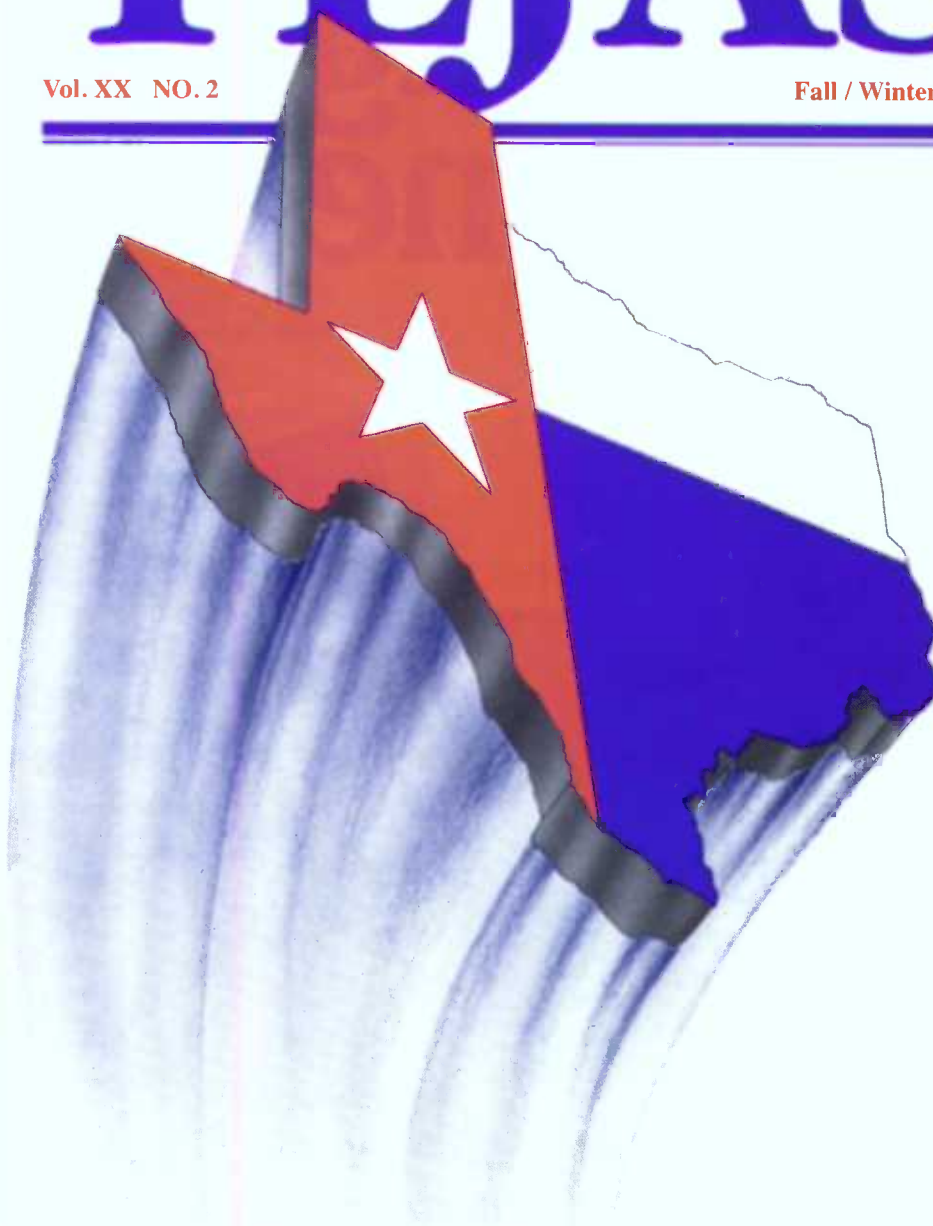
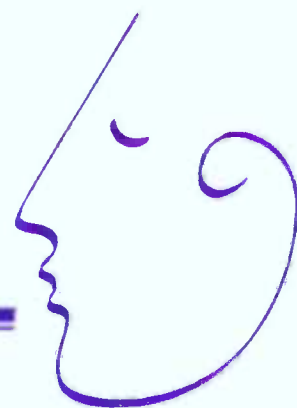


TEJAS

Vol. XX NO. 2

Fall / Winter 1994 / 1995

Texas Journal of
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and
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Pathology



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TEJAS

Volume XX, No. 2, Fall/Winter 1994/1995

TEJAS '94/'95

Larry Higdon
Managing Editor

SHARE YOUR CLINICAL SUCCESSES, RESEARCH, AND CREATIVE EFFORTS WITH THE TEJAS READERSHIP

Approximately fifty percent of each issue is devoted to the **Focus Topic**. Manuscripts in other professional topic areas are also invited. Authors may contact the Managing Editor for further information related to manuscript submissions. **Submissions must follow "APA" style. Submit manuscripts on a 3 1/2 disk with three (3) hard copies. Indicate program and directory on the disk.** All submissions are subject to peer review.

1994-1995 TEJAS

VOLUME	FOCUS TOPIC	EDITOR	PUB. DATE
XXI, No. 1	Central Auditory Processing	Sandy Friel-Patti	June, 1995
XXI, No. 2	Service Delivery in the Schools *	Julie Noel	Nov., 1995

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The First Word

Treatment Effectiveness: A Recommitment to Excellence

Jennifer Barber Watson, Ph.D.
Texas Christian University
Fort Worth, Texas

In our journey for improved services, professionals in communication sciences and disorders have found themselves on a one-way road committed to defining and documenting the effectiveness of our intervention. As indicated by the thoughts of the authors contributing to this issue of *Tejas*, the time clearly has passed where cross-roads allow us to choose whether or not we will be accountable for our services. Multiple forces have lead us to a one-way street mandating documentation of outcomes and efficacy. These forces are discussed in the articles by Pietranton, Ferguson, Anderson, and Swigert and include changing demographics, state legislative issues, industry-based reforms, and trends and reforms in education and health care. Clearly, every site providing services in the field of communication disorders has been impacted by these forces.

The contributions to this issue of *Tejas* provide great insight about the progress and developments of service providers who are traveling this road to documenting outcomes and efficacy. Two particular issues seem to emerge. First, several authors explore important considerations in determining what constitutes effective interven-

tion. That is, what is the **product** or outcome of quality services? Ferguson reminds us to consider issues of eligibility, intervention recommendations, length of services, and clinical significance when describing our "product." Pietranton also explores our accountability by reviewing outcomes in terms of cost effectiveness and functionality. She also raises the issues of whose perceptions must be considered when discussing outcomes and products. Patients and the public, payers, hospitals and health care organizations, and service providers are audiences explored in her discussions. Also, issues of outcomes must be considered within the context of the population served, including the nature of the population as well as cultural influences. Koop highlights the concerns specific to those "graduates" of the neonatal intensive care units. Anderson's case study reminds readers of essential considerations when dealing with bilingual/bicultural populations.

A second issue emerging from the contributions in this *Tejas* is the **process** for demonstrating and documenting these products or outcomes. Ferguson's discussions in this area explore data

bases, measurements over time, and prospective, concurrent and retrospective measures. Johnson discusses how medically oriented speech-language pathologists may implement a clinical data base. Pietranton delineates important considerations in setting up outcomes measurement programs. In the "Last Word," Swigert provides information about the past, current, and future efforts of the American Speech-Language-Hearing Association to develop outcome data bases. She suggests that this important work may be leading to a national outcome management system. Sancibrian provides us with an update on the efforts of our state's professional organization to complement these national activities.

In our continued efforts to provide the most effective services to our clients, we must recommit to excellence through renewed and invigorated efforts to quantify impressions and document clinical outcomes. We are fortunate to have travelers on this road to excellence such as the contributors to this issue of *Tejas*. Their thoughts, activities and progress inspire us to not idly stand by and watch their travels, but to join them on this important road.

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A Primer in Outcomes Measurements:

What are they and where did they come from?

Arlene Pietranton, Ph.D.
Director, Health Services Division
American Speech-Language-Hearing Association
Rockville, Maryland

PRETEST:

1. On the average, how many visits are needed to treat SLP/A patients/clients?
2. What percent of SLP/A patients/clients can be helped within 10 visits?
3. What documentation exists to support the cost-effectiveness of SLP/A practice parameters?
4. Where are the outcome studies for SLP/A services?

ANSWERS:

- 1 & 2 — We don't know.
3 & 4 — We don't have any.

Are these trick questions? Not to the growing numbers of audiologists and speech-language pathologists from California, Ohio, Minnesota, Maine, Florida, and a myriad of other states who are negotiating with managed care companies or state legislators.

In the minds of many, the "Era of Health Care Reform" (HCR) in which we are now immersed is long overdue. We in the United States of America are blessed with a talented and dedicated health care workforce and a remarkable array of clinical and technological resources. But we are also saddled with a "nonsystem," rift with access and coverage gaps that leave more than 37 million Americans uninsured, make pre-existing conditions an intimidating reality, and put most of us at jeopardy whenever we consider changing employers or relocating. The situation is seriously complicated by the fact that health care costs are escalating out of control. In 1960, the cost of health care in the U.S. was \$27 billion, or about 5.3% of the gross national product (GNP). Today it is approximately \$903 billion, or 16% of the GNP. At this rate of growth, by the year 2050, 100% of the United States' GNP will be consumed for health care (Banja, 1994). Obviously, we cannot continue to underwrite such health care costs.

Legislative changes for health care reform have been difficult to follow and their impact on service delivery is even more difficult to predict. What is clear, however, is that industry-based reform is already happening. Some of it focuses on service delivery or workforce models. A great deal of it addresses reimbursement and cost containment issues. One of the clear messages of health care reform in all arenas is the need to balance cost containment while closing the access and

coverage gaps. This has reframed the whole issue of accountability in health care.

Accountability is not a new concept to health care. Virtually all health care practitioners have had experience with or are currently engaged in select peer review, patient care audits, quality assurance, Joint Commission for Accreditation of Healthcare Organizations' (JCAHO) ten-step quality improvement process, or continuous quality improvement, all of which seek to answer the question "Are we doing the right things?" The professions of audiology and speech-language pathology have a long standing commitment to making sure we are "doing the right things." Our efficacy literature spans many decades and contains innumerable articles reporting well designed studies which affirm the effectiveness of our clinical assessment and intervention strategies. But the accountability quest has taken on a particular focus in the 1990's: *outcomes measurement*.

BACKGROUND

Treatment efficacy and outcomes measures, although closely related, are not one and the same. *Efficacy* can be conceptualized as an ongoing, unbroken stream of activity seeking to prove the effectiveness of clinical procedures. The efficacy of a procedure or intervention is usually established within a research framework of well-controlled conditions and as such provides evidence that a particular approach is *likely* to work in real-life (i.e., noncontrolled) situations. *Outcomes measures* are intended to relate the observed clinical changes directly to specific variables (i.e., patient/client characteristics, treatment method, provider characteristics, frequency, duration, cost, etc.) of the intervention provided - **in the real world of service delivery**.

Historically, health care quality or accountability measures have been in the process realm. Donabedian (1966) differentiates the assessment of structure, process, and outcome in this way: **structure** addresses the staffing and facilities where care takes place, along with the financial and organizational arrangements; **process** looks at what medical (health) care has been provided; and **outcome** considers the result(s) of the care, assessed in terms of survival, recovery, and restoration of function. Today health care providers are being asked to measure accountability in terms of "outcomes," which requires us to refocus our efforts. As early as 1988, Paul Ellwood and a number of other health strategists and policymakers

(Brook & Lohr, 1987; Relman, 1988; Roper et al., 1988; Schroeder, 1987) began challenging the health care field to measure outcomes. Outcomes need to be understood from two perspectives: cost effectiveness and functionality.

COST EFFECTIVENESS

"Satisfaction guaranteed," "full-year warranty," "the best value for your dollar," these time-honored concepts are among the cornerstones of the American marketplace. Now they have entered the arena of health care. It is no longer enough to show that what you do is effective; you must demonstrate the relationship between the cost involved and the benefits derived. According to Harry Wetzler, director of technology and research at the Health Outcomes Institute in Bloomington, MN, "People are recognizing that we are spending an awful lot of money on medical care and there is a subjective sense that we're not getting our money's worth, along with reports showing that providers are doing things differently with no discernible difference in outcomes" (Hengst, 1994). Health care is an industry in which clinical, scientific, and technological advances are traditionally highly valued and evolve rapidly. Now we are being challenged to prove that our methods and techniques are not only safe and effective, but that they are the *most* cost effective.

One of the pioneering (and continuing) researchers of variation in clinical practice is John E. Wennberg (currently a professor at Dartmouth University). Some of his studies in the late 1960's focused on variations in the utilization rate for specific surgical procedures, within individual states. Among his reported findings was a 250% variation in hysterectomy rate before age 70 between two locations less than 100 miles apart in the same state (Berwick, 1994). Innumerable other examples of variation across the spectrum of clinical practice have been cited regarding the number of caesarean procedures, the number of tonsillectomies, the rate of radical versus modified mastectomies, and on and on. Research in clinical practice variation has considered the relationship between the appropriateness of care and over utilization as well as under utilization. Although those relationships are not yet completely understood, it is now clear that a substantial proportion of medical and surgical care does not benefit the patient who receives that care. According to Donald Berwick, president and CEO of the Institute for Healthcare Improvement in Boston, MA,

the proportion of inappropriate care varies with the procedure, test, drug, or surgery, but is rarely less than 10%, and in some cases exceeds 50% (Berwick, 1994). Just as it is not unreasonable to ask such questions as: "Is MRI (magnetic resonance imaging), in light of its substantially greater cost, a more effective diagnostic procedure than CT (computerized tomography) scan for a given set of clinical symptoms?" or "Does surgical intervention, with a potential price tag of \$30,000 in combined hospital and professional fees, yield a better survival rate for a given cardiac condition than long-term pharmacological management?" It is not unreasonable to ask, "What kind of measurable results can be expected from audiology and/or speech-language pathology services, and at what cost?"

FUNCTIONALITY

Does it matter? Will this intervention yield meaningful and substantial benefits that make a difference in this individual's level of function in pursuing educational, vocational, or social endeavors? A useful framework for addressing the question of functionality is the World Health Organization's International Classification of Impairments, Diseases, and Handicaps (ICIDH; WHO, 1980), which shifts the emphasis from the pathology of a disease to its consequences. This classification scheme includes three levels:

1. **Impairment** - loss or abnormality of psychological, physiological, or anatomical structures or functions resulting from any cause; disturbances at the organ level; generally measurable in a laboratory or clinical setting (examples would include aphasia, phonological disorder, sensorineural hearing loss).

2. **Disability** - the consequences of the impairment in terms of functional performance and activity by the individual; a disturbance at the personal level (examples would include paraphasic errors, unintelligible verbal output, unreliable auditory perception).

3. **Handicap** - the disadvantages experienced by the individual as a result of the impairment(s) and disability(ies); reflects interaction with and adaptation to the individual's surrounding (examples would include limitations in fulfilling one's social, academic, and/or vocational roles).

One of the realities of the outcome framework to date is that it has been largely derived from the medical model, which tends to focus on the level of impairment. Medical outcomes have traditionally been in the realm of absolutes (length of stay, mortality, long-term survival, etc.). Habilitative and rehabilitative health care practitioners also work in the area of impairment, but our measurement efforts have tended to fall within the disability level. Now we need to refocus our accountability measurement efforts to achieve a balance between the disability and handicap levels. In other words, we need to develop carefully crafted measurement tools that can satisfactorily measure the improvement in communication skills and the benefits of those improvements in terms of the individual's so-

cial, academic, or vocational level of function.

