PROFESSIONAL SCHOOL PSYCHOLOGY, 3(2), 145–151

Diagnosis Diagnosed: A Systemic Reaction

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I agree completely with Joel Meyers's opening statement that "A dramatic shift is needed so that psychoeducational assessment will lead to intervention designed to facilitate learning and adjustment. Two changes must take place: (a) a shift in the conceptual models that underlie assessment and (b) new assessment techniques that lead directly to intervention strategies." But I am not as optimistic that such changes will come about. When it comes to diagnosis, the schools have minds of their own. Mere logic and research data will not change the role of school psychology, because the problem is not one of science but of values. The first part of this reaction article addresses the scientific aspects of the proposed assessment model, and the second part addresses the values aspect.

ASSESSING COGNITIVE EVENTS

Think aloud protocols are important tools in assessing and studying certain kinds of behavioral events (Alessi & Kaye, 1983, pp. 33-36). When behavior is assessed, the important variables are either public (i.e., directly observable by others) or private (i.e., not directly observable by others). Variables may be private for several reasons: (a) they have occurred in the past, and are thus not accessible to current measurement technology; (b) they occur inside the skin, and thus cannot be seen directly by outside observers; and (c) they occur outside the skin, but only when others are not observing. The public-private distinction suggests four general conditions under which behavior must be studied. In the first condition, both the responses and the functional stimuli (antecedent and consequent) are public. These situations present the fewest obstacles to a science of behavior. In the second condition, the functional stimuli are public, but the responses are private. Conversely, in the third condition, the responses are public, but the functional stimuli are private. These conditions increase the obstacles to a scientific analysis of behavior. In the fourth condition, both the responses and the stimuli of which the responses are a function of are private. This condition presents the greatest challenge to a scientific analysis. The study of cognitive events faces all the challenges presented by the last three conditions. The challenge is met by finding valid indirect measures when direct measures are not obtainable.

Science does not proscribe study of events that cannot be directly observed or manipulated. Nuclear physics and astrophysics provide instructive examples of branches of science that have been developed primarily on indirect measurement and manipulation techniques. Almost all the knowledge gained about the structure, composition, and evolution of the galaxies has been gleaned from indirect measures (i.e., the electromagnetic radiation received on Earth). How can astrophysicists learn

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so much from what appears to be a simple and indirect source of data? The answer lies in how much physicists know about electromagnetic radiation from Earth laboratories, and how cleverly they can extrapolate such knowledge to analyses of radiation received from space. The speed of light, the Doppler Effect, principles of fusion, gravitational effects on the path of light, spectrography, and many other facts, principles, and techniques learned in the laboratory provide physicists with the tools necessary to infer conditions that existed at the distant source of the radiation now being received on Earth. Without a solid body of knowledge gained through direct observation and manipulation in the laboratory, there would be no basis from which to extrapolate when studying stellar radiation. The validity of such extrapolation is based on the assumption that merely because distant bodies cannot be measured and manipulated directly does not imply that different principles of physics are required.

The study of cognitive events in psychology would be enhanced by following this venerable scientific tradition. Just because private events (e.g., cognitions) cannot be measured and manipulated directly does not imply that different laws of behavior are required. Cognitive events, like the stars or subatomic particles, can be studied through inference and extrapolation. Therefore, before we can understand cognitive events (covert behavior) we will need an even better understanding of noncognitive events (overt behavior). The bridge to our understanding of cognitive events will be built with the facts, principles, and techniques gained in laboratories and field-setting studies of the more overt behavioral processes. This will provide the bases for inference and extrapolation when studying cognitive behavior. Without this solid foundation, the study of cognitive events will risk slipping from psychology to "spookology" (cf. astronomy vs. astrology).

The challenge in assessing cognitive events is similar to the challenge faced by a blind person trying to assess a child for color discrimination. The color stimuli are not available (public) to the blind person, therefore, the assessor has no direct way of knowing whether or not the child's response is correct. A solution to the problem could involve using stimuli that are public to the blind person and are also highly correlated with the color stimuli that are public to the child. Thus, braille notes could be placed on the back of the color cards. Assuming the child does not know braille and attends to the color stimuli rather than the braille, the blind person could now teach the child color discriminations without being able to discriminate colors themself.

