

Two Paradigms for Clinical Science

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The concept of psychologist as clinical scientist has found increasing support in recent years from diverse corners of professional psychology. Yet differences in how these advocates understand the nature of clinical scientific practice persist, fueled by philosophical differences over the nature of knowledge. Two epistemological paradigms that are the center of much discussion in contemporary philosophy are briefly explained: internalism vs. externalism. Modern clinical psychology has emerged largely within an internalist theory of knowledge. While psychologists have discerned important features of how one obtains knowledge in a clinical setting, it is argued that these discoveries are better positioned in an externalist epistemology. The implications of externalist clinical science for a number of relevant topics are discussed including: whether there is, or should be, a normative scientific method, the role of clinical judgment as a source of knowledge, and how science can be demarcated from pseudo-science without presupposing a methodological hegemony.

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It has been over a half a century since the Boulder Conference explicitly endorsed a vision of the professional psychologist that incorporated both a practitioner and scientific identity but without a clear view of how to merge these two identities (Raimy, 1950). How successful has the “educational experiment” advocated by the Boulder conferees been in fostering a profession that merges science and practice? This has been a point of much discussion and contention over the ensuing years. Interestingly, there have been recent calls from both Boulder (scientist–practitioner) and Vail (practitioner–scholar) model advocates to re-emphasize the core identity of the clinical psychologist as a “clinical scientist” (McFall, 1991; Peterson, Peterson, Abrams, and Stricker, 1997). However, varying assumptions about the nature of clinical knowledge and scientific epistemology have contributed to ongoing confusion and dis-

cord over how this should be accomplished (McFall, 2000; Peterson and Peterson, 1997).

Psychologists as Clinical Scientists

Clinical Psychology in Light of the Training Models

The self-understanding of clinical psychology as a profession has been reflected in the various training models that have been advanced for the field (Hoch, Ross, and Winder, 1966; Korman, 1976; Peterson, 1997; Raimy, 1950; Shakow, 1978; Trierweiler and Stricker, 1998). From its earliest days as a recognizable discipline, some dual emphasis on both scientific scholarship and clinical practice has characterized clinical psychology (Witmer, 1907/1996). Although there was debate even at the 1949 Boulder Conference about whether students could really be trained competently in both roles, in the end the scientist-practitioner model of clinical training prevailed (Raimy, 1950).

The years following Boulder saw numerous attempts to expand, define, refine and alter various aspects of the clinical training model and identity that was epitomized by Boulder (Korman, 1976; Peterson, 1997). Criticisms emerged that Boulder-model programs insufficiently trained practitioners in clinical practice skills (Peterson, 1997), emphasized less relevant forms of laboratory research methods over more naturalistic or field-based strategies (Stricker and Trierweiler, 1995), were too dependent on the medical model (Albee, 2000), and often produced little research that actually informed clinical practice in meaningful ways (Beutler, Williams, Wakefield, and Entwistle, 1995). Defenders of the Boulder model claimed that the ideal of a scientist-practitioner has rarely been achieved and still awaits meaningful instantiation (Nathan, 2000).

The emergence and increasing acceptance of professional school programs has contributed to a “. . . more catholic and comprehensive view of clinical psychologists” (Shakow, 1978). The 1973 Vail Conference explicitly endorsed the professional program approach to training clinical psychologists as a viable alternative heuristic for such training (Korman, 1976). Consequently, the Vail model, the Doctor of Psychology degree, and practitioner or practitioner-scholar programs have often been linked together. A distinction has sometimes been made between Ph.D., scientist-practitioner, programs as trainers of “producers of research,” and Psy.D. programs as trainers of “consumers of research” (Belar, 2000). But there have been efforts to differentiate the training models on grounds other than the mere relative priority given to research and practice (Peterson, 1997). Many advocates of professional programs have continued to emphasize some form of a commitment to clinical science. Vail itself supported the Psy.D. model “. . . without abandoning comprehensive

psychological science as the substantive and methodological root of any educational or training enterprise in the field of psychology . . ." (Korman, 1976, p. 19). More recently the National Council of Schools of Professional Psychology (NCSPP) re-emphasized that research is an integral part of clinical psychology: "Professional activity is not the application of knowledge from scientific research, it is a form of science and, indeed, a form of research The properly trained professional psychologist is a scientist in the sense that the skilled physician is a local clinical, biological scientist and the skilled engineer a local physical scientist" (Peterson, Peterson, Abrams, and Stricker, 1997, p. 5). The NCSPP model thus construes clinical psychology as a field science.

Clinical Psychologist as Clinical Scientist

In his Presidential address to the Society for a Science of Clinical Psychology (APA Division 12, Section III), Richard McFall (1991) argued for a model of clinical psychologists as clinical scientists who integrate science and practice around a cardinal principle that "scientific clinical psychology is the only legitimate and acceptable form of clinical psychology." A corollary of this principle is that "psychological services should not be administered" until they are first supported by an adequate base of empirical research (McFall, 1991).

McFall's manifesto clearly echoed other calls for a clinically relevant science. It also heralded the empirically supported treatment debate that has increasingly occupied clinical psychology since the 1990's (APA Division 12, 1995; Barlow, 2000; Nathan and Gorman, 2002). McFall (2000) later clarified that the intent of the manifesto was merely to "distinguish between the present standards of practice in psychology and the standards of practice that would prevail if our actions were guided by the highest scientific and ethical principles . . ." (p. 6). McFall explained his view of scientific epistemology as a "general perspective with a related set of methods, which if applied consistently and conscientiously, increases our chances of homing in on 'truth'" (p. 7). He listed four competencies that differentiate "applied clinical scientists from nonscientists and technicians" (p. 15). The first three of these are competencies particularly associated with a clinical researcher role: being guided by relevant scientific literature, competence in quantitative reasoning and measurement, and clinical outcomes research competence. The fourth involves theoretical and methodological competencies associated with specific clinical problems.

