

# The Emptiness of Holism

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*An old psychological controversy concerning the relative merits of clinical and statistical prediction has direct implications for modern-day beliefs in "holism." The notion that one should not consider individual factors, but rather a complex whole, is frustratingly vague and incompatible with all that we have learned about human cognitive limitations and judgmental biases. Despite its seeming compassion, the mantra of holism may constitute empty rhetoric that shields its proponents from the hard work of discovering, assessing, and validly integrating meaningful information.*

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A half-century ago, psychologists were embroiled in a debate over the utility of unaided human judgment for combining available information to reach important decisions. In what remains the definitive treatise on this subject, Meehl (1954) argued that there is no theoretical or empirical reason to suspect that we can combine information in our heads as effectively as we can by using a simple statistical or actuarial procedure. Over the past fifty years, research on clinical judgment has consistently shown that Meehl was correct (e.g., Dawes, Faust, and Meehl 1989; Grove, Zald, Lebow, Snitz, and Nelson 2000). This research has direct bearing on modern beliefs in "holism," the proposition that practitioners should consider not individual pieces

of information, but a complex whole.

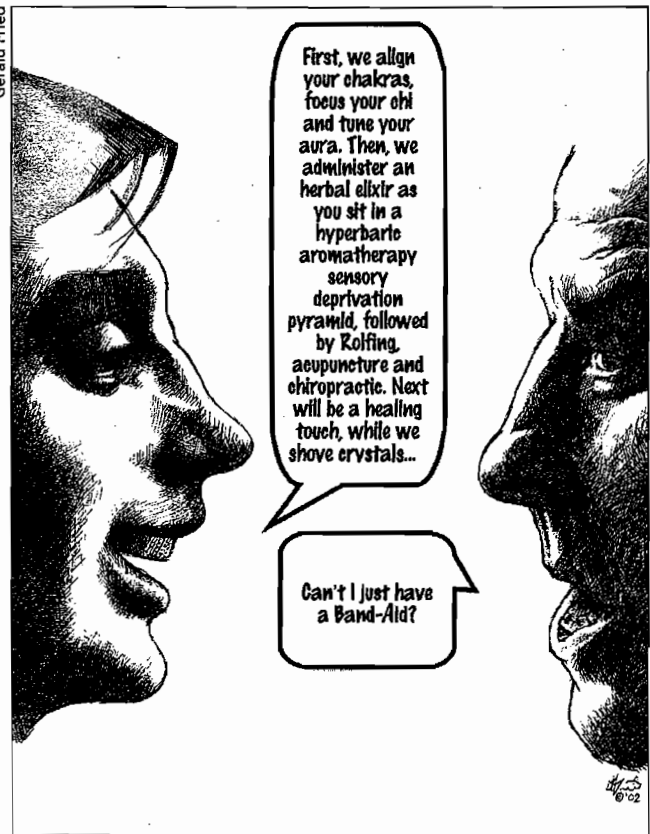
Holism has achieved a considerable following among some health care professions (we now have self-styled holistic healers, holistic veterinarians, holistic nurses, and others) and believers in paranormal phenomena (witness modern astrology's insistence on the use of the "whole chart") despite a highly questionable rationale and virtually no empirical support. Proponents of holism espouse vague, ill-defined practices that require psychologically impossible feats of judgment. In this sense, holism provides a façade of compassion behind which the idiosyncratic, free-for-all approaches of its practitioners are shielded from skeptical scrutiny.

### Vague Retreats from Reality

Holists disparage scientific theory and method through the use of painfully ambiguous language that intentionally discards valuable information. Gilovich (1991, 125) quotes Roger Lambert, a character in John Updike's *Roger's Version*, who notes, "Next to the indeterminacy principle, I have learned in recent years to loathe most the term 'holistic,' a meaningless signifier empowering the muddle of all the useful distinctions human thought has labored at for two thousand years." This weakness can be demonstrated through a clear case with obvious consequences. If you broke your leg, would you prefer (a) to have a doctor put it in a cast and give you crutches; or (b) to have a holistic healer, rather than dealing specifically with your leg, treat you as a "whole person" by prescribing some mixture of acupuncture, herbs, homeopathy, magnets, nutritional supplements, reflexology, therapeutic touch, and/or other alleged remedies? In other words, should a broken leg be treated directly or be considered a broader problem in need of a broader remedy? It seems likely that even the most staunch advocate of holistic medicine, upon breaking his or her leg, would want a cast and some crutches.

