and that skipping the stage of crawling leads to impairment of later linguistic performance—then such harms would induce us to classify failure to crawl as a disorder.

So, for the specifically developmental, future-oriented aspect of ontogenetic developmental mechanisms, the predictive-validity criterion is critical. But for disorders in general, it is useful but fallible as a criterion for disorder.

Conclusions

This has been a first exploration of some aspects of the relationship between developmental psychopathology and the harmful dysfunction analysis of mental disorder. This initial foray focused on gross features of the relationship's terrain and did not attempt to deal with the full detail or subtlety of each of these positions. Many additions, qualifications, caveats, elaborations, and emendations would be needed to adequately reflect the full nature of each area and the relationship between them. The goal here was to reconnoiter the relationship to see if further exploration and analysis is warranted.

We started with the observation that many kinds of developmental deviations are not disorders, so "developmental deviation" is not a sufficient criterion for disorder unless one supplements this criterion with an explanation of which kinds of deviations are disorders. And so we asked, what is the criterion that tells us which developmental deviations are disorders?

We saw that the predictive-validity criterion is not an adequate supplement to the de-

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velopmental-deviation thesis in validating disorder criteria; some conditions that indicate future disorder are not themselves disorders, and some conditions that do not predict future disorders are themselves disorders. Nor, because of the complexity of the relationship between disorder and manifest symptoms, do DSM-IV criteria provide the needed account. Many of the examples above revealed instances in which DSM-IV criteria are invalid because they overinclusively label nondisorders as disorders. Moreover, the great variety of developmental mechanisms and their possible failures present the developmentalist with a spectrum of potential disorders that are not encompassed in either the categories of DSM-IV or in the standard dimensions used by developmentalists as the main alternative to DSM-IV diagnosis (Quay, 1986). Developmental psychopathology theory and research requires some further criterion for disorder that is adequately flexible for developmental purposes and yet retains sufficient rigor to yield valid criteria.

In keeping with an analysis presented elsewhere, I proposed that developmental deviations (or, for that matter, any conditions) are disorders when and only when they are harmful dysfunctions, where harm is judged by social values and dysfunction is the failure of some internal mechanism to perform a function for which it was naturally selected. The remainder of the article was concerned with illustrating some of the implications for developmental psychopathology of adopting the harmful dysfunction analysis as a criterion for disorder. Both the harm and dysfunction requirements were shown to offer potent tools for evaluating whether conditions are disorders and for critiquing and improving diagnostic criteria. Because the validity of diagnostic criteria is critical to the success of research on psychopathology, the harmful dysfunction analysis was thus shown to be a powerful ally of the researcher.

The relationship between developmental deviation and disorder turns out to be an exceedingly complex one. Some developmental deviations are deviant only in a statistical sense (e.g., benign late onset of speech) and some may be healthy adaptations to deviant environments (e.g., criminal behavior in an environment where such behavior offers the only hope of surviving) or simply unusual idiosyncratic solutions to adaptive challenges. These deviations are neither dysfunctions nor harmful, and are not disorders. Some deviations, such as illiteracy or lack of vaccination, are harmful but are not due to internal dysfunctions and so are not disorders. Intense anxiety due to great challenges, intense fear due to great danger, and intense sadness due to great loss are generally not disorders because, though painful and to that extent harmful, they result not from dysfunction but from mechanisms responding to the environment in the way they were designed to respond.

Other developmental deviations are due to true dysfunctions, that is, conditions in which some inner developmental mechanism does not perform some function for which it was naturally selected. However, in many cases of deviation due to dysfunction, such as failure to crawl or benign stereotypic rocking behavior, no harm to the person results from the dysfunction. Moreover, many kinds of dysfunctions fail to have negative effects on the individual because of such factors as redundancy of function, resilience of the individual, natural plasticity that allows for alternative ways of achieving a mechanism's function, or active attempts by the individual to create mental structures that enduringly compensate for the dysfunction. In such cases of harmless dysfunction, there is no disorder.

Finally, there are those cases of deviation due to dysfunction where the dysfunction causes harm either immediately or in later developmental stages. Such conditions are disorders.

The higher level of abstraction at which the harmful dysfunction analysis takes place relative to DSM-IV criteria or factor-analysis derived dimensions has the disadvantage that it does not immediately imply concrete diagnostic criteria. But it has the advantage that it offers a schema for developing specific criteria for disorder that is not tied to assumptions rooted in a nondevelopmental model. Indeed, the harmful dysfunction analysis of disorder was argued to be an account that portrays disorder in such a way as to explain the need for many of the distinctive methodological approaches of developmental psychopathology.

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The analysis implies the importance for psychopathological theory of identifying normal developmental mechanisms and the many different functions that such mechanisms are selected to perform, because the nature and proper classification of a disorder depends on the mechanism that is malfunctioning and on the specific dysfunction affecting the mechanism. And, the analysis encourages us to better distinguish various pathways, including interactions over time between idiosyncratic features of both the individual's mechanism functioning and the individual's environmental circumstances, that lead to symptomatic outcomes. Only then can we identify those harmful outcomes that are due to dysfunctions and thus are disorders. In these and other ways, the analysis explains why it is essential in attempting to understand psychopathology to do research that has exactly those features that are distinctive of developmental psychopathology.

In sum, my tentative conclusions as well as my hopes regarding the relationship between developmental psychopathology and the harmful dysfunction analysis of disorder are well expressed by the final line from the movie *Casablanca:* ". . . I think this is the beginning of a beautiful friendship."

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