

Unified Psychology

Robert J. Sternberg
Elena L. Grigorenko

Yale University
Yale University and Moscow State University

The authors describe an approach to psychology they refer to as unified psychology, which is the multiparadigmatic, multidisciplinary, and integrated study of psychological phenomena through converging operations. In this article, they unpack this definition and explore some of its implications. First, they review some previous efforts to conceive of a unified psychology and consider objections to such an undertaking. Second, they discuss the importance of converging operations for psychology. Third, they consider the need for multidisciplinary and integrated study of psychological phenomena that focuses on the phenomena rather than on particular lines of disciplinary inquiry. Fourth, they ponder the problem of investigators' becoming locked into a single paradigm with its attendant set of presuppositions about psychological theory and research. Fifth, they outline some possible objections to their proposal and respond to them. Finally, they discuss some implications of their views.

Unified psychology is the multiparadigmatic, multidisciplinary, and integrated study of psychological phenomena through converging operations. In this article, we propose that unified psychology can and should supplement traditional approaches to psychology. Some readers might even find it a suitable replacement for several traditional approaches. To unpack our definition, we need to look at each of its aspects. But before we do, we must summarize a major contention of our article.

Unified psychology, as we conceive of it, involves giving up or, at least, putting aside what we believe to be three bad habits that are commonplace among some psychologists. The bad habits are (a) exclusive or almost exclusive reliance on a single methodology (e.g., response-time measurements or fMRI measurements) rather than multiple converging methodologies for studying psychological phenomena; (b) identification of scholars in psychology in terms of psychological subdisciplines (e.g., social psychology or clinical psychology) rather than in terms of the psychological phenomena they study; and (c) adherence to single underlying paradigms for the investigation of psychological phenomena (e.g., behaviorism, cognitivism, psychoanalysis).

Before we elaborate on our view of the good habits that can replace these bad ones, we discuss some previous proposals regarding the notion of a unified psychology. We also consider objections that have been raised to such proposals.

Previous Proposals Regarding the Unification of Psychology

Perhaps the whole issue of unity versus disunity—in psychology or any other science—was best framed by Berlin (1953), who argued that there are different sorts of people: *hedgehogs*, who try to relate everything to a single system or vision, and *foxes*, who pursue many different paths without trying to fit them together. (A third class of person is a fox who sees him- or herself as a hedgehog.) The distinction is based on the words of the Greek poet Archilochus, who said, “The fox knows many things, but the hedgehog knows one big thing.” Therefore, those who seek unification are the hedgehogs.

Although the distinction may be too sharp, it seems roughly to apply to the literature that has grown up around the issue of unification in psychology. Consider the views of both hedgehogs and foxes.

Attempts by hedgehogs to unify psychology go back a long way, in part because psychology has a long history as a “house divided” (Kimble, 1989, p. 491). For example, Baldwin (1902) went about integrating the study of development with that of evolution; Baldwin (1897/1906) also combined social-psychological and developmental techniques in studying mental development. But many attempts at unification are much more recent.

One of the most ambitious and more recent efforts at unifying psychology was undertaken by Staats (1991), who proposed what he referred to as a “unified positivism and unification psychology” (p. 899; see also Staats, 1983, 1993). Staats suggested that psychology has suffered from a crisis of disunity and that the crisis has needed, for some time, to be resolved. He further suggested that unification

Robert J. Sternberg, Yale Center for the Psychology of Abilities, Competencies, and Expertise (PACE Center), Yale University; Elena L. Grigorenko, PACE Center, Yale University, and Department of Psychology, Moscow State University.

Preparation of this article was supported by Grant REC-9979843 from the National Science Foundation and by Grant R206R000001 awarded under the Javits Act Program, as administered by the Office of Educational Research and Improvement, U.S. Department of Education. Grantees undertaking such projects are encouraged to freely express their professional judgment. Therefore, this article does not necessarily represent the positions or the policies of the U.S. government, and no official endorsement should be inferred.

This article represents a substantial expansion of ideas first presented in Sternberg and Grigorenko (2001), on which the third major section of the article is based.

Correspondence concerning this article should be addressed to Robert J. Sternberg, PACE Center, Yale University, Box 208358, New Haven, CT 06520-8358.



Robert J. Sternberg

Photo by Michael Marsland, Yale University Office of Public Affairs

could be achieved not by the old “grand theories” of psychology but through interlevel and interfield theories. An interlevel theory would seek to bridge different levels of analysis of a phenomenon, such as the application of basic learning principles to language learning. The idea here is to form connections between one level of analysis that calls on more elementary principles—in this case, presumably, learning theory—and a second level of analysis that presumably is more molar—in this case, presumably, language learning. An interfield theory would seek to bridge different fields of analysis of the same phenomenon, such as biological and psychological approaches to a problem. The idea here is to form connections between fields that may have members studying the same problem with different methods and different perspectives.

Staats (1999) further suggested that part of the reason that psychology may have failed to become unified is because it lacks an infrastructure for unification. For example, in unified sciences, there are single terms corresponding to particular theoretical constructs, such as the quark in physics. In psychology, particular theoretical constructs are often associated with multiple terms, with the distinctions among them unclear. Staats gave “self-concept,” “self-image,” “self-perception,” “self-esteem,” “self-confidence,” “self,” and “self-efficacy” as examples of concepts whose differences are, in his opinion, at best, ill-defined. Further problems discouraging unification are that (a) there are many theories in psychology but few attempts to interrelate them and (b) each theory must be discussed using a different language, so conversations in which theories are being compared or contrasted sometimes are virtually unintelligible.

A somewhat different approach has been taken by systems theorists (e.g., Kuo, 1967, 1976; Magnusson, 2000; Sameroff, 1983; Schneirla, 1957; Thelen, 1992;

Thelen & Smith, 1994, 1998). For example, Magnusson (2000) has proposed that a holistic approach to psychological inquiry and to the individual can provide a basis for integrating and unifying many diverse outlooks on human development. Sameroff and Bartko (1998) have applied a political-systems metaphor to child development. Lerner (1998) has also taken a systems approach, arguing that the multiple levels of organization that constitute human life—from the biological to the individual to the social and beyond—all need to be understood within a common framework. Cairns (1998) has made a similar suggestion. Bronfenbrenner (1979; Bronfenbrenner & Morris, 1998) has actually proposed such a framework, with interlocking systems of development, such as the microsystem, which encompasses the individual; the mesosystem, which encompasses the family, school, peers, religious institutions, and so forth; the exosystem, which includes the extended family, neighbors, mass media, social welfare and legal services, and so forth; and the macrosystem, which includes the attitudes and ideologies of the culture.