For many, this logic becomes more murky when thinking about less directly observable events. But why should it? When your car breaks down, do you want a mechanic to assess and repair the specific mechanical failure or to holistically repair the "whole car?" If this choice seems clear enough to you, you might be surprised by an analogy on the American Holistic Veterinary Medical Association's (AHVMA) Web site. Here, a common (though grotesque) distortion of the car-repair analogy is used to help promote the full range of "holistic healing" practices for pets. Although the AHVMA formally endorses evidence-based treatments, it simultaneously perpetuates a continual and only thinly veiled assault on science. After noting that "conventional" treatments "are employed simply to make the symptoms go away," it presents the following false analogy which reveals its hostility to science: "Picture a car with a low oil warning light. Extinguishing the light will certainly make the sign go away, but will it solve the problem?" The clear implication is that scientists, and unenlightened veterinarians, are so unfathomably inept that they would "extinguish the light" in some way *other* than adding oil! In reality, this scenario misrepresents the source of disagreement between the scientific and holistic approaches: What should be done to

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address a specific problem? In this example, the "whole car" is not broken—so what, one might ask, would a holistic auto mechanic do? The holistic vets are silent on that point. Thus, even the example chosen to disparage science shows that it undoubtedly involves the smartest course of action: to validly detect the *specific* problem (low oil) and treat it in a *targeted manner* (add oil). By contrast, holism is empty rhetoric.

Consider an additional example that is not hypothetical, but drawn from the beliefs of modern astrologers (see Kelly 1997) that they must make use of the "whole chart" to render professional judgments. Astrology is based on the belief that all natural phenomena are influenced by celestial bodies, and there is partial truth to this: "Every time we wake up with the sun, or plan barbecues on moonlit nights, or go fishing at high tide, we are showing how celestial bodies have real influence in our lives" (Kelly 1997, 1035). But these influences are far more trivial than the grand claims of astrology suggest. For centuries, astrologers were consulted for assistance in making important, practical decisions: Should I marry this person? Should I wage war against this nation? Around the 1950s, however, science began to catch up with astrology and test the predictions that astrologers made. These tests revealed that astrologers were unable to make predictions any better than chance-level guessing (for reviews, see

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Dean, Mather, and Kelly 1996; Kelly 1997, 1998).

In the face of overwhelming negative evidence, astrologers faced a tough choice: either reject their discredited beliefs or create post-hoc explanations. In true pseudoscientific form, astrologers embraced a range of evasive tactics, including holism. Thus, modern astrology pays little attention to the evidence against it because "the horoscope is a whole system in which every part is influenced by every other part" (Kelly 1997, 1044). That is, because they have tested only one astrological factor at a time, failing to take into account the "whole chart" that professional astrologers supposedly utilize to make their predictions, scientific investigations are viewed by astrologers as invalid tests of their trade.

### **Through the use of evasive language, holists sidestep the burden of determining what information is relevant and following a justifiable procedure for assessing and integrating this information.**

In astrology—as in all other empirical matters—this holism defense is fatally flawed. One can rightly ask just what "the whole chart" means:

Where does the whole chart end? With ten planets [astrologers count the Sun and our Moon, though none of the dozens of other moons in our solar system, as planets], twelve signs, twelve houses, midpoints, Arabic points, nodes, aspects and whatever other astrological concepts may be used, it is simply impossible to interpret a "whole chart." When astrologers claim that they use the whole chart, they only refer to the fact that they use more factors than just one. Nevertheless, no matter how many factors they use, they always use a restricted number of factors, and therefore only a part of the horoscope. They never use the whole chart. But then the question becomes how many factors would be considered, and which factors?... Suppose that I consider as many as 20 factors, then undoubtedly an astrologer will come up who claims that I should use 21 factors. (Van Rooij 1994, 56)

Thus, the "whole chart" is just as much a convenient fiction as the "whole person" or the "whole car." Through the use of evasive language, holists sidestep the burden of determining what information is relevant and following a justifiable procedure for assessing and integrating this information to reach a decision.