In similar ways school psychologists could study cognitive events without being able to assess them directly. When the stimuli relevant to an overt behavior are private, psychologists need to apply basic research findings on public stimuli and overt behaviors that are highly correlated with those private stimuli. Inferences about suspected private stimuli can then be made from this knowledge base about the observed, correlated public stimuli and overt behaviors. Likewise, when the behaviors of interest are covert, psychologists need to apply basic research findings on overt behaviors that occur collaterally with the covert behaviors. Inferences about suspected covert behaviors can then be made from this knowledge base about the observed, overt collateral behaviors. Unless we first study the overt or public side of these relations, we cannot extrapolate or infer the unknowns on the covert or private side.

The think-aloud protocols allow one to obtain overt responses that are (presumably) collateral to certain covert responses. Complex think-aloud sequences allow one to infer complex cognitive routines (cf. Engelmann & Carnine, 1982, chapters 17 & 21). Oral reading responses have been used in a similar way as a basis for inferring covert reading responses. Having a child read or point under words as another child

infer the presence of covert responses (silently reading along). Of course, the validity of conclusions depends on the validity of the collateral relations.

Error-pattern analysis procedures (Ashlock, 1986) allow one to infer from correlated public stimuli the cognitive routine used to produce the wrong answers. Applications to mathematics provide the clearest examples of the benefits of this technique.

Neuropsychological assessment is based on the validity of the correlations between the patterns of overt responses made to public test stimuli presented by the examiner and the independent determination of neurological damage or dysfunction (a private stimulus). The private stimuli must be made public in a meaningful way before such correlations can be determined. Autoposies, computerized axial tomography (CAT), nuclear magnetic resonances (NMR), and positron emission tomography (PET) scans provice methods to make such private stimuli public.

Biofeedback techniques allow one to amplify private stimuli (e.g., muscle tension, blood flow, heart rate, blood pressure) to make them public to the subject or the examiner. These private stimuli are thought to be correlated with a variety of cognitive and emotional responses (e.g., headache, back pain). PET scan techniques may make public what have been private biological responses (e.g., brain sugar metabolism) thought to be collateral to various kinds of cognitive responses.

Assessing learning histories would be extremely helpful, but little research has been directed at this task. A breakthrough is made when school psychologists analyze the curriculum sequence through which the child travelled on the way to developing school problems. An assessment of past teaching practices used by each teacher in the sequence might prove very helpful (cf. Monteiro & Heiry, 1983; Ysseldyke & Christenson, 1987).

Assessing correlates of covert behaviors (e.g., suicide, stealing, firesetting, drug abuse) is an area in need of carefully thought out research. Certain public antecedent stimuli may be correlated with these acts, just as specific overt behaviors may occur as collateral events.

We delude ourselves when we think that we have explained a child's error patterns once we have identified faulty cognitive routines. Cognitive events are only middle links in a recursive process that winds from the environment to the child and then back to the environment. We might continue assessment until we know how the child learned the faulty cognitive routine. The danger in child assessment is that we *punctuate* reality in different ways depending on where in the process we choose to end our evaluation. When we stop at the point where we have identified factors on the child's side of the equation, we create a reality that individual child factors are responsible for most problems. When we end evaluations at the point where we have identified factors on the environmental side of the equation, we create a reality that environmental factors are responsible for most problems. The creation of different diagnostic realities is the topic of the following section.

To conclude this section on the scientific aspects of the proposed diagnostic approach, there is certainly a need to study more than overt behavior and public stimuli. However, the technology to do that must be developed carefully as an extension from what is known from the study of more readily observable phenomena. Think-aloud and related procedures may provide tools for such study. But much research needs to be done before practitioners can have confidence in interpreting the results obtained with such tools. My caution would be that school psychologists become better-educated consumers of such technology, understand the complexity of the issues involved, and not adopt cavalierly assessment procedures that have not been

VALUES IN DIAGNOSES

On the completely different theme of values, I agree with Joel Meyers that a dramatic shift in conceptual models is needed in school psychology diagnostic systems. And, I agree that what is required is a switch from an individual to a systemic (ecological) perspective. Perhaps the most important, recent discovery in school psychology in the past 50 years has been that every school pupil interacts daily with teachers, peers, a basal curriculum, parents, and school administrators. Some school psychologists now are suggesting that these factors may contribute to (and perhaps even be the source of) many pupils' school problems. But such school psychologists are only a tiny minority (cf. rump group?), and considered to be egregious radicals by their individually centered colleagues. What makes school psychologists hold so tenaciously to an individually centered conception of behavior? Could it be that giving up this schema would change the professional role in fundamental ways that neither the schools nor school psychologists are prepared to accept?

