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ABSTRACT

The authors stress the importance of providing severely handicapped students with concurrent, systematic, direct, and individualized instruction both in school and nonschool environments within daily or weekly time intervals. A brief historical review of educational service delivery models for the severely handicapped is provided. These include: (1) no schools; (2) segregated private schools; (3) segregated public schools; (4) regular, but chronological age inappropriate, schools; (5) chronological age appropriate regular schools in accordance with the natural proportion; and (6) chronological age appropriate regular schools in accordance with the natural proportion and instruction in nonschool environments. Discussed are the educational implications of such learning and performance characteristics of the severely handicapped as the number of skills that can be acquired, the number of instructional trials needed to acquire skills at meaningful performance criteria, instructional inference (transfer of training), skill complexity, retention-recoupment, synthesis skills, and generative skills. The authors compare four instructional location strategies (school instruction only, consecutive instruction in first the school and then the nonschool environments, concurrent instruction in both environments, and nonschool instruction only in appropriate natural environments). For students under the age of 18 concurrent instruction is recommended, though older students should receive most or all of their instruction in the nonschool environments in which the student is expected to function. (CL)

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THE CRITICAL NEED FOR NONSCHOOL INSTRUCTION IN EDUCATIONAL PROGRAMS FOR SEVERELY HANDICAPPED STUDENTS[1]

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ABSTRACT

A brief historical review of educational service delivery models that have been or that are available to severely handicapped students is provided.[2] Seven learning and performance characteristics and some of their educational implications are discussed; and four instructional location strategies and some of the pros and cons of each are addressed.

The thesis offered is that the placement of severely handicapped students in chronological age appropriate regular schools that are both close to their homes and in accordance with the natural proportion is necessary, but is not sufficient. In addition, educational and related service personnel must provide direct, individualized, longitudinal, comprehensive and systematic instruction in a wide variety of nonschool environments. Indeed, individually meaningful nonschool environments are considered so important in the instructional hierarchy, they should be decided upon before activities, skills, materials, and measurement systems are selected.

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[2]The label "severely handicapped" refers to approximately the lowest intellectually functioning one percent of the school age population. This one percent range includes students who also have been ascribed such labels as psychotic, autistic, moderately/severely/profoundly retarded, trainable level retarded, physically handicapped, multiply handicapped, and deaf/blind. Certainly, a student can be ascribed one or more of the labels delineated immediately above and still not be referred to as severely handicapped for purposes here, as he/she may not be currently functioning intellectually within the lowest one percent of a particular age.

When the educational services that have been or that are available to severely handicapped students are examined, at least six general nonmutually exclusive phases seem reasonably salient:[3]

Phase I: No Schools

Many years ago it was generally assumed that severely handicapped students could not or should not be educated. Indeed, for health reasons many did not live past early adolescence and those that did usually were kept from public view. Thus, if they received educational services at all, they were usually provided by parents or by remarkably rare individuals who established highly personalistic bonds.

Phase II: Segregated Private Schools

In the 1940's and 1950's many parents of severely handicapped children and concerned others established private day and residential schools. In almost every state there was at least one outstanding person, either a parent of a disabled child or someone who merged with a group of such parents to establish and operate a "special school," and "place for them," a "better than an institution environment." With the advent and remarkably rapid growth of the National Association for Retarded Children (later Citizens) and with financial support coming primarily from user fees and charitable organizations, these segregated private schools proliferated.

Phase III: Segregated Public Schools

From approximately 1960 to 1980 many public agencies across our country established educational services for those formerly excluded or rejected. The overwhelming majority of these public services were confined to institutions for the retarded or to segregated public schools supported and supervised by State Departments of Mental Health or Public Instruction. This segregated public school phase peaked shortly after the passage of Public Law 94-142 in 1975 which required that all handicapped children have access to a free and appropriate public education. That is, the pervasive response to the legal requirement that educational services be available to all was to establish new and to expand old segregated public schools.

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[3]Glaring local exceptions to each phase are acknowledged.