APPLICATION

To begin crafting outcome measurement tools, we need to keep in mind how this information will be used, which questions need to be answered and for whom. There are at least four primary audiences with whom outcomes measures need to be used:

1. **Patients and the Public** - Among the ways outcome data could be of use to these individuals is participating in treatment decisions ("Should I have these vocal cord nodules surgically removed or undergo a program of voice therapy?") and in making purchasing decisions ("Are the benefits of these services sufficiently important to the quality of my life that I will pay the added premium to have them covered in my health insurance plan?").

2. **Payers** - Individuals and organizations in this group could use outcome data to make reimbursement and purchasing decisions ("Do we cover these services, and from which providers?") and to reduce health care costs by contracting with providers who have agreed to follow protocols that are built on the interventions that have been shown to be the "best practice."

3. **Hospitals and Health Care Organizations** - Outcome data could be put to use by these entities in establishing local guidelines (protocols, critical pathways, care maps, etc.), identifying opportunities for improvement (e.g., discovering that patients undergoing cranial base surgery who were referred to a speech-language pathologist for a postoperative swallowing evaluation demonstrate a lower incidence rate of aspiration pneumonia), achieving regulatory compliance (the Commission for Accreditation of Rehabilitation Facilities [CARF] or the Joint Commission for Accreditation of Healthcare Organizations [JCAHO]), or marketing purposes.

4. **Service Providers** - Those of us who fall into this category could use outcome data to provide objective evidence supporting the value of our services to policymakers and payers. An exciting potential use of this information for service providers is the opportunity to identify patterns of "best practice" (one treatment strategy yielding significantly better results with a given patient population than another strategy) and to objectively determine if committing treatment resources is truly effective in all cases. Such information would not only help us further refine our intervention strategies, but would also provide valuable information to share with patients and family members when developing a plan of care. Outcome data will further empower service providers to make positive, data-driven changes.

One example of the effective use of outcome data to improve the quality of care and reduce costs is a study undertaken by Maurice Gloster,

medical director and acting senior vice president of medical affairs at Sutter Hospital in Sacramento, CA. The purpose of the study was to understand why the hospital was losing money in the area of inpatient stays for ischemic stroke. They found that the average length of stay (LOS) was a half-day longer than allowed for that DRG. They also discovered that some patients who were hospitalized for an ischemic stroke were under the care of a primary care physician; others were under the care of a neurologist. Careful investigation revealed differences in the practice patterns of the two groups of physicians, including the duration of use of indwelling catheters, routine assessment of swallowing prior to oral intake, and prescription of certain medications. These variations were linked to the longer LOS. Acting on these findings, the hospital developed guidelines that Gloster describes as "informal guidelines, designed to provoke behavioral changes not mandates or cookbooks." A year later the hospital reassessed outcomes with this patient population and found that costs, LOS, nosocomial infections, and the number of inappropriate tests and drugs were all down, with no adverse effects on patient care.

CONSIDERATIONS IN SETTING UP AN OUTCOME MEASUREMENT PROGRAM

In the broad health care perspective, outcomes measures need to look at the patients' initial status, their demographics and habits, the process of treatment (what was done, who did it, how long did it take, etc.) and then determine the status at the time of discharge (or exit from treatment). Wetzler (Hengst, 1994) suggests that outcomes measures are multidimensional and need to include measures in at least these following five areas: clinical status (traditional anatomical and physiological findings); functional status (skills related to social, academic, or vocational activities); well-being (mental and emotional health, amount of pain, energy, vitality, etc.); satisfaction with care; and cost (to the patient and the system). Wetzler goes on to point out that different dimensions represent different levels of interest depending on one's vantage point. A successful outcome of a hearing aid fitting might be measured by increased confidence by the patient, improved scores on an assessment battery administered by a clinician, or an individual's return to gainful employment from the perspective of a funding agency. Clearly, a measurement tool must balance the perspectives of all the stakeholders if it is to be a valid indicator of outcomes. Many existing databases were designed to answer the questions of a different era and as such do not offer this balance.

Our professions face a challenge in crafting measurement tools to answer the questions we are being asked today.

SUMMARY

The demand for outcomes measurements is here and now. Do we, as audiologists and speech-language pathologists, have them? Not really. We have made a good start. We can provide some convincing information from our efforts to date. Are we "up to speed?" We are about as far as many of the health care professions. But we need to accept this reality and move ahead quickly. As audiologists and speech-language pathologists, we, along with all other health care providers, must be willing to objectively assess which of our procedures are most effective and efficient, and accept that we may need to do away with some procedures for which there is no proof of effectiveness. As Wetzler (Hengst, 1994) said, "Outcomes are about changing behaviors. The caregivers have to recognize that sometimes they can't pull out all the stops." Decisions regarding health care benefits, what's covered, for whom, by whom, for how long, and at what cost will be made based on outcome data. In order to guarantee that communication needs of the approximately 42 million Americans with communication impairments are recognized as a "covered service," we must have viable outcome data. In meeting this challenge, we must also keep in mind that outcome data are more than a negotiating tool. Outcomes measurement is a tool that can help health care practitioners statistically demonstrate the treatment approaches that yield the

greatest improvement for a given condition. In turn, this information should be used to develop outcome-based practice protocols that can help shape our intervention approaches, including the frequency and duration of care. Additionally, the information should be used to refine the education of new practitioners and update the knowledge base of practicing clinicians. This would give us, in effect, an unbroken clinical loop of continuous quality improvement based on objective outcome measurements. As Wetzler said, "anybody doing outcomes research today is in a pilot or exploratory phase. Nobody has it down to a turnkey situation. While there is no guarantee in any of the outcome research that health care costs will be reduced, hopefully it will enable us to have a better understanding of what we are doing with our health care dollars."

In our highly verbal, fast-paced, information-oriented culture, focusing on functional outcomes measurements is a natural for our professions where our core goal is to assure the habilitation, rehabilitation, and/or maintenance of human communication — the most essential of human functions. Let's do it!

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Gathering Outcomes Data in Texas

Sherry Sancibrian
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Do you believe that therapy works? I have asked several TSHA members that question over the last few months, and I've usually received a resounding "Yes!" However, when challenged to "prove it" most of my colleagues cited anecdotes about people who had benefited from treatment, rather than statistical documentation. Anecdotal data are useful, but our professions need more convincing efficacy data—the kind of facts and figures that can influence third-party payers and regulatory agencies.

As our country seeks to reform health care and education, our work will be subject to increasing scrutiny. Our *belief* in the effectiveness of our services will no longer be adequate. We must be ready to offer *evidence* that our services result in positive outcomes and that our consumers' dollars are being well spent. Unfortunately, we have very little data with which to answer even the most basic questions being asked by healthcare policymakers:

- What does it add to the cost of a monthly health insurance premium to cover speech and hearing services?
- How many treatment visits does the average patient need?
- How cost-effective are your practice parameters?

We have done no better or worse than some other fields in producing measurable results, but the time has come when we must be able to demonstrate quality outcomes.

ANSWERING THE CHALLENGE

ASHA and the National Institute on Deafness and Other Communication Disorders (NIDCD) cosponsored a conference on treatment efficacy in November 1993. That conference generated in-

formation which will be used by the ASHA Task Force on Treatment Outcomes and Cost Effectiveness. This Task Force, operating under Vice President Nancy Swigert, has begun compiling existing outcome information and is moving toward developing a national database.

Even though ASHA has begun to address the professions' information shortage, the TSHA Executive Board shares a sense of urgency to begin collecting data in our own state. At our meeting in July 1994, the Board voted unanimously to dedicate up to \$5,000 of the 1994-95 budget to the development and implementation of an outcome measurement system. There are many demands on TSHA's limited financial resources, but gathering outcome data is a sound investment in our future.

Typically, outcome measurement tools look at one or more of several broad areas including: clinical status, functional status, consumer satisfaction, and cost. Former TSHA Vice President Carol Venus, has developed a draft of a data collection tool which we will be working to refine. Our goal is to create an outcomes measures system that minimizes documentation so we do not burden busy clinicians with excessive paperwork. During this fiscal year, we hope to conduct a pilot study, adjust and refine our instrument, and begin to collect and analyze longitudinal data.

WHAT IS IN IT FOR ME?

Whether you work in schools, hospitals, private practice, rehabilitation agencies, universities or any other practice site, your job will be affected by the perceived value of our professions. Measurement of outcomes has the potential to provide the kind of data we need to convince policymakers that our services are valuable and should be funded.

Quite apart from the need to satisfy public scrutiny, outcomes studies may also strengthen our professions by:

- providing the kind of data consumers and professionals need to make informed choices about treatment techniques;
- updating the knowledge base of the professions;
- refining the education of new clinicians;
- providing the impetus for developing practice parameters based on measures of realistic outcome;
- showing us how to focus our human and financial resources to achieve the greatest results;
- and, preparing us to address emerging issues such as the use of support personnel and multiskilled transdisciplinary technicians.

HOW CAN I HELP?

There are several ways you can help. Share any outcome data you have already collected. Give us information about the data collection system you currently use, or have used. (ASHA is seeking feedback from anyone who used the Program Evaluation System a few years ago.) Make suggestions about the type of data collection instrument and system you think would work best. Volunteer to participate in TSHA's outcomes study. To get involved, write or call: Sherry Sancibrian, 9208 Flint Ave., Lubbock, TX 79423 (806) 742-3908.

What we do is too important to risk having bureaucracies make decisions without our input. With so much at stake, how can you afford not to participate?

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Surviving the Changing Schools: A Call for Treatment Efficacy Research

Monica L. Ferguson
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American schools are undergoing dramatic change in our changing society. School buildings may look familiar, but education is not the same. The student population is more diverse; parent expectations and demands on the educational system are increasing; the school curriculum and teaching methods are undergoing reform; and accountability is expected. Efficacy has become a major issue in our professions of audiology and speech-language pathology.

The national movement for health care reform is raising important questions regarding the appropriate length and duration of treatment, and is creating service delivery changes and restrictions. Educational reforms, initiated by Clinton's Goals 2000 and the inclusion movement, are also creating significant changes in special education. Parents and school administrators are asking if our treatment is efficacious. They want to know, "Is therapy working?"; "How long will treatment last?"; and, "What does it cost the school district?"

To survive the rapid changes in the schools and to ensure provision of appropriate services to children, we need to know that our speech-language and audiology treatment practices are making a difference. Yet, how can we reform our methods of teaching kids unless we know it works, and, how without research, can we truly know it works?

In this article, I will review the impact on education of societal trends, health care reform, and educational reform; and then I will present the challenges each brings to education. Following is a brief discussion of considerations for determining treatment efficacy with recommendations for initiating research projects in the school setting.

THE CHALLENGE FOR THE SCHOOLS

Educational trends. Cetron and Gayle (1990) offer the following trends in education which present challenges for American schools as we approach the 21st century.

1. The number of students enrolled in the public schools will increase from 40 million in the mid-1980's to 43.8 million in the year 2000.

Are we prepared to meet the changing needs of the growing number of students?

2. There will be an estimated shortage of 1 million teachers needed to fill classroom teaching positions in the current decade due to the number of teachers retiring, class size limits, and the projected increase in school enrollments.

What implications will overcrowded classrooms have for how we deliver services?

3. Annually, one million students will drop out of school, costing an estimated \$240 million in their lifetime in lost earnings and taxes. Students at-risk of dropping out will increase with rising academic standards and social problems.

How do we reform education to keep students in school? Is the education we are currently providing students meaningful?

4. One third of the school-age population will be members of culturally and linguistically diverse cultures, specifically: African American, Hispanic American, Asian American, or American Indian (including Alaskan Natives) (Scott, 1994). Additionally, the teacher population will not reflect the growing numbers of minorities in the student population.

How do we reform curricula, assessment procedures, and teaching practices to effectively educate a diverse population?

5. Education will continue to be considered the key to our country's economic growth. Yet, three-fourths of the new-hires in the workforce will be qualified for only 40% of new jobs created between 1985 and 2000.
6. Growing numbers of students entering the workforce will have inadequate skills in the areas of vocabulary, reading, and writing.

How should we reform special education services and teaching methods to adequately prepare our students?

7. As we enter an educational *perestroika* (Cetron & Davies, 1989), the demand for skilled workers in this information economy will necessitate educational reform.
8. School reform efforts will continue to have some positive impact on the American educational system throughout the 1990's, with little improvement of national averages on standardized tests.

Without a national commitment to reform schools and without the funding necessary to improve our schools, changes will come slowly. American schools will find it difficult to compete with the schools in industrialized nations.

9. The future-basic skills emphasized in schools will include the use of telecommunications technologies, knowledge in advanced science, and technical skills for problem solving.
10. The public and the legislatures will place emphasis on the outcomes of public education. Are schools assessing the out-

comes and effectiveness of special education programs (Cetron & Davies, 1989)?

11. Parents, business leaders, and other members of the community will continue to demand increased involvement in critical educational decisions; however, they are relatively uninformed about how to restructure schools. Without school-based research upon which to base educational decisions, it is difficult to effectively address the needs of our students.

HEALTH CARE REFORM

The Clinton Administration's plan for reforming health care has been hotly debated on Capitol Hill. No one is sure exactly what the final proposal will look like but we do know there will be reform of the system for delivering and reimbursing health care services. It is certain that our professional practices will be affected regardless of work setting.

There have been many proposals to reform the delivery and reimbursement of health care. It is likely that this new system of health care will be provided through a form of managed care which will closely monitor and control costs; place emphasis on quality of services; and as a large, integrated system, link reimbursement to positive treatment outcomes (Curl, 1994).

As the delivery and reimbursement system of our services is reconfigured, the nature of our practice must change. We will be expected to answer critical questions about the costs, the outcomes, and the efficacy of our services in all settings including the schools.

IMPACT OF EDUCATION REFORM

Amy Amiot, ASHA Director - Federal Regulatory Policy Division, reported to the Task Force on Treatment Outcome and Cost Effectiveness (American Speech-Language-Hearing Association, 1994) that the recent focus on education legislation has been on outcomes which has led to the justification of fees for services in the schools. For example, a longitudinal study of outcomes in special education will provide a major policy document on curriculum, resources, and outcomes. This study has been conducted over a ten-year span and tracks high school students from the ninth grade to four years after leaving high school. Other studies are currently being con-

ducted by a center in Minnesota regarding funding in special education, and how the effectiveness of services in early childhood through secondary education are measured. A number of questions are being raised regarding the nature of speech-language and audiology services provided in the schools, including:

1. Are the services provided in the schools educational or medical?
2. Who will pay for these services?
3. How should we provide services?
 - * Which service delivery models are the best?
 - * Should these models be delivered through consultation, pull-out, or direct service delivery in the classroom?
 - * What should the recommendation be for duration, frequency, and intensity of service?
 - * What size should a therapy group be?
 - * What do we know about parent and peer involvement, and the motivation of the student?
 - * What are appropriate entry and exit criteria?

We are beginning to explore the answers to these and other questions but we will need school-based data in order to make sound decisions regarding effective practices.

HOW TO DETERMINE TREATMENT EFFICACY

There are three important questions which must be asked in determining treatment efficacy: (1) When should a child be recommended for intervention?; (2) How do we determine clinically significant change? and (3) How long should therapy continue before an exit is considered? (Kamhi, 1991)

RECOMMENDATION FOR INTERVENTION

Olswang and Bain (1991) provide a discussion of the first treatment efficacy decision that the practitioner will face: When is a child able to benefit from intervention? This decision is not one that is made easily and should be based upon the professional's decision that a child can indeed benefit from the intervention. Once eligibility is determined, when should intervention be recommended?