The major part of the school psychology role involves case studies to determine the sources of learning and behavior problems in school. Not only are school psychologists experts in tracking down factors contributing to such problems, but they also are bound by professional ethics to report the results objectively as they are determined. Parents trust school psychologists not to adopt assessment practices that are inherently biased in ways that could hinder, rather than help, their children. But school psychologists with an individually centered perspective may have adopted naturally, and with the best intentions, inherently biased assessment models.

When a child has difficulty learning or behaving at school, the source of the problem usually can be traced to one or more of five broad areas. First, the child may be misplaced in the curriculum, or the curriculum may contain faulty teaching routines (cf. Becker, 1986; Carnine & Silbert, 1979; Engelmann & Carnine, 1982; Silbert, Carnine, & Stein, 1981). Second, the teacher may not be implementing effective teaching and/or behavior management practices (Becker, 1986; Heller, Holtzman, & Messick, 1982; Paine, Radicchi, Rosellini, Deutchman, & Darch, 1983; Sprick, 1985). Third, the principal and other school administrators may not be implementing effective school management practices (Brookover et al., 1982). Fourth, the parents may not be providing the home-based support necessary for effective learning. Fifth, and finally, the child may have physical and/or psychological problems that may be contributing to the learning problems.

With several groups of school psychologists (about 50 each), in different areas of the country, I have replicated the following informal survey that highlights the crucial problem with current individually centered diagnostic practices. First, the psychologists were asked whether all agreed that each of the just-mentioned, five factors may play a primary role in a given school learning or behavior problem. They almost always agreed. Next, they were asked for the number of cases each had examined in the past year to determine the source of learning problems. The answer was usually about 120. Using 100 as a round number, multiplied by the group size of 50, yields about 5,000 cases studied by the group in the past year.

At the next step, the group was asked for the number of psychological reports written that concluded that the referred problem was due primarily to curriculum factors. The answer was usually none. All cases out of 5,000 examined confirmed that their schools somehow had been fortunate enough to have adopted only the most effective basal curricula.

When asked for the number of reports that concluded that the referred problem was out of 5,000 examined proved that their districts had been fortunate enough to have hired only the most skilled, dedicated, and best prepared teachers in the land.

When asked how many reports concluded that the referred problem was due primarily to school administrative factors, the answer again was none. All cases out of 5,000 examined demonstrated that their districts had hired and retained only the nation's very best and brightest school administrators.

When asked how many reports concluded that parent and home factors were primarily responsible for the referred problem, the answer ranged from 500 to 1,000 (10% to 20%). These positive findings indicated that we were finally getting close to the source of educational problems in their schools. Some children just don't have parents who are smart, competent, or properly motivated to help their children do well in school.

Finally, I asked how many reports concluded that child factors were primarily responsible for the referred problem. The answer was 100%. These 5,000 positive findings uncovered the true weak link in the educational process in these districts: the children themselves. If only these districts had better functioning children with a few more supportive parents, there would be no educational difficulties.

As an addendum, I offered informal data collected in local Individual Educational Planning Committee (IEPC) meetings that suggest that family factors are invoked most often when the parent does not attend the meeting or if the parent is involved in a way deemed inappropriate by the school staff. Otherwise, child factors alone seem to carry the explanatory burden for school learning and behavior problems.

One does not need complex statistical analyses to know that these results are significant beyond the .0000001 level. The set of all cases studied by these school psychologists comprises a needs assessment for their districts. And, the results indicate clearly no need to improve curricula, teaching practices, nor school administrative practices and management. The only needs involve somehow improving the stock of children enrolled in the system, and some of their parents. But, it is equally unclear how school psychologists can help resolve this kind of problem. School psychologists seem to define school problems in ways that cannot be resolved.