Other investigators, although not necessarily proposing such comprehensive frameworks, have also argued in favor of the unification of psychology and have made related suggestions regarding the need for some kind of effort at unification. For example, Royce (1970) suggested that psychology was fragmenting and needed more organization and more unity. Bevan (1991, 1994) argued that specialization can give rise to “regressive fragmentation” (Bevan, 1994, p. 505) and “self-limiting specialization” (Bevan, 1982, p. 1311), which alienate psychology from larger human concerns. Maher (1985) also spoke of the fragmentation and chaotic diversity in psychology. MacIntyre (1985) suggested that such chaos gives rise to the view that psychology is prescientific rather than scientific. Rychlak (1988) saw the problem of fragmentation as having three aspects: theoretical, methodological, and scholarly. He believed that a first step toward unification would be the development of a greater tolerance by psychologists of differences among psychologists. DeGroot (1989) suggested that for psychologists to achieve unification, they would need to reach some kind of greater consensus both as to the mission of psychology and as to what constituted its methods. Kimble (1994) suggested that unification was desirable and could be achieved by a set of principles, which he proposed in his article. Fowler (1990) also called for unification, in his case, of science and practice. Wapner and Demick (1989) argued that the unification of psychology was overdue, whereas Anastasi (1990) suggested that psychology already was making large steps toward unification.

Not everyone has believed the unification of psychology to be a good idea. Some of the foxes’ critiques of unification have been in direct response to Staats’s (1991) call for unification. McNally (1992) suggested, on the basis of his analysis of Kuhn (1991), that the diversity and disunity present in psychology might be a sign of health rather than of illness. Kukla (1992) proposed that the whole goal of unification is questionable: Psychologists should concentrate on producing the best theories possible and



Elena L. Grigorenko

then let the chips fall where they may. And Green (1992), although not taking issue with the notion of unity, suggested that Staats's positivistic program is not the optimal way to achieve unity.

Other researchers also have questioned the prospects for unification. For example, Koch (1981) suggested that psychology, by its nature, may not be unifiable. (See Leary, 2001, for a detailed analysis of Koch's point of view.) Krech (1970) also believed that psychology, by its nature, could not be unified. Wertheimer (1988) suggested that, at best, unification would face many obstacles. Kendler (1987) suggested that a natural division exists between psychology as a natural science and as a social science and that this division would continue to express itself in psychological theory and research. In a separate article, Kendler (1970) suggested that unifying psychology requires reducing any two of the three subject matters of behavior, neurophysiological events, and phenomenal experience to the third. Messer (1988) argued that even clinical psychology, a part of the social science side of psychology, would be difficult to unify. Viney (1989) noted that unity has both pros and cons and that both must be considered before psychology moves toward unification. And Scott (1991) observed that as psychology branches out and becomes more specialized, divisions are to be expected as a natural outcome.

Clearly, then, there have been diverse points of view regarding whether unification is possible and, if so, what form it should take. In this article, we propose one such form that the unification of psychology might take, which we refer to here as *unified psychology*.

Converging Operations

Converging operations refers to the use of multiple methodologies for studying a single psychological phenomenon

or problem. The term was first introduced by Garner, Hake, and Erikson (1956) in a groundbreaking article on psychological methodology. The basic idea is that any one operation is, in all likelihood, inadequate for the comprehensive study of any psychological phenomenon. The reason is that any methodology introduces biases of one kind or another, often of multiple kinds. By using multiple converging methodologies (i.e., converging operations) for the study of a single psychological phenomenon or problem, one averages over sources of bias.

There are many examples of how converging operations can illuminate phenomena in a way that no one operation can. (See the original Garner et al., 1956, article for examples.) Often new constructs are especially well served by such operations.

Consider, for a first example, the construct of prejudice. Prejudice traditionally has been measured in one of two ways: either by a questionnaire asking participants to characterize their feelings toward groups of people (Allport, 1929; Dovidio & Gaertner, 2000) or by observations of behavior (Sherif, Harvey, White, Hood, & Sherif, 1961/1988). Many studies have shown that attitudes are often not particularly good predictors of behavior (e.g., Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997). If one wished to understand prejudices, one would have to study both participants' verbally expressed attitudes and participants' actual behavior.

Of course, one could say that the crucial measure is behavior and that the attitudes are only interesting to the extent that they predict behavior. We disagree. Behavior is as interesting a predictor of attitudes, as are attitudes of behavior. There is no ultimate dependent variable. Consider an example of this notion as it applies to attitudes and prejudices.

Recently, Greenwald, Banaji, and their colleagues (Greenwald & Banaji, 1995; Greenwald et al., 2000) have developed measures of implicit attitudes that examine a wholly different aspect of how people feel about certain groups of individuals. These measures each are referred to as an Implicit Association Test or IAT (Greenwald, McGhee, & Schwartz, 1998). The IAT is a computer-based reaction-time measure that estimates the degree of association between target concepts, such as attitudes toward African Americans and attitudes toward White Americans, and an evaluative dimension, such as pleasant-unpleasant. For example, African American faces are paired with the words *good* or *bad*, as are White American faces. On half the trials, one pushes the same response key for White and *good*, and on the other half, one presses the same key for White and *bad*. The same holds for Black and *good* and Black and *bad*. One can then compare the time it takes to associate *good* or *bad* with White or Black. The test provides a relative measure. In other words, a target concept (attitudes toward African Americans) must have a contrasting domain (attitudes toward White Americans). A participant's responses will indicate an implicit attitude toward African Americans relative to his or her implicit attitude toward White Americans.

Using such measures, these investigators have found consistently prejudiced implicit attitudes of White Americans toward African Americans and even often of African Americans toward African Americans. They have uncovered other negative implicit attitudes as well. Their measures of implicit attitudes correlate only poorly with the traditional measures of explicit attitudes, in which one simply asks individuals to state or rate their attitudes toward members of various groups. Thus, what result one gets depends on the dependent variable one uses.

The data suggest converging operations are needed if one wishes to fully understand people's attitudes toward various groups. One may wish to look at, for example, indicators of implicit attitudes, which usually involve timed decision tasks; measures of explicit attitudes, which typically take the form of questionnaires; or assessments of behavior. Ideally, one looks at all three.

Of course, there are many other examples of attitudes failing to predict behavior. Most people would agree that drunken driving is irresponsible, but a number of these people do it anyway. Many people who know that condom use may literally save their lives by preventing transmission of the HIV virus nevertheless fail to use condoms when they know they should. People who know that smoking is killing them continue to smoke. The examples are endless.