On McFall's (1991, 2000) model, the clinical scientist is an individual whose practice is delimited by empirically supported concepts/techniques. This approach can be seen as representing the "hard line" empiricist view of clinical science (Levant, 2004; Peterson, 2004). It is used here to illustrate internalism in clinical psychology. McFall's model appears to largely reflect

an epistemology that is both neo-positivist and foundationalist. While most psychologists will need little introduction to positivism, the philosophical category of foundationalism may be less familiar. Classical or radical foundationalists believe that all knowledge must be built up in a specific way from a foundation of beliefs that are somehow certain (Alston, 1976). Classical foundationalists have proposed various models of what counts as these *certain*, basic beliefs (e.g., indubitability, self-evidence, proportionality of belief to sensible evidence). Non-basic beliefs are then supported by their relationship to the basic beliefs. Positivism is a subspecies of foundationalism in which one attempts to build up a body of knowledge on the foundation of empirical data. Positivists emphasize empirical grounding as the *sine qua non* of knowledge. The goal of positivism is to “use sensory evidence as the only secure basis for knowledge and even meaning, thus rendering illicit and even meaningless the (metaphysical) reference to mind-independent reality” (Moser, Mulder, and Trout, 1998, p. 109).

While this may appear to be a straightforward and reasonable posture to many psychologists trained in scientist–practitioner programs, it is not unproblematic. At a philosophical level, classical foundationalism has received intense criticism from various directions. A general problem for any version of classical foundationalism is the unmet challenge of giving a non-circular justification of the foundational beliefs from which other beliefs are to be inferred (Plantinga, 1992). Attempts to justify foundational beliefs with certainty typically, or perhaps inevitably, result in an infinite regress of justification (Alston, 1976).

Additional problems arise for positivistic forms of foundationalism. A substantial part of the positivistic strategy, following Hume, was to eliminate as meaningless all beliefs that could not be verified through observation. Yet even this centerpiece of logical positivism, known as the *verification principle*, was soon recognized as untenable by the positivists because there was no empirical way to prove the verification principle itself (Ayer, 1936/1952; Moser, Mulder, and Trout, 1998). Furthermore, the verification principle seemed too strict in practice, requiring many common scientific constructs, such as subatomic particles, to be treated as meaningless fictions (Hacking, 1983). Numerous other criticisms of positivism have been cogently advanced by post-empiricist philosophers of science, such as Thomas Kuhn (1970). Anti-positivist critics have pointed out the way in which scientific theories are underdetermined by empirical data, on the one hand, and the theory embeddedness of observations on the other (Polkinghorne, 1988, 2004). Popper (1979) objected to the confirmationist strategy of positivism on logical grounds. He argued that scientists commit the logical fallacy of affirming the consequent when they attempt to reason backwards from observed predictions to a proof of the theory from which the theory was drawn.

In the wake of mounting criticisms of empiricist science, others have argued for a more methodologically and epistemologically diverse clinical science (Peterson and Peterson, 1997; Peterson, Peterson, Abrams, and Stricker, 1997; Trierweiler and Stricker, 1998). They have advanced a model of professional psychology as local clinical science. Trierweiler and Stricker (1998) view practitioners as “. . . critical investigators of local (as opposed to universal) realities who are knowledgeable of research, scholarship, personal experience and scientific methodology. They also are able to develop plausible, communicable formulations for understanding essentially local phenomena using theory, general world knowledge including scientific research, and, most importantly, their own abilities as skeptical scientific observers” (p. 6).

The Trierweiler and Stricker (1998) model is directed to the local context as opposed to universal or general. The context of practice is local in at least four senses: particular applications of general science, encounter with local cultures, local as the unique or idiosyncratic, and local as situated in a specific space–time location. The authors suggest that three broad skill areas are relevant to such practice contexts: attitudinal skills, critical thinking, and methodological skills. The local clinical scientist has a “discerning, empirical and open” attitude. She is proficient in critical thinking skills and technical or methodological skills honed for particular fruitfulness in the clinical context.

It is noteworthy that both McFall (1991, 2000) and Trierweiler and Stricker (1998) point out the need for focused scientific competencies in specific clinical practice areas. Competent clinical practitioners are therefore to be competent clinical “field” scientists. This conceptualization can be traced back to the founding of clinical psychology. Witmer (1907/1996) coined the name “clinical psychology” for this area of applied psychology and outlined its distinctive clinical method in ways that still resonate with current paradigms for the discipline. As a clinical science, Witmer believed that clinical psychology would not only apply laboratory psychology to the clinical setting but would also augment laboratory psychology with theory and methods inspired by the clinical setting. Thus Witmer’s pioneering proposal implied that clinical psychology would be a field science. Fieldwork is common in many sciences including the pure sciences such as physics or chemistry (Kuklick and Kohler, 1996). But fieldwork is the primary form of science for disciplines such as archeology, earth science or applied medicine. Consequently, scientists from these disciplines have emphasized the distinctive features of field science (Wolcott, 1995).

Field science is not merely “applied” science. It is overly simplistic to dichotomize science into its pure or basic form and its applied form (Johnson and Hathaway, 2004). Such an account presupposes that the “real” science is to be found in basic research. Applied science is simply the application of standard basic research strategies, skill sets or findings to some concrete

human concern. Field scientists often have to extend basic science in novel ways and frequently create their own repertoire of techniques, constructs and approaches tailored specifically for their particular field settings. This is true even in the natural sciences. The theoretical laws of physics do not generalize directly to field settings because the real world often differs from the controlled conditions under which they were discovered. For example, Snell's law predicts that the angle of refraction of an energy wave through a medium will be a constant ratio to the angle of incidence. But this holds true only if the medium is homogenous which rarely occurs in nature. Cartwright (1983) provided numerous such examples to illustrate that the laws of physics "lie" with respect to the typical operation of the natural world. She notes that engineers and other applied scientists have developed their own reference books based on summaries of their applied experiences with materials in various natural settings. The books contain rules of thumbs or "fudge factors" to make adjustments for the confounding impact of the uncontrolled environment that exists outside of the lab. Thus field sciences do not constitute the mere extension of lab science to the applied setting but instead represent their own creative domain of scientific activity.

Trierweiler and Stricker's (1998) conception of clinical science is consonant with this robust notion of field science. They desire to preserve the value of the quantitative-empiricist tradition. But they also embrace epistemic contributions from idealist and sociocultural/constructionist approaches to science. They argue for a somewhat eclectic posture that assumes the "three overlapping trajectories" in philosophy of science are all "important for any inquiry" (p. 59). Their model continues to advance a clinical science characterized by clinical psychology's traditional core training in the quantitative, measurement tradition of individual differences psychology. Yet they want to simultaneously embrace the sort of qualitative investigatory skills associated with the humanities and ethnological disciplines (Polkinghorne, 1988).