A data-based approach is used for determining when a child can benefit from intervention. Profiling, dynamic assessment, and tracking/monitoring are the three procedures recommended to assist the speech-language pathologist in making informed decisions about when a child can benefit from intervention.

Two questions are critical in attempting to determine when to initiate intervention. First, are the communication skills of the child commensurate with other areas of development? Second, is a potential for change observed in the child?

Profiling is a method by which static assessment information can be organized and visually presented. Static assessment represents what an individual child knows at a given point in time, using such procedures as standardized tests, developmental scales, elicitation procedures, and naturalistic observations. *Dynamic assessment* procedures involve manipulation of antecedent events to provide the SLP with information regarding the child's readiness to learn. Administration of dynamic assessment procedures provides the SLP with the necessary information to decide who should receive intervention by providing information regarding a child's potential for immediate change. Whereas, profiling and dynamic assessment procedures provide the critical data for making informed decisions regarding when to intervene, they require some method to assess the validity of these decisions. *Tracking or monitoring* is the procedure suggested for this purpose. It provides a system which monitors change over time without intervention and allows the SLP to monitor those children who may be slow but who are in the process of catching-up without intervention.

CLINICALLY SIGNIFICANT CHANGE

It is often a difficult task for an SLP to determine if treatment results in a significant change in the child's communication. Bain and Dollaghan (1991) propose a definition and discussion of clinically significant change that contains three dimensions. A clinically significant change is a change in student performance that can be shown: (1) to result from treatment rather than from maturation or other uncontrolled factors, (2) to be real rather than random, and (3) to be important (i.e., size or magnitude; impact on the student) rather than trivial. There are two determiners of the importance of change: (1) size or magnitude and, (2) impact on the student. Documenting a clinically significant effect of treatment involves meeting each of the three criteria.

This documentation of clinical significance is useful in prospective, on-line, and retrospective decision-making. Prospective treatment planning enables the practitioner to estimate the amount of change expected to occur over a specified time. This prospective planning prepares the practitioner to evaluate the student's progress in-progress and to make decisions regarding treatment effectiveness, and to make adjustments as necessary. This enables a systematic evaluation of student progress, and avoids the all-too-frequent practice of using *guess-work* as a means for discovering that the student is not making sufficient progress.

Retrospectively, the practitioner is able to determine the clinical significance of treatment to document accountability for justification of service delivery practices. Documentation of accountability in the schools is important to assist in developing reasonable cost/benefit ratios for program planning purposes. Effective utilization of this documentation can be a highly persuasive tool.

HOW LONG SHOULD THERAPY CONTINUE?

Although more research is needed in the schools, our profession has engaged in addressing the questions of when to initiate intervention, and of the effectiveness of our treatment procedures and service delivery models. However, an important question remains largely unaddressed, and that is, when should the student be exited? Campbell and Bain (1991), in their discussion of this question, support the notion that merely discharging a student based on predetermined exit criteria or on a lack of progress over time can result in never exiting the student; or in withholding treatment during a critical learning period. They address the issue of student exit by incorporating a multiple treatment outcome approach into existing procedures for dismissal. Questions regarding whether student dismissal should occur following completion of a specific goal; and whether to advance the student to the next stage of intervention; or to exit the student altogether can only be answered by drawing clear distinctions between various treatment outcomes. Distinctions are introduced between intermediate, instrumental, and ultimate treatment outcomes and provide some methodological techniques for evaluating a child's progress toward these specific treatment outcomes.

Not only must the practitioner decide when to terminate treatment on a specific goal, but also a decision must be made as to when to discharge a child from an intervention program. A framework is recommended which distinguishes among the three distinct treatment outcomes to facilitate this decision-making process. The intermediate and ultimate outcomes are also referred to as short-term and long-term treatment objectives. A promising method for increasing the efficiency of service delivery, however, is the instrumental outcome because of its emphasis on determining the points at which children will continue to progress without further treatment.

These discussions of when intervention should be recommended, clinically significant change, and how long therapy should be continued are merely starting points in our determination to refine our ability to document the effectiveness of the services we provide in the schools.

INITIATING A RESEARCH PROJECT IN THE SCHOOLS

The school restructuring movement and discussions of new service delivery models raises many questions, including: what have we done to examine our effectiveness in the classroom; should we serve our students in a full inclusion model or with pull-out services; and, how do we work on goals and objectives in the general classroom with 27 students? As answers are provided to these and other questions, research is needed to substantiate the efficacy of proposed treatment models.

The dilemma facing most school-based practitioners is the lack of money, staff, resources,

and time, which makes it seem almost impossible to conduct research. There are, however, creative ways to facilitate the implementation of a research project in an educational setting. Consider the following possibilities:

1. Contact your *local university* - departments of communication disorders, special education, or regular education. Locate a university professor willing to offer you guidance with your research.
2. If you do not have a university in your area, contact a *university in another city or in another state*. You would be surprised at the number of university professors interested in collaborating on a project with school districts in other cities or states.
3. Contact your *state department of education*. Inquire about available grant funds, and any technical assistance or general guidance they may be able to provide.
4. Most school districts are experiencing tight budgets, so consider pooling your resources and monies. Collaboration between *neighboring school districts* is an effective way to initiate a research project and pool money and resources.
5. Establish a partnership with a *local business or service organization* (e.g., Lions, Elks). Request funding support to help offset expenses with assessment tools, special training, or, substitutes to provide you with periodic release time to conduct the research. (Remember to seek prior administrative approval for your project.)
6. *State professional associations* can be of assistance. Inquire about available grants through professional associations or about the names of individuals conducting research in your state. Contact these professionals conducting research to find out how they set-up their project, to collaborate on future research, and to ask for suggestions or guidance on getting started with your own project.
7. Refer to recent professional journals and other publications to identify *professionals with published research* in your area of focus. Contact several of these professionals to request assistance, or to discuss possible collaboration on a joint research project. You may be surprised to find positive results! Be persistent in your search for support and do not be discouraged by a few initial rejections.

CONCLUSIONS

How can we be assured of bringing high-quality education to students in the 21st century? Societal trends and the national reform movements in education and health care are creating changes in how services are provided to students in the schools. Current service delivery practices need to be examined to determine if they result in clinically significant change. We may *believe* that specific new treatment models are effective, but there are insufficient data from the schools to support our claims. As school-based audiologists and speech/language pathologists, we must participate in conducting and reporting research to effectively restructure our educational system.

It is only with school-based documentation and accountability that we will be able to ensure provision of appropriate services to our school children.

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A New Clinical Data Base for Medical Speech-Language Pathology

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INTRODUCTION

The demand for information about the effect, cost, and quality of clinical services in speech-language pathology has never been greater. After many years of discussing the methodological problems of precise and meaningful evaluation of program efficacy and outcome, it is necessary for clinicians in medical settings to step up to the challenge of systematic measurement of clinical variables in relationship to both functional communication abilities and cost.

This article describes two areas that may be of interest to program directors and clinicians in medical speech-language pathology programs: (1) the key issues and challenges involved in data organization and management in our field; and (2) the process that has been used to develop and introduce a new clinical data base for speech-language pathology at the Henry Ford Hospital. The data base is currently housed on a local network within the Division of Speech-Language Sciences and Disorders. The purpose of this article is to summarize the key features of the organization of the data base. Interested readers are encouraged to contact the author if there are specific questions or comments about the equipment or configuration of this system.

KEY ISSUES AND CHALLENGES

Several issues combine to challenge the individual interested in utilizing an organized data management system for program assessment and improvement in our field. They include cost of program development and production, lack of an underlying conceptual organization for information management (especially clinical information) within our discipline, and lack of tools for quantifying clinical information in ways that are compatible with computer input, storage, and retrieval. A final issue, perhaps the universal one, is related to the amount of time required for data management.

Cost/complexity of program development

There are numerous variables that must be considered when one wishes to measure the cost, benefit, quality, outcomes, efficacy, or efficiency of a specific program. Because the state-of-the-art in our discipline is such that there are no definite, proven, and reliable approaches in common use, the task of building an organized relational data base can become both cumbersome and complex. Questions that an administrator, clinician,

or third party payer might wish to ask include:

- How much did the patient improve?
- What was the functional benefit to the patient?
- What resources were used to help this patient?
- How much time was spent?
- What was the cost of the service?
- How many visits did the patient have?
- How well did the clinician predict the patient's eventual outcome?

Obviously, this list could go on and on. Perhaps an interested party would want to ask the questions outlined above using data from a defined group of patients (e.g., patients with aphasia, children under two years of age, patients seen in a specific time period). Further, it may be that the *combination* of a set of variables is necessary to address an important question. Examples of questions combining variables include:

Does clinician A have better clinical outcomes with patients exhibiting severe dysarthria than does clinician B? or

What is the average amount of time (in visits, hours, weeks, months) that it takes patients with X disorder to make functional gains in communication?

The complexities of our clinical work cannot be underestimated. Thus, when developing a model for information management it becomes difficult to estimate the cost, time, and effort needed to develop a usable and effective information system. In general, the cost will be affected by the hardware and software utilized, the need for outside expertise in programming or conceptual development of a data base which meets the unique needs of the clinical program, the complexity of the clinical and/or administrative questions under consideration.

Lack of an organized conceptual approach to information management within our discipline

There are no readily available guidelines or resources for approaching the complex issues of data base design that are specific to communication sciences and disorders. Thus, the person interested in developing such a system must utilize resources developed outside the field to address issues of clinical concern. In addition to the lack of standard commercial data bases specifically designed for use in clinical speech-language pathology programs, there is disagreement among professionals within the field on the content and methods for measurement of clinical benefit. There appears to be a trend toward measuring "functional outcomes" as the most desirable

constructs for measurement, but a uniform set of functional measures is not yet available within our field.

Difficulty in capturing meaningful clinical information

Another area of concern relates to transfer of large amounts of clinical information to computer systems. In order for the computer to process information, it must be uniformly presented to the system. This uniformity reduces the possibilities for capturing large amounts of anecdotal information, which is the type of information that is usually presented in speech-language pathology reports. For information to be transferred to a data base, it has to be coded by the original author of the clinical report or by another individual trained to code information presented by the original author or examiner. Thus, standardized methods of organizing descriptive information have to be agreed upon and followed by users of the system. In addition, a shared clinical data base requires that users agree on a large number of rules or "conventions" for various aspects of data management.

Time constraints

Increasingly, the demands placed on the clinical provider in an institutional setting are significant. Demands for increased clinical productivity or efficiency, participation in research or educational programs, committee membership in the department or institution, and increased participation in "team" meetings all reduce the amount of discretionary time allowed for staff members to engage in activities related to documentation of clinical services. Thus, a final challenge for the individual interested in developing a clinical data base is to recognize that development and application of the new information system will take valuable time and that the methodologies chosen for recording information, data entry, and generation of reports should be as efficient as possible. In today's demanding clinical environment it is unreasonable to expect active clinicians to add hours to their day for purposes of developing or using a data information system.

In summary, each of the issues cited above is a challenge to the professional interested in developing a clinical data base. The remainder of this article will report on the way in which the clinical staff of the Division of Speech-Language Sciences and Disorders at Henry Ford Hospital (HFH) has addressed each of these challenges in developing a clinical data base.

C H A R A C T E R I S T I C S O F T H E H F H C L I N I C A L D A T A B A S E

Before providing specific details about the organization of the HFH data base, a basic overview is provided. The purposes of the Speech-Language Pathology data base, agreed upon by all staff members, are as follows:

1. To allow for rapid retrieval of clinical information on individual patients and also groups of patients.
2. To allow for easy entry, storage and sorting of clinical information.
3. To monitor clinical activities for administrative purposes.
4. To measure clinical effectiveness and outcomes.
5. To select patients for possible inclusion in clinical and/or research programs.

The program is maintained on a Novell network. Each clinician has a PC/workstation in his or her office which allows for retrieval of patient information. Data are entered as follows. Each clinician completes a standardized form after each patient visit. The form is read by an electronic scanner that automatically enters the data into the data base, thus reducing the time for data entry. These forms generate the patient's bill, send data relevant to billing to the hospital accounting department, and also provide the information for the division's clinical data base.

D A T A B A S E O R G A N I Z A T I O N A N D C O N T E N T

The data base is organized into three major sections. Section I contains patient demographic information and the specific information needed by the patient accounting department for billing purposes. This data form is completed at the time of every clinical visit or service. Section II contains the specific clinical information that has been developed for use in our clinical program. This body of information relates specifically to the patient's clinical speech-language diagnosis and treatment information.

While the form that is used allows for tracking of a significant amount of information, certain conventions are followed so that all of the information is not tracked at each visit. Table 1 summarizes the categories of information that are tracked for each patient and indicates the points in time when that information is generated for each patient. Note the presence of information required by most clinical programs as well as most insurers and external accrediting bodies.

The content areas for the clinical data base were selected after extensive discussion and consideration by program staff. Thus, content was defined by staff consensus. In addition to the definitions, a rationale for inclusion of the category was presented and agreed upon by the staff. Table 2 presents the definition, rationale, and categories for the "Level of Complexity Category."

R E P O R T S A N D O U T P U T

The benefits of a clinical data base such as the one described are found in the quality of the output from the system. There are two general types of reports that are available from our clinical data base. "Standard" reports are the first type of report. These are reports which have been programmed into the data base and are generated directly off a menu on the computer screen. Standard reports that are available to any user of the data base are:

- Daily list of patients seen
- Monthly progress summary
- Discharge summary
- List of ongoing services by patient
- Weekly clinical productivity summary by clinician
- Monthly summary of patients seen by diagnosis, location (in-patient and out-patient), and age category
- Daily in-patient list (name, room no., diagnosis, referring service)

For purposes of program evaluation, research, and quality improvement, the applications of the data base are virtually limitless. These areas are addressed with "non-standard" reports. The process is slightly more complex for accessing the data base information, but any user of the system can select a group of patients on any of the variables by which patients are

categorized in our system.

Examples of some of the topics that can be explored with "non-standard" reports include:

- Amount of time spent in evaluating a specific patient group
- Cost (in time or dollars) of achieving a specific outcome for a patient or group of patients by diagnosis
- Progress in functional communication for a specific subset of patients within a given time period
- Relationship of clinician's estimate of prognosis established at evaluation with patient status at discharge

S U M M A R Y

This paper has presented some of the key issues in the development of a clinical data base for speech-language pathology in the medical setting. In the Division of Speech-Language Sciences & Disorders at Henry Ford Hospital, we are continuing to develop and expand the data base because we are finding new applications on a regular basis. Individuals wishing to learn more about this data base should contact:

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TABLE 1: Categories of Information Utilized in the Clinical Data Base and Key Times for Entering The Data

Category	Evaluation	Monthly (for patients in therapy)	Discharge	Whenever A New Service Is Completed
Level of Complexity	X	X		
Hearing Screen Results	X			
Special Procedures Completed	X			X
Communication Disorder(s) Present	X		X	
Severity Levels for Each Disorder	X		X	
Functional Communication Measures	X	X	X	
Prognosis	X		X	
Projected Length, Duration and Frequency of Treatment	X			
Follow-up Needed	X	X	X	X
Discharge Reasons			X	

TABLE 2: Definition, Rationale, and Categorical Choices: "Level of Complexity Category" of the Speech-Language Clinical Data Base

CATEGORY: LEVEL OF COMPLEXITY

Definition: Refers to the degree of effort, clinical expertise, or extra resources (e.g., time) that could be used to manage the patient's communication/swallowing disorder.

