LETTERS TO THE EDITOR

Letters can provide a lively dialogue between a journal's authors and its readers. We encourage your comments on what you read in AJOT. Letters accepted for publication are subject to editing.

Sensory Integration as Neurophysiology

Since the publication of Professor Posthuma's recent editorial entitled "Sensory Integration: Fact or Fad" (1), a number of people have reported that her ambiguous acknowledgment leaves the impression that she supports the ideas she expresses. Since this is far from being the case, I wish to continue the discussion she initiated.

The basic misconception, which our conversations apparently did not dispel, is that sensory integration is essentially a technique or a method. Basically, as used by scientists (2, 3), sensory integration refers to the neurological process by which sensory data of all kinds are organized into meaningful information. Since this neurological process is an integral part of all human function, its applicability can hardly be restricted to children or to "patients" of any one kind. Rather, the knowledge of this branch of neurophysiology should illuminate and facilitate the treatment of any patient.

Throwing a ball (to use an activity cited by Posthuma) has obvious recreational values; usually, it also involves socialization. It could be used as a means of increasing grip strength or improving strength in elbow extensors. It also involves maintaining trunk stability, visually focusing on a target, aiming, and releasing grip. Thus, any given activity can be used in many ways, usually several purposes being served by one "method" or "technique." The therapist's knowledge of sensory integration principles can only serve to make his or her choice of "techniques" more appropriate and effective.

No one would dispute that study and special training in sensory integration theory is necessary and desirable. However, this fact should not be used as an excuse for failing to teach the basics to undergraduates. Special training is needed to work with head trauma victims, spinal cord injuries, hand injuries, or burns. Yet no one is suggesting that therapists abandon these types of practice until specialty post-graduate courses are widely available. The basis of sensory integration theory could and probably should be taught at an undergraduate level as part of a neurophysiology course. Then therapists would at least have the foundation on which to build further training. At a time when positions in pediatrics and geriatrics are growing rapidly in number, it is unthinkable that therapists may not have knowledge about sensory integration, which is particularly useful in these two fields of practice (4).

Since Professor Posthuma singles out for criticism the use of sensory integration theory with chronic schizophrenic patients, let us examine some of her statements in the light of reality. First of all, cost effectiveness is a strange and dangerous issue for a therapist to bring up because there is little evidence for the cost effectiveness of any kind of occupational therapy in psychiatry. The study by Linn, et al. (5) is an important step in this direction, but it does not answer the question about what kind or kinds of occupational therapy were effective in a day treatment program. Also, one might ask, how do you assess the value versus the cost of improvements in quality of life?

I believe that Posthuma errs when she assumes that therapists do not spend substantial amounts of time with chronic schizophrenic patients. Since this population comprises a large percentage of state hospital populations and an even larger fraction of boarding home and day treatment patients, therapists in these centers are spending much of their time with a chronic schizophrenic population. The use of sensory integration theory to facilitate the treatment of chronic schizophrenic patients rarely involves one-to-one treatment. Use of groups is the usual method. Professor Posthuma witnessed group activities, yet she chose to assume that one-to-one treatment was the usual. She states: "If, following any type of intensive therapy it could be shown that participating patients were able to be transferred from costly hospital beds to less costly boarding homes or to other community facilities, then perhaps the treatment could be considered cost effective." This is exactly the outcome (6) that sparked initial enthusiasm for sensory integration as a theoretical framework for facilitating treatment of those with chronic schizophrenia.

The fact that research efforts to date have not clearly and unequivocally supported the efficacy of sensory integration theory in the treatment of chronic schizophrenic patients is hardly a reason to discard it unless we also are ready to discard all of the other treatment strategies that are
Unsupported by statistical data. It might be added that other professions are in a position no stronger than that of occupational therapy, since medication is the only therapy in psychiatry that is unequivocally effective in a statistical sense.

Postuma identifies sensory integration as among the techniques or methods from which occupational therapists may choose. If occupational therapists are only users of techniques and methods, then they are technicians, not professionals. If, however, therapists become knowledgeable about how the human organism develops and functions, if they use knowledge from anthropology, developmental psychology, anatomy, and neurophysiology, as well as occupational therapy theory to illuminate and guide their treatment strategies, then they will truly be professionals.

REFERENCES

Lorna Jean King, OTR, FAOTA.
Phoenix, Arizona.

Interpreting Reliability Coefficients

The December 1982 AJOT article, "A Guide for Instrument Development and Validation," contains an incorrect statement regarding the interpretation of reliability coefficients. On page 796 the authors state: "Thus, if the observed reliability coefficient was .75, then .05 represents the degree of inconsistency in the measurement. The above coefficients would be interpreted as follows: 75 percent of the variance in the test was measuring the subject's actual ability, achievement, attitude, or personality, and 25 percent was due to chance or random error." The square of the reliability coefficient, not the actual coefficient attained, is used to estimate variance. Therefore, the statement on interpreting the reliability coefficients should state: "75 percent of the variance in the test was measuring the subject's actual ability, achievement, attitude, or personality, and 44 percent was due to chance or random error.

Wayne P. Pierson, Ph.D., OTR
San Antonio, Texas

Authors' Response

Dr. Pierson's suggested "correction" is erroneous. It confuses the interpretation of coefficients of alienation and determination (from regression analysis) with the interpretation of reliability estimates derived from the statistical definition of reliability. This error is commonly made by those who have not specifically studied measurement theory and instrument development.

Reliability, in classical test and measurement theory, is defined as the correlation between a test and its parallel form. Reliability coefficients (without squaring) estimate the proportion of total test variance that is accounted for by true score variance. This relationship is derived from a set of proofs contained in classical test theory (Guilford, in Theory of Mental Tests (New York: Wiley, 1950), gives a complete presentation of the classical theory of reliability. The relevant proofs can also be found in the following widely used measurement texts: Psychometric Theory (second edition), by J. Nunnally; McGraw Hill, 1978; pp 200-202; Introduction to Measurement Theory, by MJ Allen and W.M Yen, Brooks/Cole, 1979; Chapter 5, and Test Theory, by D. Magnusson: Addison-Wesley, 1967, p 66. The statements regarding the variance components associated with reliability coefficients contained in our article follow directly from this theory.

Psychometrics and other statistical areas resemble one another. but each is based on its own mathematical assumptions, proofs, and definitions. Knowledge of statistics in one domain, such as descriptive and inferential statistical work, is no guarantee of expertise in another, such as psychometrics. We recommend that prospective test developers in occupational therapy consult with qualified psychometricians. Ideally, consultants should meet the following criteria: 1. background of doctoral level coursework in test construction and measurement theory; 2. experience as a consultant on test development projects; and 3. publications related to test development. Consultation with an individual with this specific kind of...