How can the heterogeneous set of practices that fall within the scope of Trierweiler and Stricker's (1998) model be construed as a coherent science? When would it be reasonable to assume that a mere synthesis of these convenient but diverse conceptions of science would produce clinical knowledge? McFall (1991, 2000) appeals to an empiricist vision of science to justify his model of clinical science. The meta-epistemological justification for the Trierweiler and Stricker eclectic account is less clear. The authors acknowledge this challenge: "The problem of relative significance to be assigned to good ideas, empirical information, and consensus-generating operations remains to be solved" (p. 57). The tension between the empiricist and post-empiricist accounts of clinical science may be aggravated by a set of background assumptions which have contributed to the epistemic weaknesses noted in both. The characterization of, and debate over, this set of assumptions has become

a central focus in contemporary philosophy of knowledge. A brief digression into this philosophical discussion can contribute to psychology's ongoing dialogue over the nature of clinical science.

Two Paradigms in Epistemology

Modern professional disciplines, such as contemporary clinical psychology, have evolved within the context of a particular epistemological paradigm that has been described as internalism (Alston, 1989; Bergman, 1997, 2000; Bernecker and Dretske, 2000; Bonjour and Sosa, 2003; Greco, 2000; Kim, 1993; Kornblith, 2001; Plantinga, 1992). Internalism has been the predominant approach to epistemology since the Enlightenment, subsuming many of the defining characteristics of modernism including: an emphasis on justification of beliefs, a search for highly certain foundations upon which to build up our body of knowledge (classical foundationalism), and a portrayal of the knowledge process as involving duties for the knowing agent (epistemological deontologism). Internalism holds that one has knowledge only when beliefs are supported in some truth guaranteeing way evident to the knower's consciousness. For instance, if I have a belief that it is noon, this belief will constitute knowledge only if I am aware of some grounds for the belief that guarantee its truth. By some lucky coincidence, it may turn out to be true that it is actually noon when I believe it to be noon. But unless I can justify this belief on the basis of some truth guaranteeing grounds which are directly accessible to my consciousness, the internalist would deny that my true belief counts as *knowledge*.

Externalism represents a paradigm shift from internalism. Bernecker and Dretske (2000) explain that the

. . . distinction between externalism and internalism is the most widely used distinction in contemporary epistemology, one that has been applied both to accounts of justification and to accounts of knowledge. In its broadest formulation, internalism about epistemic *justification* is the view that all of the factors required for a belief to be justified must be cognitively accessible to — already known or experienced by — the subject and thus internal to her mind. Externalism about justification is the view that some of the justifying factors may be external to the subject's cognitive perspective. Some of the facts that make a true belief into knowledge may be unknown — indeed, unknowable — to the knower. (p. 65)

Externalism views knowledge as the result of a causal relation between the knower and that which is known. When some aspect of the world impacts our knowing faculties in a way that produces reliable true beliefs about the world, knowledge is achieved. So my belief that it is noon could count as knowledge even if I am not aware of any particular way to justify that belief. All that would be required is that my belief about the time of day be the

result of some belief forming process that produces reliable, true belief in just such a case. If my belief is the outcome of this sort of reliable belief producing process then it would count as knowledge even if I am not personally aware of how the process operates.

Externalist accounts of knowledge have received increasing attention in the philosophical literature since the mid 1980's (Alston, 1989; Goldman, 1967, 1987, 2002; Plantinga, 1992). The dominant motifs of externalism have been reliabilism, the causal theory of knowledge, and fallible realism (Bernecker and Dretske, 2000; Goldman, 2002; Greco, 2000). Reliabilism asserts that knowledge is merely the output of reliable belief formation processes that function to form true beliefs. Furthermore, the belief formation process must operate in such a way that true beliefs are not formed accidentally but rather in some manner that is causally dependent upon the facts about the world that make the beliefs true (Bernecker and Dretske, 2000; Plantinga, 1992). A common metaphor for externalism is the view of knowledge formation as analogous to the way a good thermometer tracks temperature (Armstrong, 1973). A good thermometer will register changes in temperature in a manner that is linked to objective changes in the environment. But suppose someone has a broken thermometer, which gives a constant reading of 60°. It is likely that this temperature reading will just happen to be true on some occasions, namely, when it is really 60°. Yet we would not call this a *true* reading of the temperature because the reading is not causally dependent on the temperature. In the same way, not all *true* beliefs are knowledge. For the externalist, beliefs must not only be true but must also be the result of a reliable causal relationship to that which is known in order to count as knowledge (Goldman, 1967, 1986).

Yet the externalist does not assert that every cognitive process is aimed at producing truth. For instance, some cognitive processes may operate for protective functions or wish fulfillment. Such processes may be properly functioning but will not reliably result in true or verisimilitudinous beliefs. Since our cognitive faculties may be designed to achieve many things besides true beliefs, only those beliefs produced by cognitive faculties, which are functioning in a manner that is causally dependent upon the facts to be known, can count as knowledge (Plantinga, 1993).

A further condition is also relevant to the production of knowledge: knowledge producing processes have to be operating in an environment conducive to their reliable and truth approximating functioning. Even a good mercury thermometer will fail to produce true temperature readings in an environment in which mercury freezes. In what type of knowing situations do human cognitive faculties reliably produce true beliefs in response to objective features of the world? It is here that a key difference between internalism and externalism manifests itself. The internalist would typically insist on explicitly delimiting those specific criteria or situations that would justify

a belief as knowledge in advance of admitting any knowledge claims. In contrast, the externalist would typically see the development of epistemic standards, scientific or otherwise, as an a posteriori discovery to be achieved through examination of actual knowledge production examples. Thus externalists “. . . regard epistemology as largely . . . empirical, and look to empirical psychology for a characterization of how our belief-forming processes function” (Moser, Mulder, and Trout, 1998, p. 89).