Rationale: In addition to the diverse clinical populations seen by our division, cases vary by complexity. Because we are interested in understanding how resources are utilized and sources of variability in our approaches to care and also variability in outcomes, we categorize the complexity of cases seen at the time of initial evaluation and then periodically re-categorize the complexity.

Categories:

Simple Case: case can be managed in a routine manner by an experienced clinician.

Complex Case: case will require extraordinary time/effort.

Very Complex Case: extensive time, effort, or skill will be needed to manage the case. (Examples: requires clinical expert; or extensive collaboration with other disciplines; or frequent visits to school, home, nursing home, etc.)

"From Where I Sit"

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This issue of *Tejas* is focusing on the efficacy of hearing and speech-language testing and treatment. As a former academic neonatologist, with special research and clinical interest in high-risk newborn follow-up, I am particularly gratified to see the professionals in audiology and speech-language pathology ask the hard questions about efficacy and cost-effectiveness of their special areas of expertise.

I will never forget the Rh-sensitized infants who were treated with in utero transfusions and multiple exchange transfusions after birth. Their problems of anemia, hyaline membrane disease, congestive heart failure, hyperbilirubinemia and complications of treatment taught volumes to their caretakers in the Neonatal Intensive Care Unit (NICU). But beyond those critical days, the long-term follow-up needs of these survivors were often unique. By the time these infants were ready for discharge from the NICU, they often looked like "normal preemies." They did not have birth defects or any unusual, visible scars of their hospitalizations. However, the most common, serious sequelae found in follow-up were profound hearing loss and, its collaborative problem, difficulty with normal speech and language development.

Of course, other NICU graduates were also at-risk for these follow-up problems. The classical risk factors of congenital anomalies of the

central nervous system or low birth weight, congenital infections, acquired sepsis, hypoxia, and hyperbilirubinemia all required hearing assessment and speech-language evaluations during follow-up. Surprisingly, when I actually worked out the details with the volunteer group, Telephone Pioneers of America, to assess every newborn who was discharged from our nurseries, the largest number who actually proved to have significant hearing loss were full term infants who had a positive family history of congenital/hereditary hearing loss.

During the 20 years that I practiced neonatology, the incidence of hearing loss in newborns decreased markedly as the medical profession prevented Rh-sensitization, identified newborn infections more quickly, improved the safety of antibiotic treatment, and developed non-invasive techniques for continuous oxygen monitoring. Even the criteria for recommending newborn audiological evaluations were refined. Testing entered the "high-tech" era and Brainstem Evoked Response Audiometry replaced the bell-or-voice evoked behavioral response methods.

With specialization in all fields growing rapidly, the whole area of hearing and speech-language became highly professional and primary caretakers often backed away from the simple screening techniques like asking for family or birth history. In the clinic, practitioners stopped

evaluating the 3-6 month old (gestationally corrected age) infant for response to sounds, or spontaneous speech, and stopped eliciting the history from the parents about behavioral changes to voice and noise stimuli.

As this issue of *Tejas* looks at the status of the highly specialized tests and treatments for hearing loss, speech delay, and language abnormalities, I would challenge all of you in these professions in two areas: (1) to re-think how you can utilize the primary caregivers to better screen patients for you by the simple techniques of taking a history and performing an age appropriate office exam (remember, all of your physician and nursing colleagues see hundreds of patients in their offices, clinics, day care and school settings compared to the number of referrals they make); and (2) to look at the current array of testing and treatment modalities in terms of outcomes at the patient/family level. For example, have control trials been performed, or have the time and resource costs to families been out-weighted by the children's functional improvements amongst peers or in school?

In this era of Health Care Reform, can audiologists and speech-language pathologists lead the way in improving their professional activities based on measurable outcomes and practical, patient-centered achievements?

"Comments" Fetal Alcohol Syndrome

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Sanchez's recent article (*Tejas*, 20 [Spring/Summer, pp. 22-24]) focused on speech-language and hearing in children with the Fetal Alcohol Syndrome (FAS). Prenatal exposure to alcohol is a potential risk factor for subsequent speech-language and hearing problems. However, variations in the Fetal Alcohol Syndrome and its frequent association with caregiver dysfunction create problems regarding the nature and severity of its sequelae. Children with FAS may have normal speech-language and hearing while others have mild to severe speech-language or hearing problems.

Readers interested in FAS may also wish to review the following literature:

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Stressing the Need for Inclusion of Cultural and Linguistic Diversity Within Our Professional Preparation: A Case Study

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INTRODUCTION

During the last two decades, an increased awareness of multicultural and multilingual issues has developed in our field. Position papers have been written establishing guidelines for working with social dialects and linguistically diverse populations (ASHA, 1983, 1985; Cole, 1989). Academic programs that focus on linguistically and culturally diverse groups have been developed in many universities (ASHA, 1985). Unfortunately, there is still a large gap between the number of professionals with the necessary background for working with multicultural and multilingual populations and the number of individuals who need services (ASHA, 1985; Cole, 1989). This need is readily apparent in the school setting.

United States census projections indicate that by the year 2000, one third of the school-aged population will be of culturally and/or linguistically diverse groups (Nuru, Melcher & Naremore, 1992). In Texas, for example, the number of Hispanic students enrolled has been rising steadily, while the enrollment of Anglo students has been declining (Ortiz & Yates, 1983). Other states with a high number of culturally and linguistically diverse populations, such as California, are also projecting an increase in the number of non-Anglo children (Langdon, 1992). These data emphasize the need of having professionals well prepared to serve diverse populations within the school system.

Adequately trained speech-language pathologists will reduce unnecessary referrals and inadequate school placement decisions for children from linguistically and culturally diverse groups (Ortiz & Maldonado-Colón, 1986; Ortiz & Yates, 1983). The question that arises within our profession is what constitutes adequately trained. Obviously, knowledge about all communication disorders (i.e., articulation, language, voice, fluency) is essential. An adequately trained clinician must demonstrate competence in the assessment and treatment of individuals presenting a variety of communication disorders. For culturally and linguistically diverse groups, additional knowledge in the areas of sociolinguistics, bilingualism, and alternative methods for assessment and intervention is necessary (Adler, 1990; Caterino, 1990; Kayser, 1993; Ortiz & Maldonado-Colón, 1986; Peña, Quinn & Iglesias, 1992).

As is known by most professionals, our field has very few individuals who are proficient in a language other than English (ASHA, 1985). Al-

though it is difficult to quickly remedy the lack of professionals who have near native proficiency in a language other than English, our profession is beginning to grapple with issues pertaining to academic preparation for working with multicultural and multilingual populations. New professional and educational standards have established that multicultural and multilingual issues are to be incorporated into our clinical preparation and academic programs. Furthermore, individuals who are presently working in the field are encouraged to enroll in continuing education classes and workshops that focus on diversity (Anderson, 1994). Individuals who are presently working with diverse populations need to become informed about multiculturalism and multilingualism in clinical practice. If professionals do not accept the responsibility to gain this knowledge base, the effects on the lives of the individuals they serve can be disastrous.

The purpose of this article is to demonstrate, through a case study, how lack of knowledge of multicultural and multilingual issues can have a deleterious effect on the persons we serve. The case study to be presented is of an eleven year old Hispanic girl who was referred to a university clinic in Texas for a speech and language evaluation. She was first evaluated in her school, after completing kindergarten, and has since been placed in special education programs. I will use the name Milagros to refer to her. The first part of the presentation will consist of a case history obtained through a parent interview at our clinic and the results of our assessment. Following, I will present a chronology of her diagnostic and academic experiences, as evidenced in the reports obtained from the various school she has attended. I will conclude my presentation with a critical discussion of the assessment procedures used and their interpretation.

CASE HISTORY INFORMATION

Milagros was referred to our clinic by a friend of the family. The main concern presented in the referral was fluency. According to the family friend, Milagros' mother was very concerned about her daughter's speech, but due to her limited English proficiency, she had not contacted the clinic.

A bilingual graduate clinician obtained the necessary background information. The interview with Milagros' mother was conducted in Spanish. Data concerning language use and language

change within the family, as well as information about development and education, were obtained. Information pertaining to parental concerns about the child's fluency was also gathered.

The information provided by Milagros' mother indicated normal pregnancy and delivery. Motor development milestones were age appropriate. Milagros' first words were produced at approximately one year of age, with two- and three-word combinations emerging at two. Concerns about her speech surfaced at three years of age, when her mother noticed that Milagros was very disfluent. She associated the development of the disfluencies to a traumatic experience. At that time, no other concerns pertaining to Milagros' communicative abilities were expressed by her mother.

Questions were asked about Milagros' proficiency in Spanish and in English. From the information provided by her mother, it was concluded that upon entering school, she was Spanish proficient with limited English skills. At the time of our evaluation, she was English dominant. Her oral Spanish skills were weak and she preferred to communicate in English at home and at school. Her mother was limited English proficient, while her father spoke both languages. Milagros had a thirteen year old brother who was English dominant. Both Spanish and English were spoken at home.

Milagros began her school experience when she entered kindergarten. Prior to this time, she had been cared for by her mother and had not been enrolled in any preschool or day care program. According to her mother, she was tested during her second semester in kindergarten and was subsequently labeled as mentally retarded and placed in special education classes. Milagros has since changed schools twice, and has remained in special education classrooms. Further information concerning her academic experience was not obtained, as her mother was unable to provide more details. From the interview, it was gathered that the main concern was fluency. Milagros' mother explained that this problem had worsened. She further expressed that she did not believe the school was addressing her daughter's fluency problem.

SPEECH AND LANGUAGE EVALUATION

Milagros' speech and language evaluation focused on fluency and language. Although Milagros' mother did not express great concern

for her language skills, this area was thoroughly assessed. She had been placed in special education classes and had been identified as mentally retarded by school personnel. It was imperative, then, to evaluate both her language and fluency. Two bilingual graduate clinicians, under the supervision of a bilingual certified speech-language pathologist, conducted the speech and language assessment. As her mother explained that Milagros spoke Spanish and English, both languages were assessed during the evaluation. In assessing language skills, formal and informal evaluation procedures were used. Milagros proved to be a very verbal and cooperative child. She enjoyed interacting with the clinicians and worked hard in all activities.

Results from Standardized Testing

Two standardized tests were administered. The *Woodcock-Muñoz Language Survey* (Woodcock & Muñoz, 1993) was given to evaluate Spanish language skills. The *Clinical Evaluation of Language Fundamentals-Revised (CELF-R)* (Semel, Wiig & Secord, 1987) was used to assess her linguistic abilities in English.

During the administration of the *Woodcock-Muñoz Language Survey*, it was noted that Milagros had limited verbal output in Spanish. Her expressive Spanish language skills were poor. As a result, administration of the test was discontinued. Since the *Woodcock-Muñoz Language Survey* measured academic language abilities, the results of this test were not surprising, as Milagros had not received academic instruction in Spanish. The results also supported her mother's statement that English was her dominant language.

The *CELF-R* revealed that Milagros was performing below age expectations. She obtained an age equivalent score of 8;6, with standard scores of 4 and 5 in all subtests. Weaknesses were especially noted in the following areas: word classes, semantic relationships, and formulated sentences. Both receptive and expressive language skills in English appeared to be delayed.

Informal evaluation procedures were conducted solely in English. These provided results that contrasted markedly with what was reported in the formal testing. The procedures used included informal conversations with both graduate clinicians, barrier games, narratives, and oral reading and reading comprehension.

Conversation

Milagros demonstrated excellent conversational skills. Her ability to establish and maintain topic was readily apparent. She excelled in referential communication skills. Milagros was able to take the listener's perspective and provide the necessary information. Referential communication devices such as topicalization (e.g., "The woman, she is buying some stuff"), anaphoric reference (e.g., "I went to see some doctors. I could not even trust them."), word substitution (e.g., "Next time, a hard one." (test)), and ellipsis (e.g., Clinician, "Do you read in Spanish, English or both?, Milagros, "Both.") were used consistently

and adequately by Milagros. Breakdowns in communication resulted from severe disfluent episodes. When these occurred, Milagros tended to finish her phrases by saying "and everything," thus failing to provide all the needed information to maintain the conversational exchange.

During these conversational exchanges, Milagros demonstrated age-appropriate syntactic and morphologic skills in English. She produced complex embedded sentences and did not evidence significant morphologic errors. Examples of complex sentences were: "I know how to read that," "I don't like to talk when people tell me hi," and "That's why I don't like to talk too much." With the exception of not completing sentences during severe disfluencies, no deficits in sentence formulation were noted.

Barrier Game Activities

Two barrier games were used to assess more thoroughly Milagros' language skills, especially in the areas of referential communication skills and grammatical knowledge. Two sets of two identical game boards were used, the child and the clinician each having one board. A series of objects were to be pasted to the boards. During the first activity, the clinician gave Milagros instructions as to where the objects were to be placed. Only verbal instructions were given. The second activity had Milagros giving the clinician the placement instructions. In this way, both receptive and expressive language abilities were assessed. In both tasks, Milagros performed adequately. She demonstrated good comprehension of prepositions, locative terms and complex grammatical structures. She was very effective in providing the necessary information to the clinician, so that both game boards would be identical. Her referential communication skills, as assessed in this procedure, were excellent.

Narratives

Milagros' narrative skills were assessed following two procedures. The first procedure involved a story-telling task. Three different pictures depicting a scene were provided. Milagros was asked to tell the clinician a story about each picture. The second procedure involved Milagros expressing a personal narrative, where she chose the topic and the event for narration. Although Milagros was able to produce three narratives based on the pictures provided by the clinician, these were short and simple in structure. Nevertheless, the narrative structure used was appropriate. An initial statement was provided (i.e., "Once upon a time"), as well as a final statement (e.g., "the end"). The correct ordering of events within each narrative was also followed. Milagros' personal narratives, on the other hand, were more extensive and detailed. The difference in performance across narrative types could have resulted from different levels of experience with each narrative type, as well as with the materials used for eliciting a story. These two factors have been described in the literature as important determinants of narrative skill (Gutierrez-Clellen & Quinn, 1993). A salient feature of all of Milagros'

narratives was the detailing of personal states and emotions of the characters. This is a late developing skill (Gutierrez-Clellen & Hofstetter, 1994). Furthermore, she was able to incorporate cause and effect relationships in her narratives. An example of a story-telling narrative that evidenced these skills follows:

"Once upon a time, there was one wife and one husband. They were happy. All of a sudden he dropped that right there (points; clinician: 'What is that?'). He dropped the cup and plates. So she screamed."

Oral reading and reading comprehension

Reading was used to assess fluency. Nevertheless, this task provided information concerning Milagros' language abilities. Although she was able to read, her oral reading was slow. She tended to read syllable by syllable and used her finger to guide her reading. Even though she was not expected to answer questions about the story's content, Milagros asked the clinician for questions. She was given five questions and answered each correctly. This response pattern suggested good reading comprehension skills with poor oral reading skills. As mentioned previously, her severe disfluencies may have affected her oral language skills, including reading.

Fluency

Fluency was assessed throughout the two evaluation sessions with Milagros. Samples of conversational exchanges, oral reading and picture description were videotaped and analyzed. During all clinical activities, Milagros demonstrated severe disfluencies accompanied by secondary behaviors. Characteristic disfluencies included syllable, word and phrase repetitions, inaudible prolongations, interjections, rephrasing and pauses lasting an average of three seconds. Milagros' breathing pattern during speech was characterized by sudden audible inhalations occurring within words and phrases. This was a consistent pattern that affected the rhythm of her vocal output. In general, when these audible inhalations occurred, she increased her rate of speech and often failed to complete the target phrase or sentence.