Another example of the need for converging operations can be seen in the study and measurement of intelligence and related intellectual abilities. Sternberg, Grigorenko, Ferrari, and Clinkenbeard (1999) used both multiple-choice and essay items to assess analytical, creative, and practical intellectual abilities. One of their analyses involved the use of confirmatory factor analysis by which they investigated, among other things, how effective the two item types (multiple choice and essay) were in assessing the three different kinds of abilities. They found that the multiple-choice items were the more effective in assessing analytical abilities—the types of abilities assessed by traditional tests of intellectual skills—whereas the essay items were more effective in assessing creative and practical abilities. Using just one type of item (e.g., all multiple choice or all essay) would have resulted in inferior measurements.

The principle of converging operations applies beyond the particular kinds of test items to the kinds of investigative operations used as well. The study of intelligence traditionally has drawn heavily on factor analysis. For example, Carroll (1993) followed in a long line of investigators who have developed and tested theories of intelligence largely or exclusively on the basis of factor analysis (e.g., Guilford, 1967; Spearman, 1927; Thurstone, 1938; see reviews in Brody, 2000; Carroll, 1982; Mackintosh, 1998; Sternberg, 1990). Nothing is wrong with factor analysis per se, but any single method has advantages and drawbacks. For example, factor analysis as typically used in the study of intelligence relies solely on the use of individual differences as sources of data. But many other useful sources of information can be drawn on to study intelligence, such as cultural analysis (Laboratory of Com-

parative Human Cognition, 1983; Serpell, 2000), cognitive analysis (Cooper & Regan, 1982; Deary, 2000; Estes, 1982; Lohman, 2000; Sternberg, 1982), and biological analysis (e.g., Larson, Haier, LaCasse, & Hazen, 1995; MacLulich, Seckl, Starr, & Deary, 1998; Vernon, 1997; Vernon, Wickett, Bazana, & Stelmack, 2000). These other methods of investigation can yield findings simply not susceptible to discovery by factor analysis and, in some cases, may call into question some of the results of factor analysis (e.g., Gardner, 1983, 1999; Sternberg, 1985, 1997). Our goal here is not to take a position on whether the results of factor analysis or any other single method in particular are right or wrong. It is simply to point out that converging operations can yield insights about psychological phenomena that are opaque to any single methodology.

If, as Garner, Hake, and Erikson (1956) claimed, converging operations are so superior to single operations, why do some and perhaps many psychologists rely largely or even exclusively on a single method of analysis (or, for that matter, only two methods of analysis)? We believe there are three main reasons, none of them really acceptable from a research standpoint.

Training

Psychologists may have been trained largely in the use of a single methodology. They may have subsequently invested heavily in that methodology in their work. Learning how to do structural equation modeling, neural imaging, or qualitative analysis, for example, can require a large amount of work, especially if one wishes to perfect each of the set of techniques. Researchers may seek to maximize the return on their time investment and to use what they have learned as much as possible. Even if they come to see the flaws of their preferred methodology, they may come to view the time invested as a sunken cost and seek to justify or even redeem the investment anyway. They thereby can become fixed in their use of a single method of analysis.

Panaceas

Researchers can come to view a single methodology as representing a kind of panacea for the study of a certain problem or set of problems. At one time, exploratory factor analysis was seen in this way by some psychometric investigators, until its limitations became increasingly apparent (e.g., the existence of an infinite number of rotations of axes, all representing equally legitimate solutions statistically). To some of the same investigators, as well as to other investigators, confirmatory factor analysis or structural equation modeling may have come to seem to be a panacea, although these methods, too, have their limitations, such as reliance on individual differences. Today, some scientists view neural imaging methods as a panacea. Some psychologists are busy compiling mental atlases that link certain areas of the brain to certain aspects of cognitive processing, although they are often oblivious to the functional relations between the two and are sometimes making these links in the absence of an adequate theoretical foundation (see Sternberg, 2000). The truth is that no method will provide a panacea: Different methods have different

advantages and disadvantages, and, by using multiple methods, one capitalizes on the strengths of the methods while helping to minimize the effects of their weaknesses.

Norms

Norms of a field may also lead to methodological fixation. Some years ago, Robert J. Sternberg submitted an article to one of the most prestigious psychological journals available. He was asked to revise the article, replacing regression analyses of the phenomenon under investigation with analyses of variance. The request was odd because the two methods of analysis gave equivalent information (see Cohen & Cohen, 1983). But the norm of the journal was use of analysis of variance reporting. Fields, journals, and other collectivities develop norms that to the members of those collectivities may seem perfectly reasonable and even beyond question. These norms may become presuppositions of behavior that are accepted in a rather mindless way (Langer, 1997). The norms may lead investigators to do things in a certain way, not because it is the best way, but, rather, because it comes to be perceived as the only way or the only way worth pursuing.

In Sum

Unified psychology, then, means giving up on single operations in favor of multiple converging operations. Such work requires either that individuals be trained in a wider variety of methodologies than they currently are trained in or else that they work in teams having members with various kinds of expertise (see Sternberg & Grigorenko, 1999).

Ultimately, the converging operations and perspectives that are brought to bear on a problem can and generally should go even beyond those of psychology. Investigations of many psychological phenomena can be enriched by the ideas of other disciplines, such as biology, anthropology, neuroscience, and so forth (Woodward & Devonis, 1993). For example, psychologists can enrich their perspectives of child rearing by understanding how people in other cultures rear children, or they can broaden their perspectives on aggressive behavior by taking into account what is considered to be aggressive in the first place in one culture versus another.

Multidisciplinary, Integrated Study of Psychological Phenomena

Field fixation can be as damaging to the understanding of psychological phenomena as is methodological fixation. Psychology is divided into areas such as biological psychology, clinical psychology, cognitive psychology, developmental psychology, industrial and organizational psychology, social psychology, personality psychology, and so forth. Departments often organize the specializations of their professors in this way; graduate programs are usually structured in this way; jobs are typically advertised in this way. This organization of the field, departments, graduate programs, and jobs represents a suboptimal organization of the field. It encourages division rather than unification.

Preserving the Status Quo

Several factors play a role in maintaining the current suboptimal organization of psychology.

Tradition. First and foremost, this method of organization is the way things have been done for a long time. When a system of organization is entrenched, people tend to accept it as a given. For example, most psychology departments have chairpersons, but members of those departments probably do not spend a lot of time questioning whether they should have chairpersons—they just accept this system of organization. Of course, new fields within psychology come and go. For example, the fields of evolutionary psychology and health psychology are relative newcomers to the roster of fields of psychology. They will either become part of the standard organization of the field or slowly disappear.