Clinical Psychological Science and the Two Knowledge Paradigms

Significant differences in the conceptualization of clinical science can be anticipated based on the distinction between internalist and externalist clinical epistemology. The two knowledge paradigms lead to different understandings of normative scientific method, attitudes toward clinical judgment, and potentially to different ways of demarcating science and pseudoscience.

Normative Scientific Method: Is There a Right Way to Do Science?

Internal epistemologies are primarily deontological and prescriptive. They assert there is a *particular* way, or a rather restricted set of ways, to do science. Any scientific endeavor that fails to live up to the standard would cast doubt on the certitude of its conclusions. Furthermore, the knowing agent in such a case would be acting in an epistemically blameworthy manner. It is no accident that McFall (2000) connects deviations from empirical scientific epistemology in clinical practice with ethical violations at several points. I am citing McFall here only to illustrate the form an internalist deontological (e.g., duty oriented) emphasis can take. I am not sure to what extent McFall's views are widely represented among practicing clinical psychologists today. Still the internalist motifs reflected in his perspective do have an early lineage in contemporary psychology. Consider the following statements from Raimy's (1950) official report of the Boulder Conference:

The clinical psychologist ordinarily functions in a social setting in which abstract ideas cannot be debated at all times, but where practical decisions must be reached by a number of persons with differing backgrounds and skills. Realization of the need for adaptability should, in the long run, free the clinical psychologist from feelings of guilt over the “unscientific” demands of clinical psychology, if at the same time he has had the opportunity to learn how to analyze personality concepts in terms of their systematic implications. There cannot be overindocination in the scientific attitude. There can be an illusory oversimplification of the problems faced by the clinical psychologist who is also scientist. (p. 86)

Notice the deontological overtones present in this passage. Clinical psychologists can be free “from feelings of guilt” over the unscientific demands of prac-

tice, provided that they fulfill their epistemic obligations as much as possible in the clinical context. Perhaps not surprisingly, duty-oriented philosophies tend to value clear-cut standards that guide or constrain action. In scientific epistemology, this emphasis amounts to a pre-specified and forcefully defended way of doing science. Although it is possible to allow for pluralism of method within an internalist clinical science, it runs against the grain of such a perspective. Consequently, there is a tendency to move toward either a methodological hegemony, in which a single scientific method is prescribed, or a methodological hierarchy, in which a set of methods are arranged from better to less adequate. In the latter case, the preference is always to use the best method possible in a concrete situation.

Externalist epistemology differs substantively from the a priori foreclosure on knowledge production typifying internalism. Externalist scientific standards are primarily descriptive and a posteriori. They are discovered by a critical community of scientific investigators in response to generalizations drawn about actual examples of scientific knowledge. It would be very strange for an externalist to say in advance, "science can only ever be done this way," or "there's no point in even considering those claims to knowledge because they were not produced according to this method." The primary question for the externalist would be, "Is this sort of knowing process capable of reliably producing beliefs about the world when those beliefs are true, and of dispelling such beliefs when false?"

Consider again Trierweiler and Stricker's (1998) account of local clinical science. What would an externalist request of such an account? Mainly, that it be demonstrated to result in reliable and valid knowledge about the world. Now this runs counter to positivistic attitudes in clinical psychology which assert that it is inappropriate to talk about the *real* world as the direct subject matter of our scientific knowledge (Stanovich, 2004). Externalists often argue that such metaphysically squeamish thinking is fundamentally wrongheaded and no longer necessary, given the failure of internalism to prove its case (Trout, 1998). Further, the externalist argues that it is precisely the relation between the real world and a scientist's belief-forming processes that constitutes knowledge.

Although Trierweiler and Stricker (1998) do not explicitly describe their model in externalist terms, they clearly express several externalist motifs:

... the realist perspective most adequately describes our interest in pulling the threads of method and purpose out of philosophical inquiry for application in the local clinical realm. Among other things, the realist perspective underscores the need to be sensitive to the culture of science as well as to the empirical realities that science seeks to understand. (p. 58)

Still further they assert,

The local clinical scientist, as a professional measuring instrument, needs to be affected by whatever structure exists in nature without being overwhelmed, forced into too narrow strains of certainty, or too loosely connected with the enduring properties of events in space–time. (p. 68)

So here Trierweiler and Stricker (1998) articulate a fairly straightforward externalist account, without labeling it as such. What is missing in their account, from an externalist perspective, is a factual appeal to actual examples of reliable knowledge formation using the methodologically and epistemologically diverse clinical science they advocate. Here the externalist would be sympathetic to McFall's (2000) concern to show the incremental validity for our theories.

With regard to the role of empirically supported treatment protocols and clinical practice, Soldz and McCullough (2000) note:

Psychotherapy practice, involving as it does a complex interpersonal relationship, cannot be reduced to the application of research findings any more than the construction of a house involves simply knowledge of the materials to be used to construct the house. However, practitioners and their clients cannot afford to ignore the growth of knowledge in psychology in general and psychotherapy research in particular. After all, medicine has taught us that much of clinical wisdom is, in fact, incorrect. One need only think of the enormous number of tonsillectomies that used to be conducted in the not-too-distant past. Systematic research is . . . the best process for winnowing truth from plausible, but ultimately false belief. (pp. 7–8)

The externalist would have little difficulty with such a statement unless “best process for winnowing truth” was understood as an a priori, timeless absolute. It may be that systematic, quantitative–empirical research is the best truth-discerning method available, to date, in clinical science. But this would be a contingent fact that could change if other reliable and valid forms of knowledge production were demonstrated.

As a naturalistic epistemology, the externalist position does not presuppose any particular epistemological strategy to be the royal road to knowledge (Quine, 1969). Rather externalism defers to the inductive analysis of successful scientific inquiry to determine local standards, models and accounts of effective knowledge production methods for the clinical context. It may turn out, in fact, that only quantitative–empirical methods of certain types result in reliable production of clinical knowledge. Externalism provides no guarantees out of the gate that this will be the case. It is conceivable that reliable belief-producing processes may be possible utilizing qualitative and narrative inquiry strategies (Creswell, 1998; Kuenning, 1997). Externalists would expect that any proposed human science methodology display reliable knowledge produc-

tion for whatever sorts of true beliefs they are aimed at producing if that methodology is to become accepted by the community of scientists. This performance expectation would not be used as an initial acceptance barrier for innovative approaches to clinical discovery. Rather a failure to demonstrate a track record of reliable knowledge production over time would be grounds for rejecting the methodology after it is given an opportunity to prove itself.

