Independence Through Activity: Mind, Body, and Environment Interaction in Therapy

(limbic system, motivation, rehabilitation)

Linda Madigan DiJoseph

Philosophy, theory, and practice are not separate entities but lie on a continuum. Our philosophy in occupational therapy speaks to purposeful activity and Man as an active being. In treatment, we must integrate philosophy and theory into practice, including the use of activity as our primary tool. We must also integrate activity into the totality of motor behavior and consider mind, body, and environment in all areas of practice.

With the current emphasis on clarification of the philosophical base of occupational therapy, many clinicians have had a difficult time trying to integrate philosophy, theory, and practice. Philosophy, however, is not some type of abstract concept that is relative to practice. Philosophy is relevant to practice. The basic philosophy of occupational therapy speaks to Man as an active being and to the use of purposeful activity. My personal definition of purposeful activity is Man's interaction with and manipulation of his environment. Environment includes person, place, and thing. Activity is therefore not limited to crafts but includes work, play, leisure, and self-care skills. I consider independence through activity to BE the practice of occupational therapy. Since I believe activity needs to be integrated into occupational therapists' value systems, I plan to discuss how and why we use activity in occupational therapy.

The theories of Rood, Bobath, Proprioceptive Neuromuscular Facilitation (PNF), and Brunstrom—timely topics in physical disabilities—have been classified many ways such as neurophysiologically based treatment techniques, neurodevelopmental techniques, neurorehabilitative and biodevelopmental approaches. The more I explore these individual theories and their techniques, the more similar they seem. They are all based, to some degree, on the use of neurophysiological mechanisms and all are directed toward eliciting a "proper motor response." Some emphasize sensory mechanisms more than others; some rely on...
reflexes or reactions more than others.

Although the techniques of these individual theories seem similar, they are not theoretically synonymous nor can they be used interchangeably. They must be taken for what they are— theories about motor recovery—and be placed into proper perspective in the totality of treatment. None of these cover all the neurobiological or bio-psycho-social aspects of the full recovery process of motor behavior. Only Rood discusses the environment as a critical factor in treatment, limiting the discussion to the effects of the physical environment on the nervous system and the relationships of the autonomic, somatic, and physiocosmological systems.

All of these theories also fail to consider the reality of the remediation of motor dysfunction and the mind's internal mechanisms relative to treatment. They may discuss the use of automatic motor responses (mistakenly termed subcortical in many instances since cortical structures are intimately involved in automatic behavior), or they may discuss cortically driven responses or voluntary motor responses. None truly considers factors such as motivation, arousal, attention, role dysfunction, or temporal adaptation and the influence of these factors on motor behavior.

To reduce complexity in practice, we tend to parcel the patient into component parts—muscle, nerve, and bone—and treat a "shoulder" or a "hand." When therapists say, "I have a stroke to evaluate this afternoon," or "I have a hand treatment this morning," are they really considering the "total person," a claim we occupational therapists often make? Are they so concerned with motor control and its neurobiological rationale that they forget about motor behavior, that is, a person acting purposefully within and upon his or her environment?

Any volitional motor act, or the intentional lack of a motor act, is an expression of a complex set of events involving the mind, the body, and the environment. Recent articles by major neuroscientists stress a mind-body link in a motor act.

Josephine Moore, in her Slagle Lecture (1), told us that "primitive" systems such as the limbic system are of prime importance to occupational therapists. She spoke of the functions of the limbic system in terms of the pneumonic MOVE, which I find tremendously significant in terms of motor behavior and mind-body interactions.

The M stands for memory, but I would expand that concept to include motivation. Behavior is based upon memory—instinctual as well as higher-level cognitive memories—and the limbic system plays a role in memory. It also appears that, neurobiologically, much of our motivation lies in the limbic system or, anatomically and physiologically, has crucial links with limbic structures.

O stands for olfaction—a significant sense in lower species, less so in Man, but certainly present as a drive for behavior.

V stands for visceral responses, particularly the integration of these with cognitive and emotional behavioral responses.