Vested interest. Second, once a discipline such as psychology has been organized in a certain way, people in the discipline acquire a vested interest in maintaining that organization, much as people gain a vested interest in maintaining any system that seemingly has worked for them in the past. For example, most cognitive psychologists were trained as cognitive psychologists, and personality psychologists as personality psychologists. Were the field suddenly to reorganize, current scholars and practitioners might find themselves without the kind of knowledge base and even the socially organized field of inquiry that would allow them to continue to function successfully.

The need to specialize. Third, no one can specialize in everything. Students of psychology need to specialize in some way, and structuring psychology in terms of fields has been viewed as a sensible way to define specializations. Thus, someone who specializes in social psychology will be expected to know about a series of related phenomena such as impression formation, attribution, and stereotyping. Someone who specializes in cognitive psychology will be expected to know about a set of related phenomena such as perception, memory, and thinking. Successively greater levels of specialization ultimately may be encouraged; for example, a cognitive psychologist may pursue a very specific line of inquiry, such as cognitive approaches to memory, to implicit memory, or to the use of priming methodology in studying implicit memory.

Reasons to Change

We believe that the current organization of the field is distinctly suboptimal and even maladaptive. We have several reasons for this belief.

The field could be organized better to understand psychological phenomena. Examples of psychological phenomena include memory, intelligence, dyslexia, attachment, creativity, prejudice, and amnesia, among others. None of these phenomena are best studied within a specialized field of psychology.

For example, although memory can be investigated as a cognitive phenomenon, it can and should be studied through the techniques of a number of other fields. These fields include biological psychology and cognitive neuro-

science (e.g., in attempts to find out where in the brain memories are stored), clinical psychology (e.g., in the conflict over repressed memories), social psychology (e.g., in preferential memory for self-referential memories), and behavioral genetics (e.g., in the heritability of memory characteristics), to name just some of the relevant fields. Someone studying memory through only one approach or set of techniques will understand only part of the phenomenon.

Similarly, extraversion can be and has been studied from personality, differential, biological, cognitive, social, cultural, and other points of view. Someone studying extraversion from only one of these points of view—for example, personality—almost certainly will understand the phenomenon only in a narrow way, in terms of, say, extraversion as a trait, without fully appreciating the role of biological or cognitive processes or of culture, for that matter.

The same argument can be applied to virtually any psychological phenomenon. By subsuming psychological phenomena under fields of psychology, the discipline encourages a narrow view rather than a broad approach to understanding psychological phenomena.

Organizing by fields can isolate individuals who study the same phenomena. For example, two individuals within a psychology department may both study attachment, but if one is in personality psychology and another in developmental psychology, they may have little interaction. This is because in a typical department, students and professors are located next to—and attend the same meetings and read the same journals as—others in their field regardless of the phenomena being studied.

The current organization may create false oppositions between individuals or groups studying phenomena from different vantage points. Here is an example: Individuals studying memory from a cognitive perspective may never quite understand the work of those studying memory from a clinical standpoint. This can lead to a sense of hostility toward the viewpoints of those who do not understand their (preferred) way of studying memory. Or individuals studying love from social psychological versus clinical points of view may (and sometimes do) see themselves in opposition, as though there were a uniquely correct approach to studying a psychological phenomenon.

The current system tends to marginalize psychological phenomena that fall outside the boundaries of a specific field. For example, psychological phenomena such as imagination, motivation, or emotion may tend to be ignored in a department if they are not seen as part of the core of a field. This also extends to the people studying such phenomena, who may have difficulty getting hired because hiring is often done by area, and the people studying phenomena at the interface of fields of psychology may be perceived as not fitting neatly into any one area. In turn, faculty in a given area may not want to hire such people if they feel that their area will not get the full benefit of a slot or that such individuals will not

contribute adequately to graduate (or even undergraduate) training in that so-called core field.

Research may tilt toward issues to which a limited set of tools may be applied. The current system essentially equips students with a set of tools (e.g., the methods of developmental psychology, or cognitive neuroscience, or social psychology, or mathematical psychology). Instead of allowing students to be driven by substantive issues, the system encourages students to search for a phenomenon for which they can use their tools, much in the way a carpenter might seek objects for which he or she can use a hammer.

The current system can discourage new ways of studying problems. If someone wishes to educate students in terms of the existing boundaries of fields, he or she will encounter few problems. But if he or she wants to cross those boundaries, other faculty may worry that the individual students will not be properly trained in a field, may have trouble getting a job, or may not fit into the departmental structure. In truth, they may be justified in all these concerns.

The traditional disciplinary approach of largely subsuming psychological phenomena under fields of study rather than the other way around leads psychologists to confuse aspects of phenomena with the phenomena as a whole. This confusion is analogous to the use of synecdoche in speech, where one substitutes a part for a whole (e.g., *crown* for *kingdom*). However, unlike poets or other writers, psychologists are unaware of their use of this device. The psychologists believe they are studying the whole phenomenon when, in fact, they are studying only a small part of it.

Consider the well-worn parable of the blind men each touching a different part of the elephant and each being convinced that he is touching a different animal. In psychology, the situation is like always studying the same part of a phenomenon and thinking that this part tells you all you need to know to understand the whole phenomenon. Consider two examples.

In the study of human intelligence, psychometricians may keep discovering a “general factor” and thus become convinced that the general factor largely explains intelligence. Biological psychologists may find a spot or two in the brain that light up during the fMRI or PET-scan analysis of the commission of cognitive tasks and become convinced that these parts of the brain fully explain intelligence. Cultural psychologists may find wide cultural differences in notions of the nature of intelligence and become convinced that intelligence is best explained simply as a cultural invention. Each psychologist touches a different part of the metaphorical elephant and becomes convinced that part represents the whole (and fairly simple) animal.

As a second example, attention deficit hyperactivity disorder (ADHD) has genetic, neuropsychological, cognitive, educational, social, and cultural aspects. Some of the debate in the field of ADHD has come to be over whether the origins of ADHD are genetic, neuropsychological, cognitive, educational, social, or cultural. This ongoing, fruit-

less debate is unlikely to end until scientists are trained in each other's fields and paradigms so that they will understand that learning disabilities, like other psychological phenomena, need to be understood from all of these perspectives, not just one. Of course, the same argument applies to many other psychological phenomena, such as emotions, consciousness, motivation, mental disorders, perception, memory, creativity, and so forth.