Yet it should also be noted that nothing in the externalist account precludes the possibility that standards for discerning truth may develop in a community of practice. An externalist set of standards will evolve in reciprocal response to examples of knowledge, as a community of knowers achieves them. Thus externalism does not support a commitment to the internalist precondition for knowledge in the developing standards (i.e., that only those things that are first justified according to some standard should be believed). Externalist standards can be expected to function more as a tool to defeat faulty beliefs or to help place the knowing subject in a useful relation to his or her environment that is more likely to result in the production of true beliefs. Because no single epistemic "method" seems to capture the richness of the human knowing process, it would not be surprising if inductively derived standards end up being pluralistic and mutable. Leplin (1997) emphasizes this reciprocal enrichment between scientific standards of inquiry and reflection on new examples of knowledge claims in the sciences:

The evidence that is appropriate for the acceptance of a new scientific theory is the strongest evidence that can foreseeably be obtained on the assumption that the theory is correct If a new theory's empirical claims, in conjunction with established background theory, render existing standards of evaluation inapplicable, then these standards will adjust sufficiently to provide for the possibility of favorable evaluation. In short, the new theory will be given at least a fighting chance. (pp. 183–184, italics in the original)

If Leplin is correct, the scope of possible scientific claims are not limited a priori by the methodologies commonly accepted in an area of science. Yet certain methodologies for producing scientific beliefs may become suspect when they display a track record of unreliable epistemic performance. The controversy in clinical psychology over the validity of clinical judgment illustrates how the externalist models of science may differ from internalist ones.

Role of Clinical Judgment

Internalist and externalist clinical science differ over their initial openness to the validity of clinical judgment. Meehl's (Grove and Meehl, 1996; Meehl, 1986) well known critique of clinical judgment has inspired hundreds of studies comparing the accuracy of clinical predictions to actuarial predictions generated from statistical prediction rules. The clear preponderance of the data

from these studies supports Meehl's early assertions that actuarial predictions outperform clinical predictions, at least with regard to discrete, quantifiable outcomes (Bishop and Trout, 2004; Garb, 1998; Grove and Meehl, 1996; Meehl, 1986; Trout, 1998). Inspired by this research tradition, McFall (2000) stated:

The problem with knowledge claims based on "personal clinical experience" is that these represent subjective or "intuitive" knowledge that typically is not stated explicitly, and so its validity cannot be tested. This is why such claims are viewed skeptically within a scientific epistemology Clinicians who offer services for which there is no good scientific evidence of validity are violating both the logical and ethical tenets of scientific clinical psychology. They are "winging it," which is unacceptable. They may argue that their services are backed by "clinical experience," that their treatments are consistent with "routine and accepted practices," or that, at a minimum, their services yield placebo effects or offer clients "hope." But none of these justifications for "business as usual" satisfies scientific standards. (pp. 7-11)

The problem with this account is that McFall (1991, 2000) has not provided compelling reasons to reject clinical judgment en masse. Consider the more accommodating view offered by Beutler (2004):

. . . in the absence of scientific data on a subject . . . a good clinician should and can rely on her experience and judgment. This is proper. But when research is or does become available, it is well for one's "judgment" to change to accommodate it We are better clinicians if we remember that we are by nature, error-prone measurement devices To elevate even the best clinical judgment to the status of knowledge, rather than hunch, is not wise (pp. 227-228)

Beutler pragmatically acknowledges that clinical judgment must appropriately fill in until "scientific data" can replace it. While he does not make his rationale for this judgment fully explicit, he references the error-proneness of humans as "measurement devices." In light of his preliminary accommodation of clinical judgment, Beutler's claim that such judgment does not constitute knowledge is likely problematic. On an externalist account, a belief fails to be knowledge if it is produced through a pathway that lacks any reliable connection to reality (Goldman, 2002). Consequently, if clinical judgment is devoid of knowledge as Beutler suggested, then guiding one's practice by it would be to practice in a manner indifferent to reality.

Yet externalism also points to a way that Beutler's point might be made without reducing clinical judgment to a capricious activity. Externalism is predicated upon a "fallible realism" which holds that knowledge can come in degrees (Kaufman, 2002). I may know it is more humid today than yesterday just by walking outside, trusting my immediate senses and memory. Assuming that the processes that produced my current perception and memory of humidity tracked the actual humidity to a sufficient degree to allow a valid comparison, then my belief constitutes knowledge. However, if I had

recorded measurements of the humidity from a well-calibrated hygrometer, then I could likely make a superior comparison of the relative humidity on the two days. Perhaps Beutler's point can be restated as the assertion that clinical judgment may provide some degree of knowledge in particular cases but in a way that is typically inferior to actuarial prediction or other research generated quantitative decision strategies.

McFall's and Beutler's comments both appear to suggest that a clinician can simply choose to replace her clinical judgments with alternative beliefs in the presence of appropriate empirical data. Yet externalists typically deny that individuals can choose what they believe. Belief *happens* in response to the world we experience (Plantinga, 1992, 1993). Clinicians do not choose their beliefs. Rather they believe what they believe about their clients. Do we really want mental health professionals to believe a certain thing about a client, perhaps that the client might be hiding suicidal intentions, and then to fail to act on that belief? How could such inaction be ethical?

Suppose Meehl's views on actuarial vs. clinical judgment continue to prevail. Consequently, clinical scientists increasingly hold that human cognitive faculties do not operate to produce true judgments under a range of circumstances in which clinicians often find themselves. For the sake of illustration, let us assume that clinician judgments reflect a systematic biasing error in the direction of over-pathologizing because of financial pressures to diagnose. Does this mean that clinical judgment would never be warranted? No. As Plantinga (1993) has noted, "suppose I *know* that the environment is misleading; and suppose I know in just which way it is misleading . . . I can compensate for my erroneous tendency. What counts, of course, are uncorrected and uncompensated malfunctionings" (p. 11). Warrant need not be viewed as an all or nothing quality. It can come in degrees: ". . . many of my visual beliefs may constitute knowledge even if my vision is not 20/20. Similarly, my faculties can function *properly* even if they do not function *ideally*" (p. 10).