E stands for emotional tone. This is obvious in psychiatric practice, but too often overlooked in the physical disabilities arena. Moore calls this the feeding drive—not only for food but also, more importantly, for love and tender loving care (TLC). The limbic system has a biological need for TLC—or touching, or acceptance. When starved, the system will become dysfunctional, resulting in aberrant motor as well as emotional responses.

Kornhuber (2), in the early '70s, integrated the limbic system into the motor system, showing that we have strategies and tactics for moving. Limbic structures are intimately involved in decision making—what to do, when to do it, and even whether or not to do anything. Memories gained from prior experience, motivations, and emotions therefore play a large part in the production of a motor act.

Mogenson, Jones, and Yim (3), in a recent article entitled "From Motivation to Action: Functional Interface between the Limbic System and the Motor System," present a diagram of the neural mechanisms involved in translating "emotive and cognitive processes into behavioral motor responses." They proposed that initiation of movement is a result of the emotive brain and the cognitive brain—what I would like to call collectively the "mind"—projecting to function and pattern generators such as the basal ganglia, cerebellum, brain stem, and spinal motor centers, ultimately producing movement. Since it is a combination of "mind" and body resulting in a purposeful movement or activity, I would prefer to call this process and its result motor behavior.

Mogenson stresses the functional interface between limbic and motor systems in terms of the initiation of an action or goal-directed behavior. The emotive brain drives homeostatic internally based behaviors such as those resulting from hunger or thirst. The authors also state that it is responsible for initiating actions related to nonhomeostatic behaviors such as sex and rage, although I consider these homeostatic as well. The cognitive brain can also drive behavior and particularly
in Man I feel it is intimately linked with the emotive brain. As mammals, we have many if not all of the same basic drives as our pussy cats at home, but they are modified to a much greater degree by our cognitive processes including memory, logic, and knowledge of our environment and society.

To ignore the emotive and cognitive aspects of motor behavior is in essence reducing our patients—in every sense of the term reduction—to the level of functioning of MacLean's reptilian brain (4).

In 1976, in an invited lecture at the Society of Neuroscience meeting, McGee (5) spoke of mood, or motivation, and movement as "twin galaxies of the inner universe" and stressed the need to research the neural links between motivation and action. Graybiel (6), at the same meeting, suggested that evidence pointed toward a structure called the nucleus accumbens as a possible functional link between limbic system and basal ganglia, or motivation and action.

For decades occupational therapists have stressed the need to "motivate" patients. From the above citations, it appears that several neuroscientists agree that there is a functional, crucial link between motivation and action or between mind, body, and environment. In using motivation in treatment, however, we must be sure that we are actually motivating patients and not superimposing our motivation upon them.

For example, take the 80-year-old "stroke patient," or the 22-year-old patient with a high spinal cord injury who we feel should be capable of independence in ADL. They may have the required motor control, cognitive and perceptual abilities to be independent in the activity of ADL. However, if it takes an hour and a half to complete ADL tasks in the morning and the patient is so exhausted afterward that he or she cannot enjoy meaningful activities such as gardening, needlework, or even soap box operas, is independence in ADL, REALLY a realistic goal? We may have compromised quality of life for quantity of activity—activity that WE as therapists find more meaningful than soap box operas.

We must make sure that our goals for patients are reasonable, formulated not only on the basis of muscle, nerve, and bone, but also upon a combination of mind, body, and environment. Further, we must be sure these goals are reached through the use of activities that are compatible with the person and not with our own perceptions or values.

Historically, occupational therapists considered it common sense functionally to link mind and body through motivation and the use of purposeful activity. I am dismayed that some aspects of practice have recently sided with either the mind (i.e., the psychological) or the body (i.e., the motor).

The field of psychiatry has traditionally had a mind-body problem. Some believed that mental health problems were a result of a disordered "psyche." Gradually, others believed that the cause for psychosis and even neurosis had a purely organic basis—neuroanatomical or neurochemical.