Phase IV: Regular, But Chronological Age Inappropriate, Schools

Many whose children were excluded from public schools were quite pleased when private schools became available. Subsequently, many parents who wanted free public education were extremely pleased when segregated public schools were established. Recently, increasing numbers of parents and professionals have been carefully scrutinizing and rejecting private and public segregated schools as acceptable educational service delivery models. This rejection, in conjunction with substantial legal, advocacy, research, curriculum development and educational policy activities, has resulted in rapidly increasing numbers of severely handicapped students attending regular schools, albeit still confined to handicapped only classrooms with few, if any, interactions with nonhandicapped students. In addition, severely handicapped students who attend regular schools are often confined to elementary schools in disproportionate numbers, regardless of their chronological age. Unfortunately, nineteen and twenty year old severely handicapped students still attend the same schools as nonhandicapped students under the age of ten. Furthermore, it is not uncommon for severely handicapped students to comprise twenty or thirty percent of the population in such schools.

Phase V: Chronological Age Appropriate Regular Schools in Accordance With the Natural Proportion

Severely handicapped students, by definition, represent approximately the lowest intellectually functioning one percent of the school age population. This one percent is referred to as the "natural proportion". The effects of serving severely handicapped students in environments that violate the natural proportion substantially are almost always negative. Institution wards, sheltered workshops, segregated schools are several examples (Brown, Ford, Nisbet, Sweet, Donnellan & Gruenewald, 1982). Therefore, more and more school districts are establishing programs in chronological age appropriate rather than mental, social, emotional, motor and/or language age appropriate regular schools in reasonable accordance with the natural proportion. For many, excluding severely handicapped students from normal human options is now considered unacceptable.

Phase VI: Chronological Age Appropriate Regular Schools in Accordance With the Natural Proportion and Instruction in Nonschool Environments

Thus far, a progression from the absence of formal educational services, through segregated private and public schools, chronological age inappropriate regular schools that violate the natural proportion and chronological age appropriate regular schools that are in reasonable accordance with the natural proportion has been delineated. As experience and knowledge accrue, as communications improve, as thousands of nonhandicapped and severely handicapped persons learn to interact for the first time, and as more and more talented young people decide to pursue careers serving severely handicapped persons, the deficiencies of those educational service delivery models are becoming increasingly apparent. Progression to and through an additional phase is now in order.

Serving severely handicapped students in special classrooms in chronological age appropriate regular schools that are both close to homes and in reasonable accordance with the natural proportion is necessary, but is not sufficient. Direct instruction in a wide variety of heterogeneous nonschool recreation/leisure, domestic, vocational and general community environments must beprovided. The need for such nonschool instruction will be even more obvious when some of the learning and performance characteristics of severely handicapped students are considered cumulatively and synergically.

LEARNING AND PERFORMANCE CHARACTERISTICS

Certainly, many in our society can be referred to as severely handicapped in that they manifest significant kinds and degrees of behavioral, affective, communicative, and sensorimotor difficulties. However, if they are not functioning intellectually among the lowest functioning one percent of the school age population, they would not be referred to as severely handicapped for purposes here. At least three questions now must be asked. First, how do we know if a student is among the lowest intellectually functioning one percent of the school age population? Second, how are such low functioning students educationally different from their less disabled peers? Third, what can educators do about some of those differences?

Arriving at reasonable responses to the first question seems relatively easy. Most professionals seem comfortable gathering representative samples of actions that presumably are manifestations of valid intellectual dimensions and separating those above from those below the one percent demaraction line.

Despite such notorious difficulties as determining valid intellectual dimensions, correlational vs. causal variables ,separating the lowest functioning 1.0% from the lowest functioning 1.2%, cultural bias, practice, and instrument error, this orientation seems inbedded into the fabric of our society (Gould, 1981).

Arriving at reasonable responses to the second and third questions seems substantially more difficult. The label severely handicapped should mean that a student is different both in degree and in kind from those not so labeled. The point offered here is that when severely handicapped students are compared to nondisabled age peers, they manifest more difficulties in relation to almost all generally acknowledged learning and performance phenomena,and these difficulties must be addressed individually and constructively in educational programs. This is not to deny or to minimize the valid and extremly important attitude that while different in kind and degree intellectually, they are no different from anyone else when human dignity, constitutional rights, individual freedom and other quality of life dimensions are considered.