An internalist would have us limit our clinical judgments and other practice patterns to those beliefs that we first support scientifically. But this is just not feasible or necessary. Consider the vast range of the background beliefs that influence clinical practice during the course of the day. "An appropriate progress note for this client is this long." "These sorts of things should be in the note." "I should open the session with this type of client in this way." "In this cognitive disputation, I should focus on this belief first rather than that one." Even if such beliefs could or have been addressed through research, it is unlikely that the research findings will generalize to all of the concrete cases in which the clinician must make a judgment. Even when one attempts to apply an empirically supported treatment protocol with a high degree of compliance, there will be idiosyncratic judgments that occur in the application process, relating the protocol to the concrete and particular client before the clinician.

So how might science inform and structure clinical judgment on an externalist account? Not by serving as a precondition for any belief or practice activity. Rather, by influencing the formation of beliefs in a more reliable and truth-approximating direction. Consider the case of recovered memories (Loftus and Polage, 1999). This controversial area of practice appeared to result in part from clinical judgment operating with far too little sensitivity to factors that contribute to erroneous judgment. Clinicians, informed about the malleability and suggestibility of memory, can become more attuned to circumstances which might cultivate false memories and can adjust their practice patterns accordingly. Of course, a clinician may choose to ignore the research data in favor of his "clinical experience." But given the body of evidence suggesting the invalidity of such recovered memory techniques and the potential for client harm that might result, such a course would seem unwise. Similar concerns could be raised over ill-formed clinical judgments in areas such as predicting dangerousness or child custody determination. Clinicians who persist in forming clinical judgments through unreliable and invalid techniques have been insufficiently conditioned in their professional formation to be appropriately sensitive to evidential correction.

Although the externalist would have no a priori reason to reject the dictates of clinical intuition, she would be quite concerned about those factors that are shown, by investigation, to compromise the accuracy of judgment. The goal of externalist clinical science would be the calibration and augmentation of human judgment and belief formation for improved reliability and accuracy in the clinical domain. Garb's (1998) review of the implications of the human judgment literature for clinical assessment would certainly be relevant to such a project. After evaluating much of the judgment research he makes the following recommendations for improving clinical assessment:

- (a). attend to empirical research; (b). be aware of, and overcome, cultural biases;
- (c). describe clients' strengths; (d). be wary of some judgment tasks; (e). be systematic and comprehensive when conducting interviews; (f). make use of psychological tests and behavioral-assessment methods; (g). use cognitive debiasing strategies; (h). follow legal and ethical principles; (i). use scientific standards; and (j). use decision aids. (p. 247)

The professional training challenge will be to actually cultivate clinician practice habits to achieve this sort of calibrated judgment.

An important qualification should be made at this point. I have maintained the framing of the discussion as provided by Meehl. The research tradition inspired by Meehl's opposition of actuarial and clinical judgment has focused on the accuracy of predicting quantitative, measurable outcomes. The recent emphasis on the relevance of moral discourse and narrative self-understandings to clinical practice may require a reframing of the debate (Miller, 2004; Polkinghorne, 2004). When qualitative judgments are being made that do

not imply quantitative outcomes, the research on clinical judgment has less to say. The challenge for the proponents of the qualitative strategies, sometimes identified as the human science approach, is to demonstrate that such an approach can result in reliable knowledge production in its domain of inquiry. An externalist should not stipulate any a priori requirement for the human science approaches to provide quantitative outcome support for their knowledge claims. On the other hand, if a human science methodologist uses clinical judgment or narrative interpretation to make quantitative-causal claims about the clinical realm, then it seems reasonable to expect commensurate quantitative demonstration of the reliability of the proposed knowledge pathway.

Science vs. Pseudo-Science

Another potential difference between internalist and externalist accounts of clinical science may arise over the demarcation of science from pseudo-science. One of the cornerstones of the positivist tradition has been to attempt to formulate a set of criteria that distinguishes true scientific subject matter from “non-sense” (Ayer, 1936/1952). This led to various versions of the ill-fated verification principle. While the positivist verificationist proposal was soon abandoned, the ideal of a demarcation principle was preserved in Popper’s (1979, 1956/1983) falsificationism. On Popper’s view, hypotheses are counted as scientific only if they are capable of refutation. Stanovich (2004) applies Popper’s view to psychology: “Scientific theories must always be stated in such a way that the predictions derived from them can potentially be shown to be false” (p. 24). Why is falsifiability important? Because human knowledge is fallible we will not be able to move beyond our illusions if we cannot subject our beliefs to refutation (Popper, 1956/1983). As Stanovich (2004) explains: “. . . if a theory does not rule out any possible observations, then the theory can never be changed, and we are frozen into our current way of thinking, with no possibility of progress” (p. 20).

This emphasis on putting our beliefs to risky tests as a hallmark of scientific inquiry was articulated already in the sixteenth century by Francis Bacon. Urbach (1987) notes:

The tendency to overlook unfavorable evidence, or to reinterpret it so that a pet theory is forever immunized against criticism, is a characteristic weakness of many of the disciplines which Bacon regarded as inadequate and which, he believed, poised a serious danger to science. (p. 97)

How might an externalist view Popper’s falsificationist principle? Rather than emphasizing falsifiability as a quality of hypotheses, an externalist might be more sympathetic to a view of falsifiability as a type of relation between an object of knowledge and a knower (or knowers). Gardner (2001) notes that

To Popper's credit he was, like Russell, and almost all philosophers, scientists, and ordinary people, a thoroughgoing realist in the sense that he believed the universe, with all its intricate and beautiful mathematical structures, was "out there," independent of our feeble minds. (p. 14)

Scientific inquiry is characterized by the investigator placing her beliefs in a position of increased vulnerability to counterevidence, such that, if false, the beliefs are more apt to be rejected over time (Bergmann, 1997, 2000). There is a subtlety in externalism which is relevant to this point. Bergmann (2000) argues that externalism holds that "*a subject knows that p only if she does not think her belief that p is defeated*" (p. 87). This condition for knowledge has been called the no defeater condition or defeasibility. How might defeasibility relate to reliably produced clinical knowledge?