A growing body of knowledge in psychiatry pertains to organic dysfunction. Some theories relate schizophrenia to disordered neurotransmitter mechanisms, the most popular being the mesolimbic-mesocortical dopamine pathway (7). Manic depressive disorders also have been linked to a disturbance of neurotransmitters.

This does not mean that we can ignore the "psyche" and merely give patients a psychotropic drug or sensory integrative activity. Instead, recent research has helped to merge the beliefs of the health care professionals and the scientists. Neuropsychiatrists, neuropsychologists, and biopsychologists now deal with the brain and behavior together, not separately.

Occupational therapy has had, and probably still has, a mind-body problem. We split into two different specialties—the psychiatric therapists who dealt primarily, if not exclusively, with the mind and the physical disability therapists who dealt primarily, if not exclusively, with the body. Although each group purported to deal with both the mind and the body (the "total person"), each had problems.

There were psychiatric therapists who were concerned about patients with either lack of movement or excessive movement. They counseled patients about their cognitive processing or "minds," hoping their bodies would take care of themselves. Other therapists focused on moving patient's bodies as well and found that their minds had improved. We have Lorna Jean King to thank for stimulating us into reuniting body and mind in occupational therapy mental health practice. She also has considerable support from the literature in treating the body together with the mind.

Lidsky, et. al. (8) have reviewed the evidence regarding implication of the basal ganglia in schizophrenia. The basal ganglia are considered primarily as motor-related nuclei, although they do have limbic connections. Lidsky states that "psychiatric patients tend to have frank motor problems characteristic of basal ganglia lesions and pathological considerations of the
basal ganglia manifest psychiatric difficulties as a major symptom."

Strom (9) is investigating links between classical psychological conditioning and the immune system and finding an increase or decrease in the immune system following conditioning. His research arose from his gut feeling that his depressed patients tended to reject skin grafts more than nondepressed patients and tended to need greater amounts of immune suppressant drugs.

Hassler (10) implicates the basal ganglia in a psychobiological explanation of compulsive mechanisms in neuroses. He feels that the "striatum has primarily psychomotor rather than motor functions." It appears that the basal ganglia are intimately involved in sensory as well as motor processes. The basal ganglia may act as a primary filtering mechanism to focus attention on the significant stimulus to be acted upon and to weed out extraneous noise.

The coming together of mind and body in mental health is exciting but there are cautions here as well. To use a sensory integrative approach exclusively and forget or ignore our traditional mental health practices is analogous to taking a dive off the opposite end of the pier—concentrating on the body and forgetting the mind and environment.

The mind-body problem in physical disabilities are reflected in the tendency to treat a "hand," a "shoulder," or a "stroke," and slighting, even ignoring, the person attached to that body part. Many times we acknowledge that the patient is lethargic, depressed, or labile, but assume the psychological problems will "go away" as motor function returns. Further, many motor problems have associated cognitive or emotional problems—multiple sclerosis, Huntington's chorea, and Parkinson's disease, for example. Talking to a recovered or semi-recovered person following a traumatic head injury makes one aware of the primary motivational problems. He or she can often relate to the experience of having a total lack of drive, can recognize it, perhaps, but is helpless to act.

New philosophies of treating motor dysfunctions are also emerging in physical disabilities. Although these are not yet "psychophysiologists," Pinelli speaks of the "inclination to be active," "psychomobility," and purposeful behavior in reference to classical central nervous system (CNS) motor problems. His message, although primarily for the neurologist, is relevant for us. He states, "A major field of clinical neurology where a revision is particularly needed is that of motor disorders. The neurologists...cannot avoid analyzing the driving kinetic primary impulses and the motivational processes..." (11) Occupational therapists have been saying this for years!

The fields of psychiatry and physical disabilities are coming closer together. The mind, the body, and the third component of what I call the triad of treatment—the environment—cannot be ignored.

No matter what the specialty, therapists are all looking for an adaptive response that can lead to competence. Adaptation implies the existence of an environment, without which we would have nothing to adapt to. Too often, however, we are overly concerned with adapting the environment, rather than using it to elicit an adaptive response, or we ignore it entirely as a "given." We have many environmental tools, from community field trips and home visits to complex factors such as color and gravity.