The Number of Skills That Can be Acquired

Over a twenty-one year period severely handicapped students can be viewed intellectually capable of acquiring fewer skills than approximately ninety-nine percent of their chronological age peers. Thus, it is extremely important that the skills taught be as developmentally meaningful and as longitudinally useful as possible. Conversely, it is extremly important that valuable instructional time not be wasted teaching unnecessary, inappropriate, or nonfunctional skills.

The Number of Instructional Trials Needed to Acquire Skills at Meaningful Performance Criteria

Generally, the more intellectually handicapped a student the more direct instructional trials that will be needed in order to acquire skills at meaningful performance criteria. Whereas a nonhandicapped student may learn to turn on a television appropriately after three instructional trials, a severely handicapped student may require one hundred trials to acquire the same skill. When providing direct instruction it is extremely important to arrange for individually and empirically determined increases in the number of trials. Time determined progression through curricula should be generally

rejected; e.g., "during the month of February we will cover shopping skills"; "We will have a six week unit on teeth brushing." Episodic or exposure activities such as "field trips", while potentially interesting and enhancing, are usually of limited instructional value. Finally, with larger numbers of instructional trials, there are correlated increases in the amount of instructional time needed. As fewer skills will be acquired in a unit of time, acquisition rates generally lower than those of nonhandicapped age peers should be anticipated.

Instructional Inference

Instructional inference refers to the empirically justifiable degree of confidence or the relative probability that a skill acquired in one environment will be performed in a different environment under similar but different circumstances. For purposes here, the phrase instructional inference encompasses such related phenomena as stimulus and response generalization; transfer of training; and performance across persons, places, instructional materials, and language cues (Baer, 1981; Reese & Lipsitt, 1970; and Williams, Brown & Certo, 1975). In general, the more intellectually handicapped a student, the less confidence one can have that the skills acquired in one environment will be performed acceptably elsewhere. Teaching a severely handicapped student with cerebral palsy to take twelve plastic eggs out of a plastic egg container and put them in a refrigerator in a simulated school kitchen is a questionable instructional practice in that little confidence is justified that similar but different skills will be utilized to transfer real eggs from a brittle styrofoam container to the refrigerator in his home. Until the generalization and transfer skills of severely handicapped students can be improved substantially, close approximations to zero instructional inference should be the general educational orientation. That is, if a teacher is concerned that a student put real eggs in his home refrigerator, he should arrange for those skills to be taught and/or performed in his home.

Before completing this cursory discussion "negative inference" must be addressed. Negative inference refers to the hope that skills acquired in school will not be performed in other environments because to do so will cause harm or embarrassment. For example, many parents would be truly hurt if they observed their twenty year old severely handicapped son clapping his hands when he is happy and he knows it at a restaurant; putting pegs in and taking them out of a peg board on a public bus; or assembling a four piece

puzzle of Donald Duck at the office picnic. Unfortunately, until educators refrain from teaching such skills we can only hope they are not performed in nonschool environments.

Skill Complexity

There are thousands of complex skills that can be acquired by nonhandicapped and less handicapped students that either cannot be acquired by severely handicapped students or are extremely cost ineffective when the return for educational investment is considered. Memorizing multiplication tables, completing long division worksheets, learning the names of the presidents of the United States, reciting the"Pledge of Allegiance to the Flag" are but a few examples. Additionally, teaching complex skills that require so much time and effort that severe curricular imbalances accrue should be minimized. Spending two hours per day learning to categorize foods into four groups at the expense of learning how to prepare a simple meal, to purchase food items at a grocery store, and to order food items from a restaurant menu is but one example. Conversely, curricular strategies that foster the cost-efficient instruction of relevant complex skills in a wide variety of school and nonschool environments should be utilized as much as possible.

Retention-Recoupment

Retention-recoupment refers to the relationship between the performance of a particular skill at specified criteria; the passage of time during which performance does not occur or occurs infrequently; decrements in performance (forgetting); and the time and instructional effort necessary to reteach performance at the original criteria. In general, the more intellectually handicapped a student, the greater will be the decrements in performance after the passage of time during which skills are not performed or performed infrequently, and the more instructional time and effort will be needed to reteach to original criteria.