Secondary behaviors were also evident. The most salient were head and upper body movements, and facial grimaces such as eyebrow raising, eye blinking and eye widening. Another secondary behavior noted, especially during picture description, was rapid hand and finger movements. During many disfluent episodes, Milagros also demonstrated tension in the neck region and clavicular breathing. This was more noticeable during within-word inhalations.

The disfluencies present in Milagros' speech negatively affected her oral language skills. There were many instances where Milagros, due to a disfluent episode, failed to produce the correct word or phrase. As compensatory strategies, she would use the phrase "and everything" to complete the sentence and use general terms such as "that," "this" and "there" for more specific words.

This strategy was noted only during disfluent episodes. In addition to these strategies, Milagros would at times slow her speech rate and divide the words into syllables. This tactic seemed to occur during severe disfluent periods and aided her in completing the target sentence or phrase.

As expected, Milagros was keenly aware of her disfluencies. She expressed that she did not like to talk in school because she was ridiculed by her peers. She mentioned that she enjoyed talking with her teacher, as she did not respond negatively to her stuttering. Milagros added that she desired to speak better and indicated an interest in receiving therapy.

Conclusions

All the data obtained during the evaluation process indicated that Milagros was a severe stutterer. Her language skills, specifically those related to academic performance, were poor. Her expressive and receptive language skills in informal tasks, on the other hand, were age-appropriate. Milagros' disfluencies negatively affected her oral language skills, especially since she used compensatory strategies that may be confused with possible expressive language deficits. It was concluded that the expressive deficits observed were due to the disfluencies and not language deficits, as these were observed primarily during disfluent episodes. The reasons for her depressed language performance in standardized testing instruments may be due to the fact that these test primarily academic language skills. Her performance on the *CELF-R* suggested performance at the second grade level. Interestingly, the information provided by the family friend that referred Milagros to our clinic indicated that she was receiving academic instruction that corresponded to second grade level.

SCHOOL ASSESSMENT AND PLACEMENT HISTORY

Milagros' first school experience was in kindergarten. As explained by her mother, she was Spanish dominant at the time. Her school placement was an English as a Second Language (ESL) kindergarten program. At the end of the academic year, she was tested by her kindergarten teacher. The *Stanford Early School Achievement Test* (Madden, Gardner & Collins, 1984) was administered. According to the test results, Milagros performed at the pre-kindergarten level. School reports that were obtained failed to indicate the language used during the assessment or if there were concerns regarding fluency. Although she performed at a low achievement level, she was promoted to first grade.

During her first semester in first grade, Milagros' ESL teacher referred her to special services. The teacher's primary concerns were that Milagros could not speak in complete sentences and appeared to have difficulty following conversations. Three months later, she was evaluated by a speech-language pathologist and an educational diagnostician.

The speech and language evaluation was initially conducted in Spanish by a bilingual clinician. According to the school reports, the *Test en Imágenes Verbales Peabody- Adaptación Hispanoamericana* (PPVT-Spanish) (Dunn, Padilla, Lugo & Dunn, 1986) was administered. As Milagros failed this test, the bilingual clinician suggested that she may be English dominant and that she should be tested in English. According to the school report, Milagros' father confirmed that she was English dominant. A monolingual speech-language pathologist then evaluated the child.

The following tests were administered: *The Peabody Picture Vocabulary Test-revised* (PPVT-R) (Dunn & Dunn, 1981), the *Expressive One-Word Picture Vocabulary Test* (EOWPVT) (Gardner, 1979), and the *Test of Language Development* (TOLD) (Newcomer & Hammill, 1982). Results from all standardized test instruments suggested poor language skills. As a result, she was diagnosed as having a moderate to severe language deficit. Fluency was also assessed and she was diagnosed as evidencing a severe fluency disorder.

The educational diagnostician evaluated Milagros using the following assessment procedures: the *Woodcock-Johnson Psychoeducational Battery* (Woodcock & Johnson, 1981), the *Slosson Intelligence Scale* (verbal subtests) (Slosson, 1990), and the *Kaufman Assessment Battery for Children* (nonverbal subtests) (Kaufman & Kaufman, 1983). Adaptive behavior was measured by the *Vineland Adaptive Behavior Scale-Classroom Edition* (Sparrow, Balla & Cicchetti, 1984). This instrument was completed by Milagros' classroom teacher. All achievement and intelligence tests were administered in English. Results from all instruments, according to the diagnostician, placed Milagros within the educable mentally retarded range. No information concerning parent interview or other observations were reported in the diagnostic report.

The diagnostic team that conducted the initial evaluations recommended that Milagros be placed in special education. Although it was stated that Milagros was English dominant, the team members recommended that she continue to receive ESL instruction and suggested she participate in a summer ESL program. Speech and language therapy was also recommended. Milagros was thus placed in a resource room and continued to receive ESL instruction. Speech and language therapy was also provided. Specific goals in this area focused primarily on language skills, such as vocabulary and concept development.

The following year, Milagros enrolled in a different school within the same school district. During the second semester of the school year, the *Iowa Test of Basic Skills* (Hieronimus & Hoover, 1986) was administered. Results from the test indicated both strong and weak performances on various areas tested. On most areas, she performed below the national and class averages. In the areas of listening and morphosyntactic skills, she performed above her classroom mean and near the national average. The composite score placed

her at the kindergarten level (K8). Based on these results, the school placement team recommended that she continue in special education and ESL instruction.

Milagros' family moved the following year, thus changing school districts. The Assessment, Retention, Dismissal (ARD) committee from the new school district studied the reports received from the district where Milagros had attended school. They accepted the mental retardation diagnosis given to Milagros and recommended homeroom resource and speech-language therapy. According to the reports, she met the eligibility criteria for mentally retarded/speech handicapped. The ARD committee also recommended that the three year re-evaluation take place during the second semester of the school year.

The speech-language evaluation conducted as part of the three year re-evaluation process continued to indicate below average expressive and receptive language skills. This diagnosis was based on Milagros' performance on the *Test of Language Development* (TOLD) (Newcomer & Hamill, 1982), and teacher and clinician observations. Fluency was not addressed in the summary statement provided. The only comment made was that Milagros demonstrated difficulty breathing when speaking.

The second ARD committee meeting discussed Milagros' academic performance and agreed to change the diagnostic label from mentally retarded to learning disabled, as she had demonstrated significant progress during the school year. Homeroom resource classroom was the recommended placement. Continued speech and language therapy was also recommended.

DISCUSSION

As the school reports were studied, it became quite evident that many of the data obtained during our evaluation failed to correspond with what was presented in these reports. For example, fluency was not seen as a possible factor affecting expressive language skills. Our diagnostic results suggested that Milagros' stuttering did, in fact, severely constrain her verbal output. Language deficits were noted in Milagros, but these pertained to academic language skills, as assessed in standardized testing instruments. School reports, on the other hand, maintained that the primary deficits were linguistic. From the case history information, as well as from our interactions with Milagros, she did not impress us as a child with cognitive deficits. In fact, the label of mental retardation was a surprise to us. Her ability to communicate effectively, as well as her ability to complete tasks and to use language appropriately in a variety of situations within the clinic conflicted with this diagnostic label. From studying the school records, it became apparent that many issues pertaining to the assessment of culturally and linguistically diverse children were not taken into consideration. It is plausible that this failure to consider these issues resulted in an incorrect diagnosis and thus incorrect school placement. This

scenario, in turn, curtailed Milagros' academic development. Two main problems with the school assessment process were salient. The first relates to a lack of knowledge of bilingual language development and sociolinguistics. The second relates to the methods used for data collection during the evaluation process.

Milagros began her school experience in kindergarten. According to her mother's report, and to the school placement decision (i.e., ESL kindergarten), she was Spanish dominant. It is important to note that she came to school with no previous school or day care experience. Up until the age of five and a half years, she had been cared at home by her mother. As has been discussed by many researchers, our educational system reinforces what middle-class mainstream children have learned at home (Adler, 1993; Iglesias, 1994). A child who does not belong to the mainstream group and who has not had these experiences will be at a disadvantage. It is quite possible that in Milagros' case, there was a mismatch between the classroom environment and the home environment. Her poor performance on the *Stanford Early School Achievement Test* (Madden, et al., 1984) could have resulted from this mismatch. In addition, Milagros presented a fluency problem. This, in turn, could have affected her school performance, especially in oral language skills. Milagros' fluency problem appeared to be overlooked by the teacher who made the initial referral to the assessment team. She was concerned about Milagros' expressive language skills, but no mention of stuttering behavior was presented in the referral. It is plausible that Milagros' difficulties stemmed from her fluency problems, and not from a language impairment.

Two extremely important issues that were overlooked in the initial school assessment, and that are often not considered when assessing children in bilingual environments, are arrested development and language loss. Arrested development occurs when input in the child's first language is reduced. This results in the child not continuing to develop the native language. When language loss occurs, the child may begin to lose the ability in the first language (McLaughlin, 1984; Schiff-Myers, 1992). As the child is beginning to acquire the second language, skills in this language may not be comparable to those of native speakers of the same age. A child who evidences language loss or arrested development, then, performs in a way very similar to a language learning disabled child. If the child is compared to monolingual speakers of both languages, performance below age levels is to be expected. A diagnostician who is not aware of this phenomenon will most likely misdiagnose the child as being speech and/or language impaired.

From the data provided by the school reports, it is quite possible that Milagros was evidencing language loss. Her poor Spanish skills and English performance, as compared to monolingual children, suggest language loss. Since other essential information was apparently not gathered, the distinction between a child experiencing language loss and a language impaired child could

not have been made with certainty during the initial school assessment.

As indicated by many researchers, in order to be able to differentiate between these two children, a thorough case history needs to be obtained (Anderson, 1994; Kayser, 1989; Langdon, 1992; Schiff-Myers, 1992). In this case history, detailed information concerning language input and changes in this input must be gathered. In addition, parent's concerns need to be addressed. The school reports fail to indicate if a thorough case history was obtained. The only information that appeared to have been provided by the family was that Milagros was English dominant. This is hardly enough data for distinguishing between language loss and language impairment. If Milagros were evidencing language loss, tests that compared her performance to monolingual speakers were inappropriate (Schiff-Myers, 1992). This is exactly what was done during her initial speech and language, and educational assessments.

Not only was there an apparent lack of gathering relevant information, there was an over-reliance on standardized tests for diagnosing a language handicap as well. All research in the field stresses that standardized testing instruments do not adequately measure non-mainstream children's abilities (Anderson, 1994; Brady, Manni & Winnikur, 1983; Kayser, 1989, 1993; Langdon, 1989, 1992; Mattes & Omark, 1984; Miller, 1984; Washington & Craig, 1992; Wolfram, 1983). The initial speech and language evaluation relied essentially on results from three standardized tests. Information from informal observations, language sample analysis and parent interview were minimal or non-existent. As has been noted in the literature, the procedures used in the evaluation process of culturally and linguistically diverse individuals must not be culturally and linguistically biased (Anderson, 1994; Taylor & Payne, 1983). If they are, the child's responses may not be due to lack of language ability, but to lack of experience in performing the task at hand.

An example of how cultural mismatch between testing procedures and child background and experience was provided by Peña, et al. (1992). They studied low income Puerto Rican and African American Head Start children's performance on a labeling task. For these two groups, labeling objects in the environment is not a typical activity, as children are not asked to identify and label objects that are known to the adult interactant. Children from these groups thus performed poorly on the *Expressive One Word Picture Vocabulary Test (EOWPVT)* (Gardner, 1979), as the responses expected from the children were not typical for their cultural background. After providing the children with the experience of labeling, scores in the test improved significantly, most children performing at chronological age expectations. This finding indicates that experience, and not language ability, affected the child's performance.

The evaluation of children from culturally and linguistically diverse groups should rely minimally on results from standardized test procedures

(Anderson, 1994; Brady, et al., 1983; Kayser, 1989, 1993; Mattes & Omark, 1984; Miller, 1988; Washington & Craig, 1992; Wolfram, 1983). Other assessment procedures need to be performed. Ethnographic observations should be an essential part of the assessment, as well as a thorough and in-depth parent interview (Anderson, 1994; Kayser, 1989, 1993). Careful examination of the school records is also recommended (Caterino, 1990). From the data gathered in the school records, ethnographic observations were not part of the assessment process. It is unknown if a parent interview was conducted, and if it was, how it was conducted. The only data available are standardized tests results.

Milagros' parents, according to the initial assessment data, appeared to agree that their daughter had a communication problem. What is not apparent, though, is if what they were concerned about - fluency - was adequately relayed to the assessment team. There are no data in the school records to indicate that this was the case. From the parent interview conducted at our clinic, the mother did not have a clear understanding of the assessment process followed at the school and its results. This was readily apparent when Milagros' mother established the date of initial diagnosis of mental retardation during kindergarten, while the school records indicate that this diagnosis was done during first grade.

The intelligence and achievement testing conducted during the initial evaluation was fraught with the same problems present in the initial speech and language evaluation. When assessing intelligence in children from linguistically and culturally diverse groups, extensive observational periods followed by team meetings and a careful review of the child's school records are necessary (Caterino, 1990). As with language assessment, standardized testing instruments may not provide adequate information concerning a child's cognitive abilities. They must be supplemented with observational data (Caterino, 1990). Milagros was assessed using standardized tests solely. Her performance on the verbal scale (*Slosson Intelligence Test*) could have resulted from language loss. In addition, her stuttering could have affected her responses. Her nonverbal performance was also low. Nevertheless, issues pertaining to cultural bias in the procedures could have also affected the results. Milagros was given the *Kaufman Assessment Battery for Children* (Kaufman & Kaufman, 1983). Although this test has been used with limited English proficient children and non-mainstream children, Hispanics are underrepresented in the standardization sample. As a result, the validity of this test for the Hispanic population has not been established (Barona, Santos de Barona, & Fradd, 1989).

Milagros was diagnosed as language handicapped and mentally retarded based on two individual assessments fraught with methodological problems. It is quite plausible that she was initially misdiagnosed and incorrectly placed in special education. Information obtained from our assessment and parent interview suggest that Milagros was initially misdiagnosed. Lack of

knowledge of sociolinguistics, non-biased assessment, and bilingual development are responsible for this incorrect diagnosis.

These gaps in knowledge resulted in limiting Milagros' academic experience. She has always been placed in resource rooms. According to the information gathered during our evaluation, Milagros' academic experience had not surpassed the second grade level. Interestingly, that was the level at which she performed on standardized testing instruments that were geared towards evaluating academic language skills. It is possible that she performed at this level not because she was unable to perform at a higher level, but because she had not been provided with the opportunity to prove otherwise. A procedure such as the one presented by Peña, et al. (1992) would assist us in establishing this. As this procedure aims at teaching the child the necessary skills for performing tasks, if teaching is effective and Milagros is able to learn how to respond appropriately, it can be hypothesized that the learning experience and not the lack of an innate ability was responsible for her initial poor performance.

Perhaps the most telling information from the school records are the results of Milagros three year re-evaluation. These results bring forth a change in the child's diagnostic label from mentally retarded to learning disabled. The reason provided was that Milagros had improved significantly in one academic year. The question that arises is why is Milagros performing as a learning disabled child. It is quite plausible that her

initial diagnosis of mental retardation resulted in lack of academic opportunities that were at her potential level of performance. The consequence would be that she would be delayed in academic skills, not because of her abilities, but of the lack of appropriate experiences provided. The data obtained from our evaluation and the data reviewed from the school records suggest that this may be true. All school evaluations failed to consider linguistic and cultural influences on performance. Procedures for reducing cultural and linguistic bias were not followed. Thus, an initial misdiagnosis is quite plausible. Our evaluation suggested that Milagros presented a fluency problem, but that there was a mismatch between Milagros' language skills as assessed through formal procedures and informal procedures. She demonstrated age-appropriate skills in the informal measures, while evidencing poor language abilities in the standardized measures, which measure academic language skills.