The effects of environment on patients are readily seen if we take the time to look. Taub (12), in his experiments with deafferented monkeys, found different types of motor behaviors when monkeys were in a closed or testing environment as opposed to an open or free environment. Many patients perform very well in the clinic but this adaptive behavior may collapse on the unit or in the home environment.

In using the environment as a therapeutic tool, we must think of it in its totality. Most therapists dealing with CNS disorders recognize the effects of gravity upon motor behavior. Most also recognize the more obvious effects of light, since motor behavior changes drastically when moving from a bright room to a dark room.

What about the environmental factor of time? We have biorhythms, circadian rhythms, sun phases, and moon phases. Some therapists in mental health recognize that behavior can change during different moon phases. (How many of you have stopped to recognize the increase in hyper or sometimes bizarre behavior during a full moon or a new moon?)

What about space? After attending a national conference for a week (or two), can you bear the thought of another crowded session? After living in a hotel room, aren't you anxious to get home to your own environment? Consider those physically disabled rehabilitation patients who live in their own "hotel room" in a rehabilitation center for 3 months or more—what type of environment do they go back to at 5 o'clock when therapists go home?

Walsh and Cummins say "much
of the therapeutic sensory input appears to be self-generated by the behavior of the recovering animal" and suggest that "perhaps one of the major tasks facing therapists is the identification and design of environments which are optimally reinforcing to those behaviors." (13) They also state that "such (environmental) therapy may represent an overlooked potential for rehabilitation in a number of settings." This is not just adapting the environment, this is using it.

Apart from the mind-body problem, occupational therapy as a whole is undergoing a revolution of its own. We are currently defining and refining our philosophical and theoretical bases. We need to expand our horizons, add new treatment techniques to our repertoire, research our new and old theories, but we need to become united as well.

We need to specialize to be truly effective, yet we need to hold on tightly to those unifying factors that make us, first and foremost, occupational therapists. King stated that "without a unifying theory to insure cohesiveness, specialization could easily become fragmentation." (14, p 429)

In the totality of occupational therapy practice we have two unifying bonds. First: because of our training, we have the ability to look at mind, body, and environment collectively; second: our ability to elicit an adaptive response through the use of appropriate stimuli, stimuli that our nervous systems interpret as meaningful. That "meaning" being, of course, purposeful activity or occupation leading to competence. I consider higher level purposeful activity (not instinctual behavior) to be a given, the hyphen in the mind-body-environment, the core of occupational therapy.

We need to look at the independence of our patients, but we also need to reassert ourselves as an independent profession. We do not need the ultrasound of the physical therapists or the verbal counseling sessions of the psychotherapists because we have the ability to use the best of all possible worlds, the triad of treatment with activity as the key to adaptive motor behavior.

We need to decide whether we are actually going to be leaders in the mind-body-environment link, since we are certainly suited for that purpose; or are we going to divide as a profession and give away our best tools to other professions such as art therapy, horticulture therapy, activities therapy, or environmental therapy because we don't want to be called "arts and crafts ladies or men"? Are we going to search so hard for scientific rationale for our procedures that in the process we give away the best and end up being, as the old saying goes, "so far behind that we think we're first"?

Those therapists in physical disabilities who do not consider the psychological aspects of disability as a major factor in treatment can take their ball (or their pulleys) and go home. Whether we practice in the areas of psychiatry, physical disabilities, or pediatrics, we are all in the same game, and the game ball goes to the therapists who consider all three aspects of Man functioning in or adapting to the world—the mind, the body, and the environment. This triad is something that occupational therapists should know de facto but often the common sense things are overlooked in the name of philosophy, theory, and scientific rationale. However, the common sense things in our history often lead us to cohesive and profound philosophy. In a practice profession such as ours, philosophy and theory become practices in futility if they are not put into action. We are a practice profession after all, guided by philosophy and theory, but "practice makes perfect."

REFERENCES