Given such retention-recoupment difficulties: students should be taught skills that are appropriate for and required consistently in the nonschool environments in which they currently function; individually and empirically determined, but nevertheless relatively long-time periods in which important skills are not performed or are performed infrequently should be avoided; direct instructional services must be available on a year round basis; and close cooperation between relevant school and nonschool care providers is mandatory.

Synthesis Skills

A nonintellectually handicapped student may learn one skill as a result of math instruction, a different skill from reaching instruction, and a third from a language lesson. She is then quite capable of synthesizing those different skills and applying them toward the solution of a purchasing problem in a neighborhood grocery store. It is the rare severely handicapped student indeed who can synthesize skills learned in three different contexts and use them in a functional manner in a fourth. Difficulties in the ability to synthesize render it extremely important that direct instruction be provided in the environments and activities that inherently require synthesis. For example, a student can be taken to a grocery store, and while learning to purchase an item, he can also learn many social, math, reading, language, motor and functional object use skills.

Generative Skills

Few severely handicapped students can utilize existing skills and information to generate substantial amounts of new knowledge. These generative difficulties make it extremely important to provide direct instruction in the actual environments requiring specific practical solutions.

To summarize, hypothesize someone who can learn, but not as much as 99% of her age peers; who needs a lot more time and trials to learn and to relearn than almost all; who has extreme difficulties transferring that learned from one environment to another; who remembers some things but who forgets proportionately more than almost all others; who rarely, if ever, puts information gathered from several different experiences together so as to function effectively in a novel situation; and who has serious difficulties generating solutions to practical problems without specific training. How much of her valuable educational time should be spent in the physical space of a school and how much should be spent receiving direct, systematic, individualized and comprehensive instruction in the actual nonschool environments in which she currently functions and those in which she might function in postschool years?

FOUR INSTRUCTIONAL LOCATION STRATEGIES

One of the primary purposes of public education for severely handicapped students is to prepare them to function as independently and as productively

as possible in a wide variety of naturally proportioned nonschool and post-school environments. Given their relatively poor performance record in relation to the acquisition and performance characteristics delineated above, it is now important that issues related to "where" direct instruction is provided be discussed.

School Instruction Only

Some believe that direct instruction should be provided over a twenty-one year period only on school grounds. Indeed, the overwhelming majority of severely handicapped students receive virtually all of their education on school property. Some of the primary reasons used to justify such instruction are:

That transportation during school hours and the fiscal, scheduling, logistical, administrative, liability, and staffing difficulties associated with nonschool instruction can be avoided;

That teachers and related service personnel do not have to acquire and utilize the complex skills necessary to secure nonschool instructional sites, to establish reciprocal relationships with variety of persons functioning in community businesses and agencies, to secure the information and materials needed for instruction in those environments, or to put up with distracting noise, anonymous persons, and other interruptions that can be avoided or minimized in more controlled school buildings;

That severely handicapped students learn best when provided relatively large numbers of teaching trials in short periods of time and activities and materials appropriate for repeated practice teaching strategies are relatively easy to generate in controlled school environments;

That people in the community should not have to interact with severely handicapped students nor should the students have to suffer their ridicule and hostility; and

That some students may not be medically able to function in nonschool environments.

Conversely, a growing minority of parents and professionals have examined the longitudinal effects of School Instruction Only and have generated many

reasons for realistic alarm over the logical and empirical outcomes. Some of those are:

That School Instruction Only requires inferences that the skills learned in school will be performed acceptably in nonschool environments. Given the notorious deficiencies in such learning and performance characteristics as transfer of training, stimulus generalization, and performance across persons, places, materials, and language cues, such inferences are educationally untenable;

That many parents, siblings, taxpayers, and others who are or who might be directly responsible for severely handicapped students can become aware of their exceptional needs by observing them learning to function in many community environments. It is extremely hard to argue convincingly that ignorance of those needs results in nonhandicapped persons engaging in actions that are in the best interests of disabled persons;

That severely handicapped students learn few meaningful skills without direct instruction. Many parents, siblings, babysitters and friends either do not or cannot teach the skills needed to function in many nonschool environments. Thus, it seems reasonable that such important nonschool skills be developed directly by educational and related service personnel;

That teachers confined to schools have limited knowledge of the skills and performance requirements of nonschool environmennts or how individual students function therein. Unfortunately, many function quite well in protective, supportive, barrier-free, stimulus controlled schools, but marked performance deficiencies are noted when they are required to perform in less cloistered environments; and

That valuable dollars invested in instructional time and materials are often wasted because substantially different materials are utilized in nonschool environments and because many are taught skills that are not required anywhere else but in school.