C ONCLUSIONS

Milagros should represent to us how lack of an adequate knowledge base on issues pertaining to non-biased assessment, bilingualism, and sociolinguistics and how these relate to our field can significantly affect a child's future. Milagros is a child who was, in most probability, misdiagnosed as mentally retarded and language impaired. This misdiagnosis resulted from the evalu-

ators' lack of knowledge to adequately assess children from culturally and linguistically diverse backgrounds. The consequences of the initial misdiagnosis were the curtailing of Milagros' academic opportunities and not providing her the intervention needed for her severe fluency disorder. Before embarking on difficult waters, we, as clinicians, must feel confident of our clinical knowledge. Those who will work with individuals from culturally and linguistically diverse groups must arm themselves with the necessary information for adequately serving this population. If not, the results can be devastating to the individual we aim to serve.

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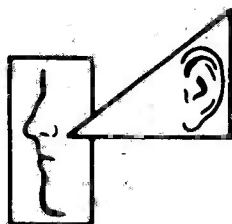
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Perceptions of Siblings of Children with Hearing Impairment

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ABSTRACT

Twelve siblings of children with normal hearing were compared to twelve siblings of children with hearing loss on the Sibling Inventory of Differential Experience (SIDE). Sibling attitudes did not appear significantly different between groups regarding caretaking duties, parental affection or general feelings of dissatisfaction. Implications for further research are discussed.

INTRODUCTION

Many studies have explored the impact of disabled children on their siblings, revealing positive, negative and neutral effects. In some cases, no effect has been observed. Very few studies have concentrated specifically on siblings of children with hearing impairment. The purpose of this research was to investigate how siblings with normal hearing are affected by the presence of a child with hearing impairment in the family.

Research focusing on the differential experiences of individual siblings is supported by family systems theory (Dunn & Plomin, 1990). This perspective views the family system as an organized whole which contains elements that are necessarily interdependent and may be viewed as subsystems within the larger family system, including each individual, as well as the spouse subsystem, parent-child subsystem, and sibling subsystem (Minuchin, 1985).

One of the primary properties of subsystems is reciprocity (Bronfenbrenner, 1977). This property implies that every individual affects and is affected by every other member of the family. Feiring and Lewis (1978) describe the family system as a steady-state process; the system maintains itself while always changing to some degree. Therefore, the stability of a family system is variable. This steady state process combined with reciprocity implies that a change in one individual causes change in other members of the family as well. It seems apparent that the sibling of a child with hearing impairment is likely to be affected by the family in unique ways. Therefore, research concerning siblings of children with disabilities is supported by, and expands the growing empirical base for family systems theory.

Focusing on the perceptions and experiences of disabled children also has practical implications. "All too often professionals identify the handicapped family members as the 'client' or

'patient' when in reality the sibling is most in need of psychological help" (Seligman 1983, p. 531). A number of authors have described the families and specifically the siblings of children with hearing impairment in terms of their experiences, perceptions, and expectations.

Atkins (1987) discusses a number of variables that affect families that include a child with hearing impairment. These are: (1) the degree to which the parents have accepted the hearing loss and how they manage their own feelings. Trevino (1979, p. 492) agrees with Atkins on this point when she states, "... if the parents are unable to accept the disability, the impact of a disabled child will be greater for the siblings, the marital relationship, and the family system as a whole." (2) the degree of disability; (3) the responses of the immediate and extended family members to the hearing loss; (4) the degree of speech intelligibility of the child with hearing impairment; (5) the ability of the family members to communicate with the child with hearing impairment; (6) the availability of appropriate support systems; (7) the quality and quantity of interactions with other children and adults with hearing impairment; and (8) the degree of perceived isolation and/or difference on the part of the individual family members. Luterman (1987) says that the siblings of children with hearing impairment know they are different from their peers and as a result, feel increased loneliness and social isolation.

Trevino (1979) and Murphy (1979) suggest several more variables that make children more vulnerable to being adversely affected by their disabled siblings. When there are only two siblings in the family, the normal child may be at greater risk for developing emotional problems as the result of bearing the impact of guilt, responsibility, and parental disappointments alone. Siblings very close in age to the disabled child may also be more vulnerable. In this case, sibling rivalry may be exaggerated when a disabled sibling is involved. The normal child may also have to deal with peer reactions more frequently. Another variable which may make the normal sibling more vulnerable is when the normal and disabled child are the same sex. Young normal children may fear being disabled like their sibling, especially if there is no other sibling in the family with whom to identify.

Siblings of children with hearing impairment are likely to feel a variety of emotions in relation to themselves, their parents and their siblings. Luterman (1987) has described several possible reactions of brothers and sisters who have nor-

mal hearing. One is anger, which may stem from the frustration of trying to communicate with the sibling with hearing impairment, from having to assume caretaker functions, and/or as the result of the increased attention that the child with hearing impairment receives from the parents. Children may also feel guilty because they can hear while their sibling cannot. Finally, siblings may feel pressured by their parents to be successful as a way of compensating for the inadequacies of the child with hearing impairment. Often, conflicting feelings accompany one another, such as anger and guilt, or jealousy and sadness (Atkins, 1987).

It is clear that the greater the knowledge of how siblings with normal hearing are affected by their brothers and sisters with hearing impairment, the better able professionals will be to help these youngsters. Little research exists that focuses specifically on these dyads. Therefore, the purpose of this research was to expand the existing data regarding the effects of children with hearing impairment on their siblings who have normal hearing. Whether siblings of children with hearing impairment differ from all siblings with normal hearing in three interpersonal areas was explored: sibling, parental, and peer relations. Specific questions addressed included: (1) Do siblings of children with hearing impairment assume more caretaking responsibilities than siblings of children with normal hearing?, (2) Do siblings of children with hearing impairment perceive less parental affection than is perceived in all families where hearing is normal?, and (3) Are the peer groups of siblings of children with hearing impairment more troubled than the peer groups of all siblings with normal hearing? Self-report measures of a group of siblings with normal hearing of children both with and without hearing impairment were compared.

METHODS

SUBJECTS

Two groups, consisting of 12 subjects each, completed the Sibling Inventory of Differential Experience (SIDE) (Daniels & Plomin, 1985). Group 1 consisted of six boys and six girls with normal hearing who each had a brother or sister with hearing impairment. The ages of the subjects ranged from 11 to 20 years with a mean age of 14.8 years. The ages of their siblings with hearing impairment ranged from 8 to 18 with a mean age of 13.7 years. The degree of hearing impairment experienced by the siblings was severe to

profound in both ears. Four of the siblings had been without hearing since birth, while the remainder lost their hearing as the result of injury or illness prior to the age of three. Ten of the siblings wore hearing aids, one had used a cochlear implant for two years prior to the study, and one stopped wearing hearing aids upon entering high school. All but two of the siblings were mainstreamed in school. The siblings all resided with their families. Most of the subjects in this group reported that they communicated verbally with their sibling with hearing impairment. Four of the subjects used sign language with their sibling, and one reported that she often used her mother as an interpreter.

All of the subjects in the first group had two parents, two being step-fathers. English was the language spoken in 11 of the subjects' homes, while Spanish and English were spoken in one subject's home. Most of the subjects' parents were college educated. Three subjects' parents had completed high school.

Group 2 consisted of six boys and six girls with normal hearing whose siblings also had normal hearing. The ages of the subjects ranged from 14 to 18 years with a mean age of 14.8 years. The siblings' ages ranged from 10 to 19 years with a mean age of 14.75 years. All of the subjects in Group 2 had two parents, one being a step-father. English and Spanish were spoken in two of the homes, while only English was spoken in the remaining 10 homes. Like the first group, most of the parents of the second group's subjects were college educated. Two subjects' parents had completed high school, and one subject's parents had completed 11th grade.

TEST INSTRUMENT

The Sibling Inventory of Differential Experience (SIDE), developed by Daniels and Plomin (1985), was used to assess differences between the two groups in the areas of sibling interaction, parental treatment, and peer characteristics. Fifty-nine items on the SIDE yield 11 scales which are as follows:

Sibling Interaction

1. sibling antagonism
2. sibling caretaking
3. sibling jealousy
4. sibling closeness

Parental Treatment

5. maternal affection
6. maternal control
7. paternal affection
8. paternal control

Peer Characteristics

9. peer college orientation
10. peer delinquency
11. peer popularity

The SIDE utilizes a five-point Likert scale that leads to relative scoring of sibling experience. Thus, it provides information concerning the amount and direction of differential experience. For example, the maternal affection scale reveals whether the child tested perceives that more or less love is directed to him or her than to the sibling, and how much more or less love. The pos-

sible responses to SIDE questions in the parental treatment section are (1) this parent has been much more this way toward my sibling than me, (2) this parent has been a bit more this way toward my sibling than me, (3) this parent has been the same toward my sibling and me, (4) this parent has been a bit more this way toward me than my sibling, and (5) this parent has been much more this way toward me than my sibling.

The SIDE includes a fourth section, titled "Events Specific to You or Your Sibling," which was not scored. Space is provided for an explanation of the answers. A sample question from this section is: "Who has been more influenced by an accident or illness?"

PROCEDURE

Subjects were asked to read a set of instructions (included with the SIDE) silently. They were then permitted to ask questions before and during completion of the SIDE. The subjects in Group 1 were instructed to think about their sibling with hearing impairment when answering questions, while the subjects in Group 2 were instructed to think about the sibling closest in age to them. All of the subjects completed the SIDE within 30 minutes.

RESULTS

The statistical technique employed to compare the two groups of data was the multivariate analysis of variance (MANOVA). This technique is appropriate for this analysis because it is used to determine whether one or more groups differ on more than one dependent variable (Borg & Gall, 1989). In this analysis, Group 1 and Group 2 were compared across 11 SIDE scales (see Table 1).

The test of statistical significance used for the overall MANOVA was the Wilks lambda (λ). This

is the most commonly used test for this purpose (Borg & Gall, 1989). The Wilks yields an F value, the ratio of which is used to determine its level of significance. At the $p < .05$ significance level with 11,12 degrees of freedom, the value of F is 2.72 (Young & Veldman, 1981). The Wilks test for these data resulted in an exact F value of .73. The significance of F was .694. Therefore, a significant MANOVA was not obtained. These results mean that the two groups did not appear to differ significantly across the 11 SIDE scales.

DISCUSSION

The results of this study revealed no statistically significant differences between groups in the areas of sibling, parental or peer relations as assessed by the Sibling Inventory of Differential Experience (SIDE) (Daniels & Plomin, 1985). These findings are important because they contribute to the very limited information available regarding siblings of children who are hearing impaired (e. g., Israelite, 1985, 1986; Schwirian, 1976). The specific questions addressed by this study will be examined in relation to the results of this and other research.

It was found that siblings of children with hearing impairment do not assume more caretaking responsibilities than siblings of children who hear normally. While Schwirian's (1976) findings contradict these results, on closer examination she found that caretaking was associated more with the age and sex of the normal sibling than the presence of a child with a hearing impairment in the family. Likewise, Israelite (1986) found no differences on measures of family responsibility. In contrast to these studies, which focused on siblings of children with hearing impairment, several researchers who studied siblings of children with mental retardation found that they did assume more caretaking responsibilities (Grossman, 1972; McHale & Gamble, 1989; Stoneman et al., 1988).

When parental relations were examined, it was found that siblings of children with hearing impairment did not perceive less affection than was perceived in all families where hearing is normal. Israelite (1985) addressed this issue when she interviewed 14 adolescents with normal hearing who had siblings who were hearing impaired. She found that only three of her subjects perceived inequities in parental attention, while four subjects reported that their parental relationships were strengthened by the presence of a challenged child in the family. The results from studies of siblings of children with mental retardation have also been mixed. Some researchers (Graliker, Fishler, & Koch, 1962) have found that parental relations are positively affected, while others (Bagenholm & Gillberg, 1991; McHale & Gamble, 1989) have found them to be negatively affected.

In the area of peer relations, this study found that the peer groups of siblings of children with hearing impairment were not more troubled than the peer groups of children from all families with normal hearing. While Schwirian (1976) did not address this issue specifically, she found that sib-

TABLE 1. Ratings of Siblings With and Without Hearing Loss by Children With Normal Hearing

Variable	Group 1: Subjects with siblings who are hearing impaired (n = 12)		Group 2: Subjects siblings who have normal hearing (n = 12)	
	M	SD	M	SD
1. sibling antagonism	2.93	.62	2.93	.64
2. sibling caretaking	3.40	.65	3.08	.72
3. sibling jealousy	2.64	.69	2.89	.81
4. sibling closeness	2.89	.83	2.92	.67
5. maternal affection	2.72	.67	3.12	.77
6. maternal control	3.48	.66	3.19	.61
7. paternal affection	2.93	.88	2.97	.58
8. paternal control	3.08	.76	3.35	.87
9. peer college orientation	3.24	.71	3.24	.74
10. peer delinquency	3.40	.81	3.07	.56
11. peer popularity	3.21	.52	3.08	.66

lings of children with hearing impairment had lower levels of social activities than siblings of children with normal hearing. However, similar to her findings concerning caretaking responsibilities, this result was more influenced by the age and sex of the child than the presence of a child with a hearing impairment in the family. More conclusive results were found by those who studied siblings of children with mental retardation or autism. Bagenholm and Gillberg (1991) and Stoneman et al. (1991) found that siblings of these children had more peer problems than siblings of children with no retardation or autism.

It is clear from this discussion that research focused on the siblings of children with mental retardation or other disabilities cannot be used reliably to predict how children with normal hearing are affected by their siblings with hearing impairment. The results of this study more strongly support the findings of Schwirian (1976) and Israelite (1985, 1986) who found no significant differences. Perhaps any differences that do exist between children who have siblings with hearing impairment and those who do not are relatively minor and have not been detected by the research instruments used thus far.

Schwirian (1976) suggested that she found no significant differences because hearing impairment is not a visible disability; nor is it viewed as especially socially undesirable as compared to other disabilities. In support of her statement, there was some indication from our study that some of the subjects did not feel that their sibling with hearing impairment had been affected any more than they were by an accident or illness. In the fourth section of the SIDE (Events Specific to You or Your Sibling) which is not scored, one of the questions addresses this issue specifically. Most of the siblings with hearing impairment had, in fact, lost their hearing as the result of injury or illness.

Perhaps Luterman (1987) was correct when he stated:

I think that the effects of the hearing-impaired child on the hearing sibling are both subtle and variable, in large part, depending on the parents' ability to cope with the problem and the speed and sensitivity with which professional help is available to the family (p. 77).

Kashyap (1986) also believes that professional help is very important to the family's adjustment to their child with a hearing impairment. Parents need guidance in both setting up realistic expectations about their child's performance and in resolving conflicted feelings about their child's hearing loss. In his discussion about families that have a disabled member, Trevino (1979) suggests involving the entire family in the diagnostic, and if necessary, the treatment process to facilitate the family's adjustment. Murphy (1979) advocates sibling support groups when there is a disabled member in the family. Support groups give siblings an opportunity to ventilate feelings, gain insight into their family relationships, and learn techniques for handling various situations that are unique to them.