#### **Lessons From Research on Clinical Judgment**

The study of clinical judgment bears directly on this point. Like holism, the clinical approach to prediction is associated with a desire for narrative truth (a plausible "good story" involving causal explanations) as opposed to historical truth (a factually correct account involving probabilistic explanations; Dawes 1994). The accuracy of judgments made in a methodical way from just a few relevant pieces of information is equal or superior to that of judgments made by experts who combine a wide array of information in an intuitive manner (for a review, see Dawes, Faust, and Meehl 1989). Findings clearly and consistently indicate that a probabilistic relationship is

more readily obtained and verified than a causal understanding and that historical truth is more useful than narrative truth:

There is no controversy in social science that shows such a large body of qualitatively diverse studies coming out so uniformly in the same direction as this one. When you are pushing 90 investigations, predicting everything from the outcome of football games to the diagnosis of liver disease and when you can hardly come up with a half dozen studies showing even a weak tendency in favor of the clinician, it is time to draw a practical conclusion (Meehl 1986, 374).

This superiority of statistical over clinical prediction has been attributed to two complementary sources: the desirable mathematical properties of statistical techniques, which are

extremely effective tools for detecting relationships amidst considerable variation, and the cognitive limitations and biases of unaided human judgment. For example, because our memory and processing capabilities are limited, our judgment often relies heavily on mental shortcuts—or "heuristics" (Kahneman, Slovic, and Tversky 1982)—such as availability (the easier we can recall or imagine instances of an event, the more

common we judge it to be; Ruscio 2000a) or representativeness ("like goes with like"; Gilovich and Savitsky 1996) that can lead to misjudged probabilities or frequencies and the creation of superstitious beliefs. We are also strongly biased in favor of our prior beliefs and are adept at constructing post-hoc explanations (Ruscio 1998) that sacrifice historical truth for narrative truth. All of these biases, as well as many others (e.g., Kahneman, Slovic, and Tversky 1982; Nisbett and Ross 1980; Ruscio 2002), contribute to our faulty use of information relative to valid statistical formulas.

The evidence suggests that unaided human judgment cannot compete with a more mechanical process that involves a comparatively simple combination of a small handful of relevant variables. This conclusion has been supported in a tremendous number of disciplines, and includes all of the following decisions made by trained and experienced professionals (Dawes, Faust, and Meehl 1993):

- differential diagnoses of medical conditions
- predictions of the longevity of chronically ill patients
- predictions of success that lead to the acceptance or rejection of applicants to colleges, graduate programs, or jobs
- predictions of dangerousness in parole hearings
- predictions of the outcomes of sporting events used to set gambling odds
- predictions underlying financial transactions such as lending money and issuing insurance policies

When provided with identical information, statistical procedures achieve greater empirical accuracy than do professionals. This remains true when one provides professionals with information not available to the statistical procedure, and even when one provides the results of the statistical procedure itself, in which case professionals identify too many "exceptions" to the rule (Dawes, Faust, and Meehl 1989).

For half a century, there has been a concerted research effort

to find even a single domain in which clinical judgment fares as well as statistical decision making. It seems highly unlikely that holists are the heretofore undiscovered exception to this rule. I challenge holists to put their judgments to the test in a fair competition with a simple, mechanical decision-making procedure.

### Psychological Impossibilities

Holists fail to confront psychological realities. Like all other adherents to the clinical approach to prediction, holists overestimate the extent to which people can validly combine information in their heads. Holists assert that they can “take into account” a vast array of information in a complex, configural manner, ignoring the cognitive limitations of all humans.