After an examination of many of the reasons pro and con, the position offered is that School Instruction Only is educationally indefensible.

Furthermore, at least three more responsible and cost efficient alternatives are available: Consecutive Instruction, Concurrent Instruction and Nonschool Instruction Only.

Consecutive Instruction

Consecutive Instruction refers to requiring the performance skills on school grounds before allowing access to nonschool environments. For example, students are often taught to put grocery items into a grocery cart in a simulated school store utilizing pictures of food containers as cues. Once such skills are performed at acceptable criteria, opportunities to manifest them or to secure related direct instruction in real grocery stores are then afforded. Some of the major reasons for supporting such a strategy are:

That there are students who manifest serious behavior problems in many environments. It seems reasonable to gain control over potentially harmful actions in a relatively "safe" environment before allowing access to the general community;

That some students learn selected cognitive, sensorimotor, and communication skills best in well controlled environments;

That teachers can have the time and flexibility to experiment with instructional materials, teaching techniques, and behavioral interventions. Trial and error tactics would not be appropriate for real dental offices, grocery stores, and public restrooms; and

That it is more efficient to train paraprofessionals, student teachers, therapists, etc. in well supervised school environments.

Conversely, there are those who believe that providing consecutive instruction is generally unnecessary and unduly risky, and thus should be used with extreme caution, if at all. More specifically, two stage instructional strategies are inherently dangerous because many may never progress through Stage I (school) and therefore will be denied opportunities to receive critically needed instruction in Stage II (nonschool environments). Additionally, it is argued:

That too often it is falsely assumed that if significant behavior problems are manifested in school, they will also be manifested elsewhere.

A significant number of examples supportive of the position that many students behave unacceptably in one environment (school) and appropriately in another (community) are available;

That even though skills may be performed at arbitrarily determined performance criteria in school, tney may not be performed acceptably in other environments without substantial direct instruction;

That it is difficult for school personnel to determine the individually significant skills and performance criteria necessary for access to nonschool environments. Indeed, access criteria established are often arbitrary, irrelevant, and capricious; and

That community socialization is an experience necessary for all. Non-handicapped persons will never be sensitized to the problems of disabled persons if they are permitted to see only "acceptable" performance. Concomitantly, participation in a life of dignity includes taking risks, a component of which is the option to try, to fail, and to try again.

Concurrent Instruction

Concurrent Instruction refers to providing systematic, direct and individualized instruction both in school and nonschool environments within daily or weekly time intervals. Assume that the instructional objective is to teach a nonverbal, nonindependently walking, noncounting and nonreading severely retarded student to purchase five items at a neighborhood grocery store. After conducting a skill analysis, a teacher decides that it is appropriate to teach certain skills in simulation at school and certain skills in an actual grocery store. Thus, from 9:00 to 10:00 a.m. simulated instruction pertaining to how to transfer from an aluminum walker to a borrowed stainless steel grocery cart; how to match a picture on a piece of cardboard to a picture on an actual food can on a shelf; and how to communicate gesturally to a teacher aide is provided in school. From 10:30 - 12:00 the student goes to an actual grocery store and is taught not to grab items from shelves; to proceed up and down aisles in an orderly manner; to desensitize to the constantly changing colors and noises of a bustling heterogeneous community environment; to match a picture of a jar of coffee to an actual jar on a shelf; to wait in a checkout line without interfering with others; and to hand money to and receive change from a real grocery clerk. Those who utilize

concurrent instructional strategies acknowledge: that there may be skills that can be learned most efficiently in schools; and that some students seem to be able to transfer training sufficiently to benefit from some instruction in simulated environments. However, they also acknowledge:

That by both providing school and nonschool instruction within a short time frame, the risks of not progressing from school to nonschool environments are neutralized;

That the probability of simulated instruction being functionally related to the actual performance requirements of nonschool environments is maximized;

That teachers can experience the excitement and other joys of teaching meaningful skills in real environments under constantly changing circumstances;

That many nonhandicapped persons can desentitize to, can learn to help and serve, and can develop friendships with severely handicapped students;

That an educational program can make life easier and more rewarding for parents and siblings who can take advantage of, maintain, and build upon the functional skills taught in nonschool environments by school personnel; and

That respect, understanding and cooperation can be enhanced substantially if taxpayers actually see severely disabled students being taught to perform meaningful skills in real environments.