At this time, of course, many psychologists raise their hands to protest that all five areas are indeed responsible for problems in cases they have studied, but that informal school policy (or "school culture") dictates that conclusions be restricted to child and family factors. Many feel that they could lose their jobs were they to invoke school-related factors. Certainly, they claim, their professional lives would be made very uncomfortable. Others note that not all evaluations determine that serious problems exist. But the fact remains that no school psychologist in the group had determined that any existing problems were due to school-related factors.

School psychologists, however, appear to have come by their child-as-the-problem biases quite honestly. The bias trail leads back to graduate training programs. Graduate core requirements in school psychology programs usually focus on child factors to the virtual exclusion of school-related factors. Workshop and paper presentations at school psychology conferences share the same restricted focus. Articles in the leading journals focus on child factors.

Textbooks also stipulate the child-as-the-problem bias. An informal survey of a few widely adopted texts on diagnosing reading problems yields the following results. Sources are not referenced out of respect for the authors, but the reader can find similar results by quickly surveying texts off the shelf. The first text devotes 4 pages (7% of total coverage) to school factors related to reading problems, 2 (3%) pages to home factors, and the remaining 55 pages (90%) to child factors. The second text

pages to home factors, and 22 pages (96%) to child factors. A third text devotes 0 pages to school factors related to reading problems, 0 pages to home factors, and 250 pages (100%) to child factors. A fourth text devotes 10 pages (4% of total coverage) to school factors related to reading problems, 9 pages (3%) to home factors, and 237 pages (93%) to child factors. The classic book on reading disability edited by Money (1962) does not include chapters addressing school or home factors related to reading problems. All chapters focus on child factors.

There are isolated and recent exceptions to this long-standing bias. Carnine and Silbert's (1979) reading text devotes almost no space to the discussions of child factors (other than preskills) and close to 100% of coverage to school-related factors (teaching and instructional management). The Silbert, Carnine, and Stein (1981) mathematics text follows this same general formula.

The widely adopted textbooks, however, also may have come by the child-as-the-problem bias honestly. Texts cannot review school factors unless researchers select those kinds of factors to study. Perhaps the proportions of pages included in these texts represent fairly the amount of research available in each respective area.

A comprehensive review by Arter and Jenkins (1979) of process models for explaining and treating learning problems indicates how extensively the child-as-the-problem bias pervades our research and practice. The continued wide use of such process models, in spite of clear evidence that they not only are invalid but also ineffective, indicates the persistence with which such biases are held. Coles (1978) presented an extensive review of the research on learning disabilities. He noted with some surprise that of the approximately 1,000 studies reviewed, not one examined the relation between school factors and learning disabilities. Most studies examined child factors, some home factors, and a few both child and home factors. Coles suggested that such an extensive research literature focusing on child and home factors, to the exclusion of school factors, could be interpreted as pointing to some kind of conspiracy by researchers against examining school factors as they relate to school learning problems.

Educational researchers, however, also may have come by the child-as-the-problem bias honestly. Perhaps school administrators (or teacher unions) are reluctant to permit researchers to study school factors as they relate to learning and behavior problems. Perhaps researchers are only approved for projects that focus on child and home factors. Reports from school psychologists in the informal surveys just cited seem to support this interpretation.

Recently, however, educational researchers have produced very valuable data on school factors and learning (cf. Becker, 1986; Brookover et al., 1982; Carnine 1978; Heller, Holtzman, & Messick, 1982). As this body of research grows, school psychologists will increasingly face the burden of deciding whether they work for the schools or for the children, in cases where the interests clash.

We end with a discussion of the ethical burdens on school psychologists to be forthright and honest when reporting their findings. Are we really helping children by concluding that children alone are responsible for educational problems? Are we helping the school system at the expense of the children? How do we balance the rights of those who pay for our services against the rights of those who receive our services, when interests clash? Is the role of the school psychologist to label children to help schools avoid improving faulty educational practices, or to help schools improve faulty educational practices to avoid labeling children?

In this social context, I think Joel Meyers's proposed model will benefit school psychology if the ecological and systemic aspects are embraced. I think it will be transformed into "old wine in new bottles" if emphasis is refocused exclusively on the individually centered aspects (e.g., cognitive factors).

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Received April 9, 1987
Final Acceptance April 13, 1987