As noted in the previous section, empirical studies have clearly established the superiority of simple mechanical combinations of data over clinical judgment. The evidence is also robust in another sense: Several different types of “mere” linear equations routinely outpredict human judges. That is, not only are equations that optimally weight information superior to clinical judgment, but so are equations that preserve only the direction of relationships—positive or negative—and weight the predictors equally (Dawes 1979). Moreover, research shows that judgments are more accurate when made from a highly limited number of valid predictors; extra information that *could* be ignored typically is not, which serves to dilute the quality of judgments (Ruscio 2000b). The demonstrated superiority of “unit-weighted” models over judges prompted Dawes and Corrigan (1974) to conclude that “the whole trick is to know what variables to look at and then to know how to add” (105). Unfortunately, holists refuse to narrow their attention to any particular variables, believing as they do that “everything influences everything else.” They also insist that a far more complex process than mere addition is necessary to understand the “whole person” or “whole chart,” despite overwhelming evidence to the contrary.

Just as the predictive failure of individual factors within the horoscope forced astrologers to retreat to the safer, more vague ground of holism, early research on the clinical-statistical prediction controversy led many people to speculate that clinical judgment would prevail at a more complex task. Unaided human judgment was acknowledged to be inferior to a linear equation when making simple decisions, but was hypothesized to be superior when the information itself was interrelated in complex ways. As in the context of holism, it was proposed that task characteristics such as configural relationships between variables—curvilinear cue-criterion relationships or cue interactions—might favor the highly trained and experienced practitioner (Meehl 1954, 1967).

Research, however, has failed to reveal the so-called “configural judge” (Goldberg 1991). This result makes intuitive sense. It is futile to presume that, although clinical judgment is demonstrably poor at the relatively simple tasks that have been studied (e.g., making decisions based on a small number of valid predictors that are all linearly related to the outcome), it will function superbly with *more complex* tasks (e.g., making decisions based on a large number of variables, each of different and questionable validity, that are nonlinearly related to

the outcome and that interact with one another to an unknown extent). If a mechanical process can eke out an advantage even with simple tasks, it will roundly best us with more complex tasks. In fact, research suggests that we are able to work effectively with up to about eight pieces of information at once (Cooksey 1996), and there is absolutely no evidence that we are capable of psychologically manipulating even this much information if it is interactive or nonlinear.

To put the final nail in this coffin, it turns out that configural judgment is seldom helpful anyway, because simpler approaches can be astonishingly potent. Dawes (1979) has argued that naturally occurring relationships between variables tend to be “monotonic.” That is, the *direction* of a variable’s effect does not typically change as it interacts with other variables. Nonlinear relationships tend to be monotonic, too. The significance of monotonicity is that simple linear models are able to capture interaction effects and nonlinear effects amazingly well.<sup>1</sup> Thus, the psychological impossibility of “taking into account” a wide range of interacting and nonlinear variables undermines a central tenet of holism, and the power of simple linear models suggests that holism itself represents a misdirected goal.

There is another psychological impossibility to consider. In their appeal to holism, practitioners claim to be able to work with an implausible number of unique configurations of information. For example, modern astrology makes a fundamentally absurd presumption regarding the number of unique horoscopes that exist. Based on a typical list of factors, Kelly (1997) calculates that there are approximately  $10^{28}$  possible horoscopes. Without providing details for her calculations, one astrologer arrived at the figure of  $5.39 \times 10^{68}$  (Doane 1956). Either way, both values undermine the justification for holism because there are far more unique horoscopes than the number of people that have ever lived! Given this fanciful premise, it is quite likely that nearly every person ever born (excepting, perhaps, identical twins) has had a unique horoscope. Therefore, an astrologer will never have met, or even read about, another person with your unique horoscope. If nobody has ever had your unique horoscope before, how could astrologers know what to predict for your future? The individual factors in your chart are the only usable information (they *are* shared with other people), but holistic astrologers cannot use these to formulate predictions—they wouldn’t be using the whole chart! The “everything influences everything else” nature of holism invariably leads to this crippling paradox.