A Phenomenon-Based Proposal

In general, scientists who are not well trained in one another's techniques are likely to be suspicious of others' techniques and of the conclusions drawn from them. These scientists probably will continue to do research within their own paradigm, which keeps supporting their views and thereby reinforces their confidence that they are right and that those who adhere to a paradigm from some other field are misguided.

We believe that a more sensible and psychologically justifiable way of organizing psychology as a discipline and in departments and graduate study is in terms of psychological phenomena—which are not arbitrary—rather than so-called fields of psychology—which largely are arbitrary. Under this approach, an individual might choose to specialize in a set of related phenomena, such as learning and memory, stereotyping and prejudice, or motivation and emotion, and then study the phenomena of interest from multiple points of view. The individual thus would reach a fuller understanding of the phenomena being studied because he or she would not be limited by a set of assumptions or methods drawn from only one field of psychology.

Our proposal carries with it a number of advantages that are largely complementary to the disadvantages of the field-based approach that currently dominates the discipline. People might very well end up specializing in several related psychological phenomena, but they would understand these phenomena broadly rather than narrowly, which is certainly an advantage if their goal is comprehensive psychological understanding. Psychology would be less susceptible to tendencies that field-based organization encourages: narrowness, isolation, false oppositions, marginalization, largely method-driven rather than phenomenon-driven approaches to research, discouragement of new ways of approaching psychological phenomena, and confusion of the part with the whole.

In Sum

Unified psychology, then, means giving up a single disciplinary approach in favor of an integrated multidisciplinary approach in which problems rather than subdisciplines become the key basis for the study of psychology. One chooses a particular disciplinary approach because it is useful in studying a psychological phenomenon rather than choosing a particular psychological problem because it happens to fall within the subdiscipline in terms of which one defines oneself.

The Approach of Unified Psychology

The history of psychology may be viewed as the history of a sequence of failed paradigms. The paradigms failed not because they were wrong—paradigms are not right or wrong (Kuhn, 1970)—but rather because they provided only incomplete perspectives on the problems to which they were applied. Almost every introductory-psychology student learns how structuralism gained in popularity, only eventually to fall when its weaknesses were appreciated. The student learns as well how functionalism, associationism, and a host of other “-isms” have come and go, with each generation of researchers hoping that their -ism will somehow be the last. At best, the sequence of paradigms has represented a dialectical progression (Hegel, 1807/1931; see discussion in Sternberg, 1999), with new paradigms synthesizing the best aspects of older ones. At worst, one failed -ism has simply replaced another without any signs of learning on the part of its adherents that this paradigm, too, shall pass. Of course, in each of these generations, many scholars have believed that they have at last found the answer, oblivious to the fact that they have merely repeated a pattern of the past.

When Robert J. Sternberg was in graduate school, he asked his graduate advisor about work the advisor had done previously on mathematical models of learning theory. The advisor, Gordon Bower, remarked that he had trouble remembering why he thought earlier that the questions the models addressed were so important. Such is how paradigms come and go. They go not when they are proven wrong but when they run out of steam, fail to account for new empirical results, or fail to provide the means to answer the questions that investigators in a given period of time most want to answer (see Kuhn, 1970, for a detailed discussion of the evolution of paradigms).

If one considers a basic psychological phenomenon, such as learning, one realizes that it can be studied in terms of an evolutionary paradigm, a brain-based biological paradigm, a cognitive paradigm, a behaviorist paradigm, a psychoanalytic paradigm, a genetic-epistemological paradigm, and so forth. There is no one correct perspective. Each perspective presents a different way of understanding the problem of learning.

Some Potential Objections to the Endeavor of Unified Psychology

Of course, there are potential objections to the concept of unified psychology. Consider some of them as well as possible responses.

The Discipline of Psychology Already Is Unified; the Call for a Unified Psychology Attacks a Straw Person

We see relatively little unification in the field at the present. The large majority of journals are specialized. Some that are not in theory are in practice accepting only articles in which the authors use certain accepted paradigms or methodologies. Granting panels often accept grant proposals in much the same way, although, of course, there are excep-

tions. Conventions or sections of conventions often are specialized. Courses often are taught in a disunified way, with topics presented in isolation from each other. For the most part, jobs are advertised in terms of fields of specialization, and promotions may depend on convincing referees within a narrow field of specialization that one is truly a member of the in-group of that field and that one is an important contributor to it. Even within broad-based organizations, such as the American Psychological Association, it has proven difficult to unify special interests, and many groups have split off precisely because of the difficulty of keeping the field unified and the view of some that such unification is not important.

The Discipline Already Has a Field of General Psychology, Which Is the Same as Unified Psychology

In today's world, general psychology is not the same as unified psychology. General psychology encompasses various fields of psychology but does not necessarily unify them. General psychology texts often cover a variety of topics in psychology without unifying them at all. For example, learning and memory typically are covered in separate chapters, despite their obvious relationship. General psychology is embracing but not necessarily unifying. But to the extent one wishes to redefine general psychology as unifying and not just embracing the many aspects that constitute psychology, we would be happy to view this form of general psychology as being the same as our proposed unified psychology.

Even if Unified Psychology Is Not the Same as General Psychology, There Is Nothing New in the Concept

At some level, we agree. Unified psychology represents a goal toward which many people have strived ever since psychology's earliest days. But not so many people have achieved it, and we suspect that as the field becomes more specialized, fewer and fewer people will. The term *unified psychology*, at worst, may help provide a rubric for a pretheoretical stance that many scientists and practitioners will find fits them better than rubrics that force adherence to paradigms or methodologies that are in themselves incomplete. To the extent that psychologists use a term to motivate what they do, we believe the term serves a valuable purpose. Thinking of oneself as, say, a social psychologist or a personality psychologist may guide what one studies and how one studies it. Thinking of oneself as a unified psychologist may do the same.

The Term Unified Psychology Is a Misnomer, Because One Has Substituted Divisions by Phenomena for Divisions by Fields

One perhaps could argue that the term *unified* never would apply unless one looked at something solely as a gestalt—as a single, indivisible entity. We disagree with this point of view, because even that indivisible entity would be a part of some greater whole, which in turn would be a part of some greater whole, and soon one would lapse into

infinite regress. Unification is always with respect to something. When we use the term *unified*, we use it with respect to what currently constitutes the subdisciplines of psychology. We make no claim that our proposal is unified with respect to everything, a claim we believe, in any case, would be meaningless.