Nonschool Instruction Only

Nonschool Instruction Only refers to the provision of direct instruction only in appropriate nonschool environments in which students currently function and those in which they are being prepared to function in the immediate future. While it is doubtful that this particular strategy will gain widespread support for use with young students, it is becoming increasingly credible for those within the eighteen to twenty one year chronological age range. Some of the points used to support such a strategy are:

That the grounds of public high schools are chronological age inappropriate and can offer little to those over age eighteen that could not have been realized earlier;

That it can be clearly demonstrated to parents and others that many severely handicapped persons can function quite well in a wide variety of community environments all day;

That cooperative relationships with postschool agencies responsible for recreation/leisure, domestic living and vocational functioning can be established earlier, thereby facilitating responsible transitions from school to postschool environments.

That scarce and valuable educational dollars can be spent on the actual training needed for functioning in nonschool environments; and

That a zero inference model can be closely approximated. That is, teachers can provide instruction that does not rely on the untenable inference that training in one environment will result in acceptable performance in others.

SUMMARY AND CONCLUSIONS

After many years of struggle severely handicapped students now have access to a free and appropriate education. The thesis offered is that the benefits that can be realized in the physical space of a regular public school are necessary, but they are not sufficient. Because of inherent deficiencies in many learning and performance characteristics, direct instruction must be provided in the variety of actual least restrictive nonschool environments in which the students can currently function and those in which they most probably will function in the future. This nonschool instruction should not be construed as a "field trip" or any other kind of episodic experience. On the contrary, it should increase with chronological age and should be accompanied by the same kinds and degrees of individually meaningful instructional objectives, clearly delineated teaching and measurement strategies, and functional instructional materials vital to any instructional endeavor of reasonable quality.

As there are skills that can be developed best on a school campus and those that can be developed best elsewhere, the important and difficult task becomes that of determining the locations in which a particular skill can be taught most efficiently to an individual. In relation to this "where" direct instruction should be provided issue, the conclusions offered are:

School Instruction Only is untenable;

Consecutive Instruction, while far superior to instruction confined to school grounds, is still much less defensible than other strategies; and

Concurrent Instruction is offered as the location strategy of choice for most severely handicapped students under the age of eighteen.

Finally, the postschool environments to which severely handicapped adults are usually assigned are notorious for being unduly restrictive in nature. Sheltered workshops, activity centers, institution wards, nursing homes are examples. Thus, if a severely handicapped person is to be prepared to perform functional skills in a wide variety of habilitative nonschool environments, it is extremely important that the necessary instruction be provided as a part of a public school program. It is also abundantly clear that the teaching of skills without regard to the delicate and unique student-skill-environment ecological balance is usually meaningless. Therefore, it seems reasonable that from ages eighteen to twenty-one, most, if not all, direct instruction should be provided in the wide variety of habilitative nonschool environments in which a student will most probably function at graduation.

References

Baer, D.L. Promoting generalization of treatment effects with children: Issues and strategies. Paper presented at the 15th annual convention of the Association for the Advancement of Behavior Therapy, Toronto, November, 1981.

Brown, L., Ford, A., Nisbet, J., Sweet, M., Donnellan, A. & Gruenewald, L. Opportunities available when severely handicapped students attend chronological age appropriate regular schools in accordance with the natural proportion. In L. Brown, J. Nisbet, A. Ford, M. Sweet, B. Shiraga & L. Gruenewald (Eds.), Educational programs for severely handicapped students. Vol. XII. Madison, WI: Madison Metropolitan School District, 1982, in preparation.

Gould, S.J. The mismeasure of man. New York: W.W. Norton Co., 1981.

Reese, H.W. & Lipsitt, L.P. Experimental Child Psychology. New York: Academic Press, 1970.

Williams, N., Brown, L. & Certo, N. Basic components of instructional programs. Theory Into Practice, 1975, 14(2), 123-136.