Research on clinical judgment suggests that clinicians often do not display greater skill in making accurate unaided clinical judgments than laypeople (Dawes, Faust, and Meehl, 1989; Garb, 1998). However, clinician judgment can be improved by relying on structured decision-making rules or other augmentative procedures that increase reliability and validity (Garb, 1998; Rogers, 2001). In practice, clinicians form beliefs about their clients from the first moment contact occurs. Since it is implausible that clinicians would approach the client without any preconception or bias, what would be required to increase clinician reliability? Clinicians would have to develop disciplined habits of inquiry that increase their sensitivity and exposure to defeaters capable of disabusing them of false beliefs.

Consider a hypothetical example of a client who presents clear clinical symptoms of a dissociative identity disorder (DID). Although the use of structured diagnostic criteria improves the reliability of clinical judgment, the clinician is also aware that alternative explanations for client report of DID symptoms is possible besides the presence of a true DID (Garb, 1998; Rogers, 1997). Having read Rogers (1997), the clinician believes that the initial appearance of DID symptoms in a forensic context provides presumptive evidence of malingering. Upon further investigation the clinician discovers that the first time the client's features manifested was in the context of a current court ordered appointment. Consequently, the clinician's belief that the client has DID waivers.

Concluding Comments

The clinical psychologist, properly trained, should function as a *clinical scientist*. This point finds support from a variety of perspectives. However, there is currently less consensus about the particular form such a clinical science should take. The contrasting views of some proponents of the Boulder (scientist-practitioner) and Vail (practitioner-scholar) models were chosen to illustrate these differences. What kind of a field science is clinical psychological sci-

ence? While McFall's (1991) approach suggests a strict empiricist view, alternative models exist that embrace a more pluralistic conception of science such as that exemplified by Trierweiler and Stricker (1998).

The current paper has suggested that the contemporary philosophical distinction between internalist and externalist epistemologies can productively expand the ongoing dialogue over clinical science. Externalism represents a radical shift in the epistemological landscape that has significant implications for the self-understanding of psychology as a science. Externalism helps illuminate how clinical judgment may be an appropriate, albeit incomplete and fallible, route to knowledge. Externalism also frees us up from the internalist hubris that is reflected in the attempt to rigidly define the contours of any science a priori. We are left with the less lofty but no less challenging task of teasing out from the ambiguity and uncertainty of the clinical context those aspects of our cognitive activities that produce knowledge in the local context of clinical practice.

The quantitative–empirical tradition has been one successful route to truth production in psychological science around which a variety of local standards have evolved (Bishop and Trout, 2004; Trout, 1998). Rather than serving as a static, rigid demarcation principle separating “scientific” from “unscientific” clinical psychology, it is likely that any such normative externalist account will continue to evolve and transform along with growth in the domain of clinical knowledge. While externalism does not exclude outright the possibility that other approaches to inquiry may be adduced which rival the quantitative–empirical tradition in the reliable production of clinical knowledge, the burden is upon advocates of novel scientific epistemologies to demonstrate successful instances of reliable knowledge production through their methods.

References

- Albee, G.W. (2000). The Boulder model's fatal flaw. *American Psychologist*, 55, 247–248.
- Alston, W. (1976). Two types of foundationalism. *Journal of Philosophy*, 82, 165–186.
- Alston, W. (1989). *Epistemic justification*. Ithaca: Cornell University Press.
- American Psychological Association Division of Clinical Psychology. (1995). Training in and dissemination of empirically validated psychological treatments: Report and recommendations. *Clinical Psychologist*, 48, 3–27.
- Armstrong, D.W. (1973). The thermometer-model of knowledge. In *Belief, truth, and knowledge* (pp. 162–175, 178–183). New York: Cambridge University Press.
- Ayer, A.J. (1952). *Language, truth and logic*. New York: Dover. (Originally published 1936).
- Barlow, D.H. (2000). Evidence-based practice: A world-view. *Clinical Psychology: Science and Practice*, 7, 241–242.
- Belar, C.D. (2000). Scientist–practitioner not = science + practice: Boulder is bolder. *American Psychologist*, 55, 248–250.
- Bergmann, M. (1997). Internalism, externalism and the no-defeater condition. *Synthese*, 110, 399–417.