The Direction of the Discipline Is Toward Specialization, Not Integration: Needed in Training Are Specialists Who Can Do Precise Scientific Work, Not Generalists or Even Dilettantes Who, However Useful They Might Have Been in Psychology's Prescientific Days, No Longer Advance the Discipline

We have argued elsewhere (Sternberg & Grigorenko, 1999) that dilettantism is and always has been useful to the discipline of psychology. But unified psychology goes beyond dilettantism and is not contrary to specialization. Today, people of course need some kind of specialization. However, there is a narrow form of specialization and a broad form. Narrow specialization is where one looks at a problem with tunnel vision and knows only a narrow range of techniques to apply in solving that problem. In broad specialization, one may look at a fairly specific problem but do so with open eyes and with the benefit of the many problem-solving techniques a multidisciplinary approach leaves at one's disposal. Any phenomenon, no matter how specialized, can be studied in such a way. The value of such study is the message that unified psychology conveys.

The Proposal Is Inconvenient and Even Impractical

In the near term, our proposal would be inconvenient because it is inconsistent with an entrenched system that extends to departmental organization, graduate and even undergraduate education, job offerings, and the like. It also is inconvenient simply because this is not the way people currently in the field have been trained, and people tend to value systems that have worked for them in the past and that are likely to work for them in the future without disturbing their world. We believe or, at least, hope that the inconvenience of a new system would be outweighed by the ultimate benefit to the field that the proposed system would offer.

Training Under the New System Would Take Too Long

Some might view the kind of training we propose as taking longer than traditional training, but we see no reason to believe this is so. What would change is not so much how long one spends in training but how one spends the time one is in training. Truly, training in psychology is lifelong, and no matter what kind of graduate training one receives, one always needs to be learning in order to stay on top of a field, however that field is defined. Good training does not end with a diploma but, in some respects, merely changes in form with the diploma.

In Solving One Kind of Problem of Suboptimal Divisions, the New System Introduces Others

One could argue that the new system introduces new problems that are not so different from the ones it is supposed to solve. For example, psychological phenomena are mutually interdependent. Thus, studying such phenomena in depth still would give one only a limited picture of them. For example, interpersonal attraction may depend on personality, attitudes, early experience, and so forth. We believe this objection is mistaken, however. The comprehensive study of any phenomenon, such as interpersonal attraction, always has brought and always will bring to bear multiple perspectives on the multiple factors that contribute to the phenomenon. We view such interdependence not as a problem for but as an advantage of our approach.

In Sum

Unified psychology, then, means giving up a single paradigm in favor of the use of whatever paradigm may help shed light on a problem. Multiple paradigms can contribute to the understanding of a single psychological phenomenon, whereas locking oneself into any single paradigm reduces one's ability to fully grasp the phenomenon of interest.

Some Implications of the Unified-Psychology View

The unified-psychology perspective has several implications for modern-day work in psychology. Here are a few of them.

Psychology Will Only Fragment if Psychologists Wish It To

Gardner (1992) argued that psychology is undergoing a process of fragmentation and that eventually it may become a much smaller field, with much of what is currently classified as psychology being subsumed by disciplines such as cognitive science or cognitive neuroscience. Not everyone agrees with this assessment. However, psychology is more likely to fragment if people accept new fields as somehow providing the final questions or answers that old ones lacked. For example, researchers in the field of cognitive science have much to gain from studying the contexts of behavior, the social psychology of cognitive processes, links between cognition and emotion (or personality), and so forth. The new panaceas are no better than the old ones. Psychology needs all its parts—integrated in a unified way.

Students of psychology need to be trained in general psychology as well as in specializations and other fields of inquiry (e.g., biology, philosophy, anthropology, sociology, and statistics). However, general psychology is not tantamount to unified psychology. It is not enough to have all the disciplines of psychology under one big roof. The disciplines need to be synthesized with respect to paradigms, theories, and methods (see also Kalmar & Sternberg, 1988).

New Movements Will Soon Fail if They Are Not Unified

In our view, current thinking often inadvertently repeats the mistakes of prior thinking. For example, we are very optimistic about the development of positive psychology (Seligman & Csikszentmihalyi, 2000). But looking only at the positive side of phenomena is likely to be as restrictive as looking only at the negative side. Ultimately, psychologists have to learn, as they have in the past, that a synthesis is needed to integrate a thesis and its antithesis. Neuroscientific approaches to cognition are proving to be quite useful, and the overwhelming number of jobs being offered in the cognitive neuroscience area suggests that this trend has taken hold across many departments of psychology. But cognitive neuroscience, like any other approach, answers some questions but not others. It is probably less useful than traditional cognitive approaches, for example, in suggesting to teachers how they can improve student learning. Teachers can benefit from knowing about the hazards of massed versus distributed practice or of retroactive and proactive interference. It is less clear how they can benefit, at this time, from knowing the part of the brain in which performance on a particular cognitive task is localized. Eventually, they may well be able to benefit. In the meantime, new approaches will continue to emerge, and they will have in common with current and past approaches that they answer some questions well, other questions poorly, and still other questions not at all.

We must admit to one fact: Unified movements will eventually fail too, in a sense. No movement lasts forever. However, what a unified movement is in the best position to do is to plant the seeds for its successors. For example, a unified approach to prejudice will reveal what questions cannot be answered with any available paradigms or methods and will help force psychologists to think of new ways to answer the questions that are recalcitrant under any available approach.

The Field of Psychology Is Not Well Set Up for the Propagation of Unified Psychology

Psychology departments are typically organized by fields. Graduate study is typically organized by fields. Often, many members of a given field within a given department share a common paradigm or methodological approach. Many awards and prizes within the field of psychology are organized by fields. Journals and granting organizations often divide themselves up by fields. Even divisions of the American Psychological Association are organized, to a large extent, by fields. There inevitably will be substantial vested interest in maintaining current systems for organizing old knowledge, discovering new knowledge, and propagating both kinds of knowledge. Therefore, we do not expect many immediate converts and suspect we will hear in the near future many reasons why the current system is the best system. People who profit from a system rarely wish to give it up! Eventually, of course, we hope that there will be many converts to the notion of unified psychology and that they, too, will wish to maintain their views. They

will have one advantage, perhaps, over some others: They may be flexible enough to synthesize the new views with their existing old ones.

One of the Biggest Problems Is That People May Think They Practice Unified Psychology When in Fact They Do Not

Virtually everyone wishes to see him- or herself as open-minded and, moreover, as someone who is not locked into any one stifling way of doing things. Therefore, many people may believe they already practice unified psychology. But the organizational issues described above with respect to the field of psychology make it unlikely that this is the case. The field of psychology currently is organized, as we have discussed, to promote the individual disciplines much more than the unified study of phenomena. Indeed, examples abound of how work that falls or people who fall between the cracks can suffer. The people without a specialization recognized in the current system of psychology may find themselves locked out of jobs, journals, grants, prizes, and other aspects of the meager reward system psychology has to offer. Some people may well be termed *eclectic* for their use of a variety of ideas or techniques, but they may not sufficiently synthesize them to truly be unified psychologists. At the same time, some scholars may well practice unified psychology, and, of course, we hope they will diffuse their perspective to many others as well.