Further research aimed at understanding the experiences of siblings of children with hearing

impairment is certainly warranted. Family systems theory predicts that the sibling with normal hearing should be affected in unique ways. Studies that use larger sample sizes and perhaps more sensitive instruments may uncover differences that must certainly exist. As stated by Borg and Gall (1989): "The level of significance is influenced to a considerable degree by the number of individuals tested in the research project. Thus, the larger the sample size, the smaller the difference needed to reach a given level of significance" (p. 353). Due to the strict criteria used for subject selection, only 12 subjects with siblings who have hearing impairment were available and willing to participate in our study. Similarly, Israelite (1985, 1986) and Schwirian (1976) used small samples. The relatively small number of subjects used in these studies, combined with the broad dimensions of sibling experience tested by the SIDE, may have made it difficult to detect subtle differences.

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The English Use of Adjective-Noun Phrases by Bilingual Spanish-English Speaking Children

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ABSTRACT

Twenty bilingual Spanish/English children (10 kindergarten; 10 first grade) were compared with 20 grade-matched monolingual children on a barrier task which required the use of adjective-noun phrases. Responses were scored for morpho-syntactic errors and for evidence of transference. Results revealed significant delays in the performance of the bilingual kindergarten children but the kinds of errors made by the two groups did not differ significantly. Transference accounted for only a small percentage of the errors.

INTRODUCTION

As the number of bilingual children in the schools increases, differential diagnosis of the language disorders in this population has become a major challenge for speech-language pathologists. Even for the bilingual clinician, the task is a complex one for several reasons. The lack of appropriately normed test materials has been discussed by a number of authors (Damico, 1991; Kayser, 1989). But assuming valid tests were available, one could not conclude that assessment in the child's first language (L1) is sufficient to diagnose the existence of a true language disorder. For example, in young children, who are not yet proficient in L1, the acquisition of each language may not occur at a similar pace. One language may temporarily advance while the other lags behind (Carrow, 1972). Furthermore, if the first language is not maintained in either the school or home environment, proficiency in that language may eventually decrease (Garcia and Gonzales, 1984). A recent article by Schiff-Meyers (1992) discusses this phenomena in depth and encourages bilingual speech-language pathologists to consider language loss and arrested development when evaluating language functioning in L1. The importance of assessing the child's progress in acquiring English is also stressed. However, without adequate knowledge of normal strategies used by second language learners, evaluation in English will also be of limited usefulness.

One guideline offered to clinicians evaluating children who are acquiring English as a second language is to be aware of the possible effects of L1 on L2 (English). Phonologic, semantic, and syntactic features of L1 may be applied to English, resulting in patterns of errors typical of children from similar first language backgrounds. This process is called "transference." Several recent books and journals have supplied SLP's with a description of features from common first languages, such as Chinese and Spanish, that might be reflected in the English "errors" of second language learners (Cheng, 1987; Kayser, 1989; Lewis, Vang, and Cheng, 1989; Owens, 1992). The assumption is that such errors are a normal part of second language acquisition.

However, the importance of transference in the process of second language acquisition has been strongly debated in the literature. Some studies suggest that it accounts for very few of the errors seen in bilingual children. For example, Padilla and Lindholm (1984), in their review of numerous bilingual language acquisition studies, conclude that bilingual transference plays a minimal role in acquisition. Furthermore, a widely cited study by Dulay and Burt (1974) revealed that only 4.7% of the errors in young bilingual children's language samples could be accounted for by transference.

On the other hand, Hakuta (1986) suggests that the small number of errors found by Dulay and Burt (1974) was a function of their method of data analysis. Errors in that study were categorized as either "developmental" or "transference" errors. Hakuta (1986) points out that using this method, there were many more opportunities for developmental errors to occur than for transference errors to occur.

Opportunity for occurrence was controlled for in a study by Madrid and Garcia (1981). These authors used a structured task, rather than an open-ended language sample format, to examine the acquisition of one particular structure, the negative, in Spanish bilingual children. Furthermore, they applied a different criterion for transference than did Dulay and Burt (1984). Increased frequency of a particular type of error compared to monolingual children of the same age was inter-

preted as being a function of the influence of Spanish on English. Several types of errors were in fact exhibited more frequently by the Spanish-speaking children: omission of "do" support; omission of sentence subjects; and insertion of "no" preverbally. The authors suggested that the pattern was a function of exposure. Support for the role of transference also comes from examination of the acquisition patterns of specific forms in a study by Padilla (1978). He compared the order of acquisition of English morphemes in monolingual and bilingual Spanish children and concluded that overall there was little difference between the two groups. However, these structures did show later acquisition in the bilinguals: the possessive "s" and the prepositions "in" and "on." Padilla (1978) interpreted the later appearance of the possessive as possibly due to a lack of a congruent form for expressing possession in Spanish. The author further suggested that "in" and "on" may appear later because in Spanish, one word, "en," is used to mean both.

What emerges from these earlier studies is the need to examine the acquisition process of specific structures to determine what role, if any, transference plays in their acquisition of that structure. Such information would allow the clinician to determine more accurately if certain kinds of errors in the child's English are normally occurring for that structure or whether the child is experiencing English language acquisition problems that go beyond normal second language acquisition processes.

The present study compared bilinguals' and monolinguals' use of one structure, the adjective-noun phrase. The first question addressed was quantitative, that is, are bilingual Spanish children delayed relative to monolingual children in the use of this particular structure? The next questions were qualitative. Is there a difference in the kinds of errors the two groups make? If so, can these errors be attributed to transference?

METHODS

SUBJECTS

The experimental subjects were 20 bilingual children (10 kindergarten and 10 first grade) identified as bilingual by their classroom teachers and

by testing on the Basic Inventory of Natural Language (BINL; Herbert, 1979). The BINL requires children to tell a story about pictures. A Level of Complexity score is derived from a weighted scoring system which takes into account such features as sentence completeness, sentence complexity, and the number of phrases and modifiers. Bilingual children were tested in Spanish and English, and only subjects who scored a minimum score of 20 in both languages on the Level of Complexity Measure were included in the study. The Spanish portion of the test was administered by native Spanish speakers. Kindergarten children ranged in age from 5; 1 to 6; 3 (6 girls; 4 boys), and first grade children ranged from 6; 1 to 7; 4 (5 girls; 5 boys).

All subjects had been born in the United States to parents of Puerto Rican or Dominican Republic backgrounds. Examination of school records indicated that at least one parent conversed solely in Spanish with the child. Although the children had varying degrees of exposure to English in the pre-school years, Spanish was their dominant language upon entering kindergarten.

The control group consisted of 20 monolingual children in the same grades (10 kindergarten and 10 first grade) who were matched (subject-by-subject) to experimental subjects on the basis of teacher reports of academic achievement. The monolingual kindergarten children ranged in age from 5; 2 to 6; 2 (5 girls; 5 boys), and the first grade children ranged from 6; 2 to 7; 2 (6 girls; 4 boys). Both the bilinguals and monolinguals attended the same public school, located in a lower socio-economic neighborhood of New York City. Examination of school records indicated that all subjects had normal I.Q.'s, normal medical histories, and no reported speech, language, or hearing problems.

PROCEDURE

Adjective-noun phrases were elicited through the use of a barrier game (Muma, 1978). The game required the child to describe to the examiner which of a choice of felt body parts or clothing pieces to put on a clown. Eleven nouns, each with a choice of two adjectives, were elicited. For example, the child might choose open or closed eyes; big or small ears; red or blue shoes. (See Appendix for a list of the stimuli.) The target utterance type was "Put the open mouth on the clown." Children were given two trial items to be sure they understood the game. The instructions in English were as follows:

"Today you and I are going to play a game. We're each going to make a clown with these pieces. First, let's see if you know what each piece is."

(Examiner names each noun and child points to it. Examiner then names each adjective and child points to it. At no time is an adjective-noun phrase modeled for the child).

"Look, we have the same kind of pieces. I want my clown to look like your clown. But I won't be able to see your clown. There will be a wall between us, see? (screen is put up).

So, you put a piece on your clown and then tell me which one I should put on. At the end we'll see if they match."

During the actual testing if a child gave an incomplete response such as "the shoes," or "put the red ones," the examiner probed with questions such as "which?" or "tell me more," in order to obtain a complete noun phrase such as "the red shoes" or "put the red shoes." No more than one probe was given for each item. Therefore, the number of responses per child varied depending on how often probes were required. The total number of responses per child was between 11 and 22, and the analyses were based on percent correct or incorrect. The examiner coded children's responses on the same day of the testing.

The following types of responses were identified:

1. Correct response: The child used a complete noun-phrase with an appropriate adjective and noun. For example, the following answers were considered correct: "put the pink gloves" or "the dirty pants."
2. Incomplete noun-phrase: Saying only the noun ("put the mouth") or only the adjective ("put the open").
3. No plural: omitting the plural morpheme ("put the ear" instead of "put the ears").
4. No specific noun: using the pronoun "one" instead of the specific name of the item (for example, "put the big one").
5. Transference: This could only be coded in the bilingual children's responses. Two types of transference from Spanish to English were coded: a. word order (for example, "the nose square" instead of "the square nose") b. plural agreement (for example "the bigs ears" instead of "the big ears").

The responses given in English by four children were evaluated by the two investigators. The percent correct, types of errors, and types of transferences were compared. Consistency was 86%, 86%, 88% for these three variables, respectively.

RESULTS

Three analyses of the data were carried out:

- 1) the mean percent correct noun phrases, 2) the types of errors made, and 3) the percentage of transference errors.

1. Mean Percent Correct Noun Phrases. Table 1 presents the means and standard deviations of percent correct noun phrase structures obtained

by each of the four subject groups (kindergarten monolingual and bilingual, and first grade monolingual and bilingual) as well as the total score by grade and by language background.

The Mann Whitney-*U* nonparametric statistic was used to compare the groups (Siegel, 1956) since the frequency distributions of the percent correct scores were not normally distributed and the variances were heterogenous.

As seen in Table 1, monolingual children performed better than bilingual children both as a whole group and when broken down by grade level. The mean percent correct for all monolingual children was 87.50% compared to 67.91% correct for bilingual children ($U = 98.5, 311.5; p < .05$). A breakdown by grade reveals that the kindergarten bilingual group scored significantly lower ($M = 51.23\%$) than the kindergarten monolingual group ($M = 81.79\%$; $U = 20.5, 79.5; p < .05$). Also significant was the difference between the performance of the monolingual and bilingual first graders. Bilinguals received a mean percent correct of 84.58 and monolinguals a mean percent correct of 93.21 ($U = 25, 75; p < .05$).

Table 1 additionally reveals that first graders scored significantly better than kindergarten children (means of 88.9% and 66.51%, respectively) when data from monolingual and bilingual groups were combined ($U = 116.5, 283.5; p < .05$). Of interest is the fact that the improvement in first graders' score appeared to be a function of the better scores obtained by the bilingual children. While there was no significant difference between the monolingual kindergarten and first grade children ($U = 35, 65; p > .05$), bilingual children performed significantly better from kindergarten to first grade ($U = 17.5, 82.5; p < .05$).

2. Type of error. The mean percentages of three types of errors out of the total responses are presented in Table 2. Since the percentages of errors were relatively small, statistical comparisons were not made. It can be seen that both linguistic groups (monolingual and bilingual) had the greatest percentage of errors in the category of incomplete noun phrase. Furthermore, the percentage of incomplete noun phrases declined considerably from kindergarten to first grade. In this error category, as with all the data combined,

Table 1. Means and standard deviations of percent correct noun phrases in 20 monolingual and 20 bilingual children.

	MONOLINGUAL	BILINGUAL	TOTALS
KINDERGARTEN	M = 81.79 SD = 23.28	M = 51.23 SD = 31.74	M = 66.51 SD = 31.30
FIRST GRADE	M = 93.21 SD = 14.91	M = 84.58 SD = 11.74	M = 88.90 SD = 13.81
TOTALS	M = 87.50 SD = 19.91	M = 67.91 SD = 28.91	

monolinguals had fewer errors than bilinguals, particularly in kindergarten. As shown in Table 2, monolingual kindergarten children demonstrated an average of 7.63 percent incomplete noun-phrases in contrast with bilingual kindergarten children who scored 23.02 percent errors in this category. It should also be noted that bilingual kindergarten children demonstrated relatively high percentages of errors in the non-specific noun category (16.55%), whereas monolingual children rarely made this error. Again, this error type diminished considerably by first grade so that occurrence rates for bilingual and monolingual first graders differed minimally.

3. Transference. Transference errors were computed for bilingual children only. Transference occurred very infrequently in the kindergarten group (6 out of 139 responses which accounted for 3.5% of the total responses; 7.25% of the errors) and not at all in the first grade. An examination of the breakdown of the two types of errors revealed that word order transference was as frequent (3 out of 6 errors) as plural transference (3 out of 6 errors).

DISCUSSION

In answer to the question of whether exposure to a bilingual environment delays use of the adjective-noun phrase in English, results of this study reveal that performance was delayed by about one year relative to the monolingual children. Bilingual first graders were functioning at approximately the same level as the monolingual kindergarten children. However, unlike the monolingual children, bilingual children showed significant growth from kindergarten to first grade. Assuming that this trend continues, bilinguals' functioning would be comparable to monolinguals' in a short time. This assumption is justified by the fact that the monolingual children had reached a ceiling in their ability to use this structure. The morphological, syntactic and pragmatic skills necessary to complete this task were essentially complete by kindergarten, with insignificant gains made by monolingual first graders.

These results are in agreement with results of a receptive study by Carrow (1972) comparing monolinguals and bilingual, ages 3;10 to 6;9. Carrow also found poorer English functioning by the younger bilingual with gradual progress leading to no difference between the oldest groups.

The second question addressed the issue of qualitative differences. Did the kinds of errors made by the bilingual and monolinguals differ? The answer to that question is for the most part, no. In both groups, the most common error was an incomplete noun-phrase, that is, omission of either the noun or adjective. These errors declined in both groups from kindergarten to first grade, indicating that a similar development process was occurring for both monolinguals and bilingual. However, bilingual kindergarten children did demonstrate much greater usage of a non-specific noun (e.g., "the big one"). An examination of the data suggested that this was a strategy specific to particular children.

The striking difference between the bilingual and monolinguals in the percentage of incomplete adjective noun-phrases and usage of non-specific nouns in kindergarten should receive further comment. Whereas monolingual first graders were capable of producing descriptive utterances as "put the big round nose" or "put the green, clean shirt," bilinguals exhibited severely reduced constructions such as "the round," "the nose," "put the small one." The inability to produce more complete constructions appeared not to be simply a function of lack of knowledge of the required label, since the missing labels were often used in other utterances. Rather, what may have occurred was a breakdown in production due to the simultaneous syntactic, semantic, and possible pragmatic demands of the task, a process similar to what is described by Bloom, Miller and Hood (1975) in their article on variation and reduction in utterance length in young children. That research demonstrated that utterance length may be a function of a number of factors including context, discourse interactions, and degree of familiarity with lexical items. The authors pointed out that "knowing" a word involves more than demonstrating correct use in one particular context.

The final issue addressed by this study was the degree to which transference affected the bilingual children's English development. As stated previously, transference errors occurred only in bilingual kindergarten children and accounted for only 4.32% of the total responses which equals 7.25% of the total number of errors. These results are only slightly higher than Dulay and Burt's (1974) finding that transference accounted for 4.7% of the total number of errors. It would appear then, that exposure to English in school for only one year may be sufficient for young Spanish speaking children to acquire the correct morphological and syntactic rules for the adjective-noun phrase in English. Furthermore, even in the earliest stages, transference errors will be uncommon. Therefore, continued use or more frequent use of Spanish word order or adjective-noun agreement might be a warning sign to clinicians of a true language disorder. Further research with a larger sample of children and a greater variety of combinations of adjective-noun phrases will be necessary to confirm this conclusion.