- Bergmann, M. (2000). Deontology and defeat. *Philosophy and Phenomenological Research*, 60, 87–102.
- Bernecker, S., and Dretske, F. (2000). *Knowledge: Readings in contemporary epistemology*. New York: Oxford University Press.
- Beutler, L.E. (2004). The empirically supported treatments movement: A scientist–practitioner's response. *Clinical Psychology: Science and Practice*, 11, 225–229.
- Beutler, L.E., Williams, R.E., Wakefield, P.J., and Entwistle, S.R. (1995). Bridging scientist and practitioner perspectives in clinical psychology. *American Psychologist*, 50, 984–994.
- Bishop, M.A., and Trout, J.D. (2004). *Epistemology and the psychology of human judgment*. New York: Oxford University Press.
- Bonjour, L., and Sosa, E. (2003). *Epistemic justification: Internalism vs. externalism, foundationalism vs. virtue*. New York: Blackwell.
- Cartwright, N. (1983). *How the laws of physics lie*. New York: Oxford University Press.
- Creswell, J.W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, California: Sage.
- Dawes, R.M., Faust, D., and Meehl, P.E. (1989). Clinical versus actuarial judgment. *Science*, 243, 1668–1674.
- Garb, H. (1998). *Studying the clinician: Judgment research and psychological assessment*. Washington, D.C.: American Psychological Association.
- Gardner, M. (2001). A skeptical look at Karl Popper. *The Skeptical Inquirer*, 25, 13–14, 72.
- Goldman, A. (1967). A causal theory of knowing. *Journal of Philosophy*, 64, 355–372.
- Goldman, A. (1986). *Epistemology and cognition*. Cambridge, Massachusetts: Harvard University Press.
- Goldman, A.I. (2002). *Pathways to knowledge: Private and public*. New York: Oxford University Press.
- Greco, J. (2000). *Putting skeptics in their place: The nature of skeptical arguments and their role in philosophical inquiry*. New York: Cambridge University.
- Grove, W.M., and Meehl, P. (1996). Comparative efficiency of formal (mechanical, algorithmic) and informal (subjective, expressionistic) prediction procedures. *Psychology, Public Policy, and Law*, 2, 223–323.
- Hacking, I. (1983). *Representing and intervening*. Cambridge, England: Cambridge University Press.
- Hoch, E.L., Ross, A.O., and Winder, C.L. (Eds.). (1966). *Professional education of clinical psychologists*. Washington, D.C.: American Psychological Association.
- Johnson, J.L., and Hathaway, W.L. (2004). Training Christian practitioner–scholars: The Regent University example. *Journal of Psychology & Christianity*, 23, 331–337.
- Kaufman, D.A. (2002). Reality in common sense: Reflections on realism and anti-realism from a 'Common Sense Naturalist' perspective. *Philosophical Investigations*, 25, 331–361.
- Kim, K. (1993). Internalism and externalism in epistemology. *American Philosophical Quarterly*, 30, 303–316.
- Korman, M. (Ed.). (1976). *Levels and patterns of professional training in psychology*. Washington, D.C.: American Psychological Association.
- Kornblith, H. (Ed.). (2001). *Epistemology: Internalism and externalism*. Oxford: Blackwell.
- Kuklick, H., and Kohler, R.E. (1996). Introduction. *Osviris*, 2, 1–14.
- Kuenning, M. (1997). Gadamer's hermeneutic externalism. *The Southern Journal of Philosophy*, 35, 179–201.
- Kuhn, T. (1970). *The structure of scientific revolutions* (second edition). Chicago: University of Chicago Press.
- Leplin, J. (1997). *A novel defense of scientific realism*. New York: Oxford University Press.
- Levant, R.F. (2004). The empirically validated treatments movement: A practitioner/educator perspective. *Clinical Psychology: Science and Practice*, 11, 219–224.
- Loftus, E.F., and Polage, D.C. (1999). Repressed memories. When are they real? How are they false? *Psychiatric Clinics of North America*, 22, 61–70.
- McFall, R.M. (1991). Manifesto for a science of clinical psychology. *The Clinical Psychologist*, 44, 74–88.
- McFall, R.M. (2000). Elaborate reflections on a simple manifesto. *Applied and Preventive Psychology*, 9, 5–21.
- Meehl, P. (1986). Causes and effects of my disturbing little book. *Journal of Personality Assessment*, 50, 370–375.

- Miller, R.B. (2004). *Facing human suffering: Psychology and psychotherapy as moral engagement*. Washington, D.C.: American Psychological Association.
- Moser, P.K., Mulder, D.H., and Trout, J.D. (1998). *The theory of knowledge: A thematic introduction*. New York: Oxford University.
- Nathan, P.E. (2000). The Boulder model: A dream deferred — or lost? *American Psychologist*, 55, 250–252.
- Nathan, P.E., and Gorman, J.M. (Eds.). (2002). *A guide to treatments that work* (second edition). New York: Oxford University Press.
- Peterson, D.R. (Ed.). (1997). *Educating professional psychologists: History and guiding conception*. Washington, D.C.: American Psychological Association.
- Peterson, D.R. (2004). Science, scientism, and professional responsibility. *Clinical Psychology: Science and Practice*, 11, 197–210.
- Peterson, D.R., and Peterson, R.L. (1997). Ways of knowing in a profession: Toward an epistemology for the education of professional psychologists. In D.R. Peterson (Ed.), *Educating professional psychologists: History and guiding conception* (pp. 191–223). Washington, D.C.: American Psychological Association.
- Peterson, R., Peterson, D., Abrams, J., and Stricker, G. (1997). The National Council of Schools and Programs of Professional Psychology educational model. *Professional Psychology: Research and Practice*, 28, 373–386.
- Plantinga, A. (1992). *Warrant: The current debate*. New York: Oxford University Press.
- Plantinga, A. (1993). *Warrant and proper function*. New York: Oxford University Press.
- Polkinghorne, D.E. (1988). *Narrative knowing in the human sciences*. Albany, New York: State University of New York Press.
- Polkinghorne, D.E. (2004). *Practice and the human sciences: The case for a judgment-based practice of care*. Albany, New York: State University of New York Press.
- Popper, K.R. (1979). *Objective knowledge: An evolutionary approach* (revised edition). New York: Oxford University Press.
- Popper, K.R. (1983). *Realism and the aim of science*. Totowa, New Jersey: Rowman and Littlefield. (Originally published 1956)
- Quine, W.V. (1969). *Ontological relativity and other essays*. New York: Columbia University.
- Raimy, V.C. (Ed.). (1950). *Training in clinical psychology*. Englewood Cliffs, New Jersey: Prentice–Hall.
- Rogers, R. (1997). *Clinical assessment of malingering and deception* (second edition). New York: Guilford Press.
- Rogers, R. (2001). *Diagnostic and structured interviewing: A handbook for psychologists*. New York: Guilford Press.
- Shakow, D. (1978). Clinical psychology seen some 50 years later. *American Psychologist*, 33, 148–158.
- Soldz, S., and McCullough, L. (Eds.). (2000). *Reconciling empirical knowledge and clinical experience: The art and science of psychotherapy*. Washington, D.C.: American Psychological Association.
- Stanovich, K.E. (2004). *How to think straight about psychology* (seventh edition). Boston: Allyn and Bacon.
- Stricker, G., and Trierweiler, S.J. (1995). The local clinical scientist: A bridge between science and practice. *American Psychologist*, 50, 995–1002.
- Swets, J., Dawes, R., and Monohan, J. (2000). Psychological science can improve diagnostic decisions. *Psychological Science in the Public Interest*, 1, 1–26.
- Trierweiler, S.J., and Stricker, G. (1998). *The scientific practice of professional psychology*. New York: Plenum.
- Trout, J.D. (1998). *Measuring the intentional world: Realism, naturalism, and quantitative methods in the behavioral sciences*. New York: Oxford University Press.
- Urbach, P. (1987). *Francis Bacon's philosophy of science: An account and reappraisal*. LaSalle, Illinois: Open Court.
- Witmer, L. (1996). Clinical psychology. *American Psychologist*, 51, 248–251. (Originally published 1907)
- Wolcott, H.F. (1995). *The art of fieldwork*. Walnut Creek, California: AltaMira Press.