It is easy to become a unified psychologist. One need adhere to no particular set of methods, to no particular field, and to no particular paradigm. Indeed, the first step is precisely adhering to none of the above. We hope that many psychologists might find such a nonrestrictive way of thinking attractive. If any or all wish to view unified psychology as old wine in new bottles, we remind them that, so often, old wines are the best of all but that old bottles—sometimes with lead in their foil or corks that have rotted—usually are not the best. So we will be very happy if, after all, some decide that unified psychology is a vintage old wine in a new and better bottle. And we will be even happier if people drink of it.

REFERENCES

Allport, G. W. (1929). The composition of political attitudes. *American Journal of Sociology*, 35, 220–238.

Anastasi, A. (1990, August). *Are there unifying trends in the psychologies of 1990?* Invited address presented at the 98th Annual Convention of the American Psychological Association, Boston, MA.

Baldwin, J. M. (1902). *Development and evolution*. New York: Macmillan.

Baldwin, J. M. (1906). *Social and ethical interpretations in mental development: A study in social psychology*. New York: Macmillan. (Original work published 1897)

Berlin, I. (1953). *The hedgehog and the fox*. New York: Simon & Schuster.

Bevan, W. (1982). A sermon of sorts in three plus parts. *American Psychologist*, 37, 1303–1322.

Bevan, W. (1991). Contemporary psychology: A tour inside the onion. *American Psychologist*, 46, 475–483.

Bevan, W. (1994). Plain truths and home cooking: Thoughts on the making and remaking of psychology. *American Psychologist*, 49, 505–509.

Brody, N. (2000). History of theories and measurements of intelligence. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 16–33). New York: Cambridge University Press.

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 1, pp. 993–1028). New York: Wiley.

Cairns, R. B. (1998). The making of developmental psychology. In W. Damon (Series Ed.) & R. B. Lerner (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 1, pp. 25–105). New York: Wiley.

Carroll, J. B. (1982). The measurement of intelligence. In R. J. Sternberg (Ed.), *Handbook of human intelligence* (pp. 29–120). New York: Cambridge University Press.

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge University Press.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cooper, L. A., & Regan, D. T. (1982). Attention, perception, and intelligence. In R. J. Sternberg (Ed.), *Handbook of human intelligence* (pp. 123–169). New York: Cambridge University Press.

Deary, I. J. (2000). Simple information processing. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 267–284). New York: Cambridge University Press.

DeGroot, A. D. (1989, April). *Unifying psychology: Its preconditions*. Address presented at the Fourth International Congress of the International Association of Theoretical Psychology, Amsterdam, the Netherlands.

Dovidio, J. F., & Gaertner, S. L. (2000). Aversive racism and selection decisions: 1989 and 1999. *Psychological Science*, 11, 315–319.

Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the nature of prejudice: Automatic and controlled processes. *Journal of Experimental Social Psychology*, 33, 510–540.

Estes, W. K. (1982). Learning, memory, and intelligence. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 170–224). New York: Cambridge University Press.

Fowler, R. D. (1990). The core discipline. *American Psychologist*, 45, 1–6.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. (1992). Scientific psychology: Should we bury it or praise it? *New Ideas in Psychology*, 10, 179–190.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

Garner, W. R., Hake, H. W., & Erikson, C. W. (1956). Operationism and the concept of perception. *Psychological Review*, 63, 149–159.

Green, C. D. (1992). Is unified positivism the answer to psychology's disunity? *American Psychologist*, 47, 1057–1058.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4–27.

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Rosier, M. (2000). Prologue to a unified theory of attitudes, stereotypes, and self-concept. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 308–330). New York: Cambridge University Press.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74, 1464–1480.

Guilford, J. P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.

Hegel, G. W. F. (1931). *The phenomenology of the mind* (J. D. Baillie, Trans., 2nd ed.). London: Allen & Unwin. (Original work published 1807)

Kalmar, D. A., & Sternberg, R. J. (1988). Theory knitting: An integrative approach to theory development. *Philosophical Psychology*, 1, 153–170.

Kendler, H. H. (1970). The unity of psychology. *The Canadian Psychologist*, 11, 30–47.

Kendler, H. H. (1987). A good divorce is better than a bad marriage. In A. W. Staats & L. P. Mos (Eds.), *Annals of theoretical psychology* (Vol. 5, pp. 55–89). New York: Plenum.

Kimble, G. A. (1989). Psychology from the standpoint of a generalist. *American Psychologist*, 44, 491–499.