### Justification of a Free-For-All Approach to Practice

The emerging picture of holism is one of a scientist’s curse and a charlatan’s dream. Holists imply an ability to “take into account” all relevant factors, which they cannot, and shield their lack of knowledge or skills with linguistic evasions while steadfastly refusing to state, define, assess, or integrate any specific variables at all. Such a lack of standards or guidelines based on empirical support would be debilitating to a conscientious scientist-practitioner. There is a vicious double standard in that holists, who reject the very principles that inform ethically defensible practices, enjoy a freedom from the challenging

work of developing and validating a set of practice guidelines, learning and teaching these guidelines to others, and constraining their thinking in accordance with any defensible principles at all. This "anything goes" mentality is justified on the basis of each holist's personal beliefs, biases, and inclinations. Holists' strongly implied suggestions (as on the AHVMA Web site) that their practices provide individuals seeking professional advice with better results than can well-trained scientist-practitioners is nothing short of offensive. Moreover, despite overwhelming scientific evidence against the clinical approach to prediction that holists have pushed well past its breaking point, they demonstrate an untenable adherence to it.

Meehl (1986) attributes such irrational adherence to an inferior decision-making procedure to several sources. Many individuals' unwavering belief in the efficacy of their own judgment—the pervasive and pernicious overconfidence effect (Ruscio 1998)—or in the importance of their preferred theoretical identification (as contrasted with an atheoretical statistical procedure) is a potent stumbling block. Perhaps most destructive of all is the common complaint that the use of statistical decision making can feel "dehumanizing," that it somehow denies the uniqueness of individuals. This is simply untrue. In fact, research comparing clinical and statistical prediction has involved consideration of identical information; the only issue is how best to combine it. The importance of the "feel" of a procedure pales in significance when compared with a more ethically defensible benchmark for evaluating decisions: a demonstrable track record of empirical accuracy. Meehl (1986) puts it this way. "If I try to forecast something important about a college student, or a criminal, or a depressed patient by inefficient rather than efficient means, meanwhile charging this person or the taxpayer 10 times as much money as I would need to achieve greater predictive accuracy, that is not a sound ethical practice. That it feels better, warmer, and cuddlier to me as predictor is a shabby excuse indeed" (374).

## Conclusions

Holism suffers from the serious shortcomings of the clinical approach to decision making. Unaided human judgment is simply incapable of dealing effectively with large amounts of complex information. Furthermore, there is an overstated need for configural judgment in the first place. A simple, mechanical combination of a handful of relevant variables is often sufficient to achieve the predictive power afforded by existing knowledge. Compounding the troubles of holism is its proponents' resolute refusal to offer reliable evidence that they use any consistent decision-making strategy at all. It is noteworthy that clinical judgment—let alone holistic verbiage—is rarely tolerated when large sums of money are at stake (e.g., decisions involving loans, insurance, or gambling odds). Holism is an empty retreat from reality, a method by which pseudoscientists muddy rational thought, avoid clear and concise communication, and follow their own idiosyncratic beliefs to justify doing whatever they please in the name of all that sounds nice and feels good.

## Note

1. Here's a simple but dramatic example drawn from Yntema and Torgerson (1961). Consider three factors  $i$ ,  $j$ , and  $k$ , such that each factor varies as a rectangular distribution along the integers from 1 to 7 and is completely independent of the other two factors. Within a data set of 343 cases ( $7 \times 7 \times 7$ ), let's explore two questions. First, how well do you suppose a linear model based solely on the additive main effects of  $i$ ,  $j$ , and  $k$  can predict a criterion composed purely of interactive relationships,  $(i \times j) + (i \times k) + (j \times k)$ ? The multiple correlation coefficient is .97, which accounts for 94% of the variance! Second, how well do you suppose that a linear model of additive main effects can predict a criterion composed purely of nonlinear effects,  $i^2 + j^2 + k^2$ ? The multiple correlation coefficient is .98, which accounts for 96% of the variance! Thus, given the incredible predictive power of linear models with monotonic relationships, configural judgment is neither necessary nor beneficial.