However, in order to make truly informed judgments, clinicians should be aware of some other fac-

tors which may determine the frequency of appearance of transference errors. For example, Hakuta (1986) suggests that the degree to which transference is utilized, and the kinds transference errors seen, may be a function of individual strategies. In other words, particular individuals may utilize transference to a greater or lesser extent and with different structures. Hakuta (1986) further states that transference should be examined in terms of the sociolinguistic context in which the second language is learned. The effect of sociolinguistic context on the frequency of transference was illustrated in a study by Selinker, Swain, and Dumas (1975) who found numerous transference errors in the speech of English speaking Canadian children in a French immersion program. These children were not interacting with any native speakers of French and therefore, use of English rules, such as those for word order, may have been more acceptable in that environment. The children in the present study on the other hand, were interacting with native American English speaking peers. It appears then that a number of factors might influence the strength of interference in bilingual language acquisition, and that all of these factors needs fuller examination.

In conclusion, results of this study suggest that although exposure to both Spanish and English may initially limit use of the adjective-noun phrase in English, this condition is likely only to be temporary. For the most part, the kinds of errors the bilingual children made were no different than those made by the monolingual children, with transference accounting for only a small percentage of the errors on this structure. Professionals responsible for evaluating the language functions of bilingual children should, therefore, be wary of persistent transference errors on the adjective-noun phrase beyond the earliest stages of acquisition. However, only research on transference in language impaired bilingual children would confirm the notion that persistent transference on this structure is indeed a sign of language impairment. Furthermore, as mentioned previously, it must be kept in mind that individual strategies and sociolinguistic context may affect the degree to which transference is utilized. Future research should explore these factors as well as the English acquisition of specific phonologic, syntactic, and morphologic structures by bilingual children.

Table 2. Mean percentage of three kinds of errors in monolingual and bilingual kindergarten and first grade children. (The actual number of errors and the total responses are presented in parenthesis.)

	MONOLINGUAL	BILINGUAL
INCOMPLETE NOUN PHRASE		
KINDERGARTEN	7.63 (9 out of 118)	23.02 (32 out of 139)
FIRST GRADE	4.35 (5 out of 115)	5.74 (7 out of 122)
NO PLURAL		
KINDERGARTEN	3.39 (4 out of 118)	7.19 (10 out of 139)
FIRST GRADE	1.74 (2 out of 115)	4.10 (5 out of 122)
NON-SPECIFIC NOUN		
KINDERGARTEN	5.08 (6 out of 118)	16.55 (23 out of 139)
FIRST GRADE	1.74 (2 out of 115)	3.28 (4 out of 122)

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APPENDIX

Noun phrase combinations that could be used by children in the clown-barrier game:

big or little hat
blue or brown eyes
round or square nose
little or big ears
closed or open mouth
long or short (big-little) tie
clean or dirty shirt
yellow or pink gloves
clean or dirty pants
red or yellow buttons
red or blue shoes



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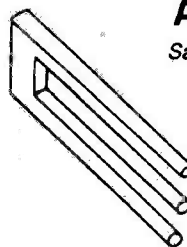


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Bone Conduction Reconsidered

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ABSTRACT

The conclusion is drawn that a desirable way to minimize some of the confounding effects of the outer and middle ear during bone-conduction testing is to place the vibrator on the forehead rather than the mastoid process. This technique has been recommended for some time, but apparently is used by few clinicians. For those who wish to use mastoid placement, a procedure is suggested whereby the vibrator and masking transducer are both placed on the side of the head opposite the cochlea to be tested when masking is required.

OBSERVATIONS

Surveys of audiometric practice over more than two decades reveal a trend that shows as interest increases in technology-based clinical activities, less attention is directed to the practical day-to-day responsibilities involved with diagnostic audiometry (Martin & Pennington, 1971; Martin & Pennington, 1972; Martin & Forbis, 1978; Martin & Morris, 1989; Martin & Gravel, 1989; Martin, Armstrong, & Champlin, 1994.) Most, if not all audiologists would agree that without careful attention to the fundamental tests in the battery, reasonable diagnostic conclusions cannot be drawn. The mechanisms underlying the bone-conduction (BC) response are not well understood, and the test protocol for such testing may vary greatly among clinics and clinicians. Consequently, the interpretation of BC test results may suffer from the lack of standardization. The notion that has traditionally been promulgated about pure-tone audiometry is that air-conduction (AC) thresholds indicate the amount of hearing loss present at a given frequency, BC thresholds show the amount of sensorineural sensitivity (cochlear reserve), and that the arithmetic differences at each frequency (the air-bone gaps [ABG]) show the conductive component. Although this oversimplification suffices when introducing students to the measurement of hearing, there is evidence that audiologists practicing in the field may not have an appreciation for the complexity of measuring hearing by bone conduction. Despite attempts to find alternatives, such as the sensori-neural acuity level test (Jerger & Tillman, 1960), evidence abounds that BC testing is here to stay.

During BC testing the entire skull is stimulated, causing it to vibrate in a relatively uniform, albeit frequency-dependent manner. Although the vibratory pattern of the skull was demonstrated some 50 years ago (see Bekesy, 1960), and the influence of the middle ear system more than 25

years ago (Tonndorf, 1966), the relationship between the physiology underlying the response to BC signals and the accurate measurement of that response has long been considered tenuous. Consequently, the substantial intersubject variability and poor test-retest reliability of behavioral BC thresholds continue to be of clinical concern. Dirks (1971) described the clinical utility of BC testing as "essential," yet "widely mistrusted" (p. 142). Part of the "mistrust" no doubt arises from the numerous confounding variables associated with the skull's response to vibratory stimuli, as well as the conductive system's unwanted contributions to hearing by BC.

A review of the mechanisms contributing to the BC response (Tonndorf, 1972) indicates that each cochlea is not stimulated in isolation when the skull is vibrated. Tonndorf describes a BC stimulus as affecting the inner, middle and outer ear in the following ways:

- (1) A *distortional* mode, in which the shape of the cochlear capsule changes "in synchrony" (Tonndorf, 1972, p. 212) with the applied BC force. As the walls of the cochlea deform, the fluids are displaced and the hair cells are sheared. This may be (naively) considered the only mode of hearing via BC, but in reality BC is much more complicated.
- (2) A *middle ear inertial* mode, in which the mass of the ossicles causes them to lag behind the movement of the skull around the oval window. BC stimulation, in this case, creates oval window movement relative to the stapes, just the opposite of what takes place during AC. That is, the bony capsule containing the oval window is displaced laterally or medially prior to movement of the stapes. After ossicular inertia is overcome the stapes begins to move, out of phase at first, but eventually in phase with the bone surrounding the oval window.
- (3) An *osseotympanic* mode of BC in which the bony and cartilaginous portions of the external auditory canal (EAC) vibrate because they are part of the skull. Because the unoccluded outer ear acts primarily as a high-pass filter, Tonndorf suggests that some of this acoustic energy, primarily in the high frequencies, is "taken up" (p. 212) by the cochlea. Both the inertial and osseotympanic modes have their primary effects in the low frequencies.

When the EAC is occluded, low-frequency energy that is not initially received by the cochlea cannot exit the EAC opening. The result may be an increased amount of low-frequency energy reaching the cochlea. This phenomenon creates the "occlusion effect," which influences the perception of low-frequency, BC sounds in normal hearers and persons with sensorineural hearing

loss (e.g., Dirks, 1985). The occlusion effect is diminished when insert earphones are used in place of supraural earphones, in part because they reduce the increase in sound pressure level (SPL) generated by osseotympanic stimulation.

Fagelson and Martin (1994) measured SPLs in the EACs of subjects with normal middle-ear function and normal auditory sensitivity at 500, 1000, 2000 and 4000 Hz (Table 1). These SPLs were the result of BC stimulation with the oscillator placed alternately on the forehead and the right mastoid process. In the higher frequencies, significantly higher SPLs were measured in both the ipsilateral and contralateral EACs when the head was stimulated from the mastoid. Ipsilateral mastoid EAC SPLs were higher than either EAC SPL observed during forehead testing. When SPLs were compared between right and left EACs, forehead placement of the oscillator produced no interaural differences, while mastoid placement resulted in significantly greater EAC SPLs ipsilateral to the oscillator at 2000 and 4000 Hz. Forehead and mastoid placements produced nearly identical SPLs in subjects' EACs in the ear contralateral to the stimulated mastoid process at 2000 and 4000 Hz. These findings corroborated data gathered in earlier investigations (see Silman & Silverman, 1991 for review), indicating that BC testing from the mastoid at high frequencies may also be confounded by air-borne acoustic energy radiated from the BC vibrator.

Table 1: Differences in sound pressure level developed in the right (ipsilateral) EAC and the left (contralateral) EAC with the bone-conduction vibrator placed on the right mastoid process. (Adapted from Fagelson and Martin, 1994)

Frequency (Hz)	500	1000	2000	4000
Difference (in dB)	0.57	0.14	8.8	18.8

Fagelson and Martin (1994) interpreted their data as further evidence that forehead vibrator placement during BC audiometry lessens the osseotympanic mode's effect. Their conclusions regarding EAC SPL support previously reported data indicating the forehead is the preferred BC vibrator placement site. Advantages associated with forehead placement include improved inter-subject and intrasubject reliability, a lessening of the effects of the middle ear (the inertial effect), and the observation that variations in vibrator-to-skull pressure produce fewer artifacts when the forehead is stimulated. Other than the mistaken

notion that placing the vibrator behind an ear somehow assures that the ipsilateral cochlea will be the one to respond, the mastoid's sole advantage is that thresholds are lower than when measured from the forehead by the following amounts (ANSI, 1992):

Frequency (Hz)	250	500	1000	2000	4000
Intensity (dB)	12.0	14.0	8.5	11.5	8.0

The increase in the dynamic range of testing BC from the mastoid is indeed valuable, especially when testing patients whose BC thresholds approach the output limits of the audiometer. Of course it is possible to keep corrections at hand so that either forehead or mastoid placement can be selected according to individual needs.

C ONCLUSION

It is clear from a number of studies that most clinicians continue to conduct BC measurements with the vibrator on the mastoid. Ironically, if the mastoid is the test site, the best way to minimize outer- and middle-ear effects above 1000 Hz is to place the vibrator on the mastoid **opposite** the cochlea to be tested, and to mask the non-test ear.

Stated differently, to test the right ear by BC, the vibrator should be placed behind the left ear and the masking transducer applied to the left ear to eliminate it from the test. Although this may appear fatuous on first thought, considering the fact that interaural attenuation for BC is expected to be about zero dB, it may be the best way to minimize EAC effects for those who wish to use mastoid placement. These conclusions lend further credence to the selection of the forehead as the preferred site for BC testing.

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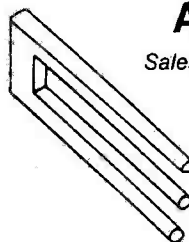
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Audiologists and speech-language pathologists are finding new words in their vocabulary: report cards, benchmarking, cost effectiveness, functional outcomes. We are now being asked very different questions by administrators, managed care companies and

sometimes our patients. We are being asked to prove not only that our services provide a benefit to our patients, but also that the benefit is achieved in the most cost effective way.

ASHA recognized the pressing need for answers to such questions when it formed the Task Force on Treatment Outcome and Cost Effectiveness in October of 1993. The Task Force was charged with generating an outcome database for the professions. The rationale for establishing the task force was that changes in the marketplace related to health care reform were rapidly creating service delivery changes and restrictions in service delivery models, and in length and duration of treatment. There was a need for the professions to collect, maintain, and generate reports from a structured national database system.

ASHA members have responded positively to the activities and recommendations of the Task Force, recognizing that the need for outcome data affects speech-language pathologists and audiologists in every work setting. The initial demands for the data have been in the health care arena, but members who work in school settings are also being asked similar questions about the functional outcome of services provided.

Initially the Task Force obtained data that were currently available and analyzed it to see if it was useful. The Task Force retrieved outcome data available in existing national data bases, including the Functional Independence Measure (FIM) and the LORS-III (Lors American Data System). These two systems are used primarily in in-patient rehabilitation settings. Those who use these tools know that the sections on communication are very limited. The Task Force contracted with Formations in Health Care, Inc. to analyze the data from these nationally aggregated databases and provide examples of the types of information

that could be obtained. The results were promising in terms of showing functional changes as the result of intervention.

The Task Force was contacted by nearly 100 people or programs in 33 states, reporting on their data collection efforts. Some members have been collecting such data for some time. Five sites were selected and their data were forwarded to Evaluation Systems International, Inc. for analysis via a software package they have developed. This analysis provided other good examples of the kind of information that can be obtained when outcome data is collected.

Recognizing the limitations of the currently available data, the Task Force has proceeded with the development of a data collection tool, which may form the basis of a national outcome management system. A paper and pencil tool was developed and distributed at convention. Over 200 members expressed interest in serving as test sites for the tool, and 15 sites have been selected for the pilot. These sites were chosen so that data could be collected in a variety of settings, across age ranges, and with clients presenting with various disorders of communication and swallowing. Training is currently occurring and data collection will begin in April. These pilot sites will provide feedback that will help modify the tool. The Task Force continues to study how the data collected might be analyzed and reported so it could be used easily by members.

The tool collects information about the demographics of the patient, the type and length of treatment provided, whether short term goals were met, if the patient showed a change in functional status and if the patient was satisfied with the services provided. The tool utilizes a rating scale, the Functional Communication Measure, originally developed as part of the Program Evaluation System (PES). The tool will need to be enhanced and modified so that it can be used to collect data on audiology services, services for pediatrics and in school settings. Members with expertise in those areas will serve as consultants to the Task Force as these changes are made.

Other exciting aspects of the Task Force's activity will be the formation of clinician-researcher pairs and cooperative projects. The clinician-researcher pairs will help gather outcome and efficacy data in areas where information is currently not available. The association hopes to

be able to work cooperatively with others (e.g., Special Interest Divisions, allied and related professional organizations, agencies) to obtain additional data.

The Task Force also recognized that our members needed information on working in a managed care environment. It is sponsoring six workshops around the country, entitled "Meeting the Managed Care Challenge." The first workshop was held in January in Los Angeles and the next workshops are in Atlanta (March 10-11), Chicago (April 7-8), Washington (May 5-6), Boston (July 7-8) and Denver (August 18-19). The workshop topics include marketing to managed care, managed care contracting, what managed care organizations are looking for, and strategies for work place and health care reform.

This year the Task Force continues its activities on all of the above, and concentrates efforts on collecting outcome information in the areas of audiology, pediatrics, and school based services. ASHA has made a commitment of time, energy and dollars to continue the project to get the information its members need to practice in a changing environment. The members have demonstrated their enthusiasm for the project. If everyone continues to work together, our professions will have the information they need to answer the tough questions.

For more information on the activities of the Task Force, contact Peg Williams, Deputy Executive Director of ASHA; for information on the paper and pencil tool, contact Herb Baum in the Research Division; for information on the workshops, contact Griffin Management, Inc. (602) 922-0622.

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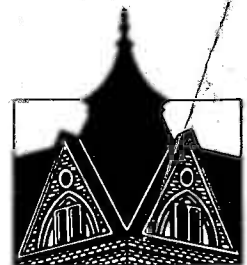
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