- Kimble, G. A. (1994). A frame of reference for psychology. *American Psychologist*, 49, 510–519.
- Koch, S. (1981). The nature and limits of psychological knowledge: Lessons of a century qua "science." *American Psychologist*, 36, 257–269.
- Krech, D. (1970). Epilogue. In J. R. Royce (Ed.), *Toward unification in psychology: The first Banff Conference on Theoretical Psychology* (pp. 297–301). Toronto, Ontario, Canada: University of Toronto Press.
- Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago: University of Chicago Press.
- Kuhn, T. S. (1991, November). *The problem with the historical philosophy of science* [The Robert and Maurine Rothschild Distinguished Lecture]. Address presented to a meeting of the History of Science Department, Harvard University, Cambridge, MA.
- Kukla, A. (1992). Unification as a goal for psychology. *American Psychologist*, 47, 1054–1055.
- Kuo, Z.-Y. (1967). *The dynamics of behavior development*. New York: Random House.
- Kuo, Z.-Y. (1976). *The dynamics of behavior development: An epigenetic view*. New York: Plenum.
- Laboratory of Comparative Human Cognition. (1983). Culture and cognitive development. In P. Mussen (Series Ed.) & W. Kessen (Vol. Ed.), *Handbook of child psychology* (4th ed., Vol. 1, pp. 295–356). New York: Wiley.
- Langer, E. J. (1997). *The power of mindful learning*. Needham Heights, MA: Addison-Wesley.
- Larson, G. E., Haier, R. J., LaCasse, L., & Hazen, K. (1995). Evaluation of a "mental effort" hypothesis for correlations between cortical metabolism and intelligence. *Intelligence*, 21, 267–278.
- Leary, D. E. (2001). One big idea, one ultimate concern: Sigmund Koch's critique of psychology and hope for the future. *American Psychologist*, 56, 425–432.
- Lerner, R. M. (1998). Theories of human development: Contemporary perspectives. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 1, pp. 1–24). New York: Wiley.
- Lohman, D. F. (2000). Complex information processing and intelligence. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 285–340). New York: Cambridge University Press.
- MacIntyre, R. B. (1985). Psychology's fragmentation and suggested remedies. *International Newsletter of Paradigmatic Psychology*, 1, 20–21.
- Mackintosh, N. J. (1998). *IQ and human intelligence*. Oxford, England: Oxford University Press.
- MacLulich, A. M. J., Seckl, J. R., Starr, J. M., & Deary, I. J. (1998). The biology of intelligence: From association to mechanism. *Intelligence*, 26, 63–73.
- Magnusson, D. (2000). The individual as the organizing principle in psychological inquiry: A holistic approach. In L. R. Bergman, R. B. Cairns, L.-G. Nilsson, & L. Nystedt (Eds.), *Developmental science and the holistic approach* (pp. 33–47). Mahwah, NJ: Erlbaum.
- Maher, B. A. (1985). Underpinnings of today's chaotic diversity. *International Newsletter of Paradigmatic Psychology*, 1, 17–19.
- McNally, R. J. (1992). Disunity in psychology: Chaos or speciation? *American Psychologist*, 47, 1054.
- Messer, S. B. (1988). Philosophical obstacles to unification of psychology. *International Newsletter of Uninomic Psychology*, 5, 22–24.
- Royce, J. R. (Ed.). (1970). *Toward unification in psychology: The first Banff Conference on Theoretical Psychology*. Toronto, Ontario, Canada: University of Toronto Press.
- Rychlak, J. F. (1988). Unification through understanding and tolerance of opposition. *International Newsletter of Uninomic Psychology*, 5, 113–115.
- Sameroff, A. J. (1983). Developmental systems: Contexts and evolution. In P. H. Mussen (Series Ed.) & W. Kessen (Vol. Ed.), *Handbook of child psychology* (4th ed., Vol. 1, pp. 237–294). New York: Wiley.
- Sameroff, A. J., & Bartko, W. T. (1998). Political and scientific models of development. In D. Pushkar, W. M. Bukowski, A. E. Schwartzman, D. M. Stack, & D. R. White (Eds.), *Improving competence across the lifespan* (pp. 177–192). New York: Plenum.
- Schneirla, T. C. (1957). The concept of development in comparative psychology. In D. B. Harris (Ed.), *The concept of development* (pp. 78–108). Minneapolis: University of Minnesota Press.
- Scott, T. R. (1991). A personal view of the future of psychology departments. *American Psychologist*, 46, 975–976.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5–14.
- Serpell, R. (2000). Intelligence and culture. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 549–580). New York: Cambridge University Press.
- Sherif, M., Harvey, L. J., White, B. J., Hood, W. R., & Sherif, C. W. (1988). *The Robber's Cave experiment: Intergroup conflict and cooperation*. Middletown, CT: Wesleyan University Press. (Original work published 1961)
- Spearman, C. (1927). *The abilities of man*. London: Macmillan.
- Staats, A. W. (1983). *Psychology's crisis of disunity: Philosophy and method for a unified science*. New York: Praeger.
- Staats, A. W. (1991). Unified positivism and unification psychology: Fad or new field? *American Psychologist*, 46, 899–912.
- Staats, A. W. (1993). Separatism with unification. In H. V. Rappard, P. J. Van Strien, L. P. Mos, & W. J. Baker (Eds.), *Annals of theoretical psychology* (Vol. 9, pp. 155–164). New York: Plenum.
- Staats, A. W. (1999). Unifying psychology requires new infrastructure, theory, method, and a research agenda. *Review of General Psychology*, 3, 3–13.
- Sternberg, R. J. (Ed.). (1982). *Handbook of human intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1990). *Metaphors of mind: Conceptions of the nature of intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1997). *Successful intelligence*. New York: Plume.
- Sternberg, R. J. (1999). A dialectical basis for understanding the study of cognition. In R. J. Sternberg (Ed.), *The nature of cognition* (pp. 51–78). Cambridge, MA: MIT Press.
- Sternberg, R. J. (Ed.). (2000). *Handbook of intelligence*. New York: Cambridge University Press.
- Sternberg, R. J., & Grigorenko, E. L. (1999). In praise of dilettantism. *APS Observer*, 12(5), 37–38.
- Sternberg, R. J., & Grigorenko, E. L. (2001). The misorganization of psychology. *APS Observer*, 14(1), 1, 20.
- Sternberg, R. J., Grigorenko, E. L., Ferrari, M., & Clinkenbeard, P. (1999). A triarchic analysis of an aptitude–treatment interaction. *European Journal of Psychological Assessment*, 15, 1–11.
- Thelen, E. (1992). Development as a dynamic system. *Current Directions in Psychological Science*, 1, 189–193.
- Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action*. Cambridge, MA: MIT Press.
- Thelen, E., & Smith, L. B. (1998). Dynamic systems theories. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 1, pp. 563–634). New York: Wiley.
- Thurstone, L. L. (1938). *Primary mental abilities*. Chicago: University of Chicago Press.
- Vernon, P. A. (1997). Behavioral genetic and biological approaches to intelligence. In H. Nyborg (Ed.), *The scientific study of human nature: Tribute to Hans J. Eysenck at eighty* (pp. 240–258). Oxford, England: Pergamon/Elsevier Science.
- Vernon, P. A., Wickett, J. C., Bazana, P. G., & Stelmack, R. M. (2000). The neuropsychology and psychophysiology of human intelligence. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 245–264). New York: Cambridge University Press.
- Viney, W. (1989). The cyclops and the twelve-eyed toad: William James and the unity–disunity problem in psychology. *American Psychologist*, 44, 1261–1265.
- Wapner, S., & Demick, J. (1989). A holistic, developmental systems approach to person–environment functioning. *International Newsletter of Uninomic Psychology*, 8, 15–30.
- Wertheimer, M. (1988). Obstacles to the integration of competing theories in psychology. *Philosophical Psychology*, 1, 131–137.
- Woodward, W. R., & Devonis, D. (1993). Toward a new understanding of scientific change: Applying interfield theory to the history of psychology. In H. V. Rappard, P. J. Van Strien, L. P. Mos, & W. J. Baker (Eds.), *Annals of theoretical psychology* (Vol. 9, pp. 87–123). New York: Plenum.