## References

- Cooksey, Raymond W. 1996. *Judgment Analysis: Theory, Methods, and Applications*. San Diego: Academic Press.
- Dawes, Robyn M. 1979. The robust beauty of improper linear models in decision making. *American Psychologist* 34: 571-582.
- . 1994. *House of Cards: Psychology and Psychotherapy Built on Myth*. New York: Free Press.
- Dawes, Robyn M., and Bernard Corrigan. 1974. Linear models in decision making. *Psychological Bulletin* 81: 95-106.
- Dawes, Robyn M., David Faust, and Paul E. Meehl. 1989. Clinical versus actuarial judgment. *Science* 243: 1668-1674.
- . 1993. Statistical prediction versus clinical prediction: Improving what works. In G. Keren and C. Lewis (Eds.), *Handbook for Data Analysis in the Behavioral Sciences: Methodological Issues* (pp. 351-367). Hillsdale, New Jersey: Erlbaum.
- Dean, Geoffrey, Arthur Mather, and Ivan W. Kelly. 1996. Astrology. In G. Stein (Ed.), *Encyclopedia of the Paranormal*. Buffalo, N.Y.: Prometheus.
- Doane, Doris C. 1956. *Astrology: 30 Years Research*. Hollywood, California: Professional Astrologers, Inc.
- Gilovich, Thomas. 1991. *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life*. New York: Free Press.
- Gilovich, Thomas, and Kenneth Savitsky. 1996. Like goes with like: The role of representativeness in erroneous and pseudoscientific beliefs. *SKEPTICAL INQUIRER* 20(2), March/April: 34-40.
- Goldberg, Lewis R. 1991. Human mind versus regression equation: Five contrasts. In D. Cicchetti and W.M. Grove (Eds.), *Thinking Clearly About Psychology* (Vol. 1, pp. 173-184). Minneapolis: University of Minnesota Press.
- Grove, William M., David H. Zald, Boyd S. Lebow, Beth E. Snitz, and Chad Nelson. 2000. Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment* 12: 19-30.
- Kahneman, Daniel, Paul Slovic, and Amos Tversky. 1982. *Judgment Under Uncertainty: Heuristics and Biases*. New York: Cambridge University Press.
- Kelly, Ivan W. 1997. Modern astrology: A critique. *Psychological Reports* 81: 1035-1066.
- . 1998. Why astrology doesn't work. *Psychological Reports* 82: 527-546.
- Meehl, Paul E. 1954. *Clinical vs. Statistical Prediction: A Theoretical Analysis and a Review of the Evidence*. Minneapolis: University of Minnesota Press.
- . 1967. What can the clinician do well? In D.N. Jackson and S. Messick (Eds.), *Problems in Human Assessment*. New York: McGraw-Hill.
- . 1986. Causes and effects of my disturbing little book. *Journal of Personality Assessment* 50: 370-375.
- Nisbett, Richard E., and Lee Ross. 1980. *Human Inference: Strategies and Shortcomings of Social Judgment*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Ruscio, John. 1998. The perils of post-hockery. *SKEPTICAL INQUIRER* 22(6), November/December: 44-48.
- . 2000a. Risky business: Vividness, availability, and the media paradox. *SKEPTICAL INQUIRER* 24(2), March/April: 22-26.
- . 2000b. The role of complex thought in clinical prediction: Social accountability and the need for cognition. *Journal of Consulting and Clinical Psychology* 68: 145-154.
- . 2002. *Clear Thinking with Psychology: Separating Sense from Nonsense*. Pacific Grove, California: Wadsworth.
- Van Rooij, Jan. 1994. The whole chart and nothing but the whole chart. *Correlation* 13: 54-56.
- Yntema, Donwe B., and Warren S. Torgerson. 1961. Man-computer cooperation in decisions requiring common sense. *IRE Transactions of the Professional Group on Human Factors in Electronics*. HFE-2